DOCUMENTED HISTORICAL LANDSLIDE DAMS FROM AROUND THE WORLD

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

OPEN-FILE REPORT 91-239

Cover: *Rock slide caused by Cyclone Bola, March 1988, blocking the Hangaroa River, Waerengaokuri, North Island, New Zealand. Photo by Noel Trustrum, Division of Land and Soil Sciences, Palmerston, New Zealand*

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by

John E. Costa and Robert L. Schuster

U.S. Geological Survey

Open-File Report 91-239

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U.S. DEPARTMENT OF THE INTERIOR

MANUEL LUJAN, JR., Secretary

U.S. GEOLOGICAL SURVEY

Dallas L. Peck, *Director*

For additional information
write to:

U.S. Geological Survey
Cascades Volcano Observatory
5400 MacArthur Boulevard
Vancouver, WA 98661

Copies of this report may be
purchased from:

U.S. Geological Survey
National Landslide Information Center
Box 25046, Mail Stop 966
Denver Federal Center
Golden, CO 80225

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CONVERSION FACTORS AND ABBREVIATIONS

Multiply	by	To obtain
millimeter (mm)	25.4	inches (in.)
meter (m)	0.3048	foot (ft)
kilometer (km)	1.609	mile (mi)
meter^2 (m^2)	0.0929	foot^2 (ft^2)
kilometer^2 (km^2)	2.59	mile^2 (mi^2)
meter^3 (m^3)	0.02832	foot^3 (ft^3)
meter^3 per second (m^3/s)	0.02832	foot^3 per second (ft^3/s)

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U.S. Geological Survey
Denver, CO 80225

ABSTRACT

This data compilation consists of dBase IV[1] data files of the location, date, triggering mechanism, kind, size, failure time and mechanism, breach dimensions, subsequent controls, materials, and references for 463 historical landslide dams and associated natural reservoirs that have been recorded throughout the World.

INTRODUCTION

The data base presented in this report is a compilation of information on the characteristics of 463 landslide dams from around the World. It forms a basis on which to assess potential threats from existing landslide dams, or newly-formed landslide dams. The data base includes only landslide dams that have formed in historical times - that is, those formed during times when humans were able to record their occurrence, and the information transferred through various means of written and/or oral documentation. There have been far more prehistoric landslide dams about which relatively little is known. None of these is included in this data base. The focus on historical landslide dams allows insights into this natural process that will aid in understanding their role as a significant geologic process in recent Earth history.

Thousands of landslide dams have formed all over the world during recorded history. This data base is not comprehensive nor exhaustive. It does, however, include the majority of historical landslide dams whose formation was recorded and for which appropriate documentation is available. It is frequently impossible to give the dimensions of old dams or their impounded lakes with any certainty, and published data often differ from one source to another. Wherever possible the dimensions of the dams and lakes were field checked, but otherwise it has been necessary to use judgement in assessing which figures to quote. There is still room for correction or interpretation of available data, and the nature of the data base is to allow for necessary corrections.

[1] The use of brand or product names in this report is for identification purposes only and does not constitute endorsement by the U.S. Geological Survey.

The data base is biased toward particular parts of the World where there is a long historical record, where knowledgeable colleagues live, or where the phenomenon of landslide damming has been investigated locally. Thus, many of the data come from the European Alps, Japan, China, and North America.

Undoubtedly more cases exist and will be discovered by those interested in the topic. Other new cases will occur because damming of rivers by landslides is an active, ongoing process. The data base will be updated periodically as new information becomes available. This report represents data acquired through June, 1991.

The data base in stored in dBase IV format, and the introductory text, individual landslide dam cases, and reference list are in ASCII format. Copies of the database files, and text and data, are available on one 3.5-inch high-density disk, at cost, from the U.S. Geological Survey, National Landslide Information Center (NLIC), Box 25046, Mail Stop 966, Golden, Colorado, 80225. Future changes in the data base will be handled through the NLIC. Errors, corrections, additions, deletions, and other adjustments to the data base should be reported or recommended to the NLIC.

DATA ORGANIZATION

For each landslide dam, data are included on geography, type, cause and size of landslide, dam dimensions and materials, lake dimensions, failure information, and appropriate references and comments. Few individual cases include all of these categories of information. Where no specific information was available, a question mark (?) is used. Where the entry is not applicable (for example, time to failure of a landslide dam that has not failed), a dash (-) is used. The major headings (information categories) in the data base are described below:

Country - Name of the country in which the landslide dam formed, as listed by the U.S. Board of Geographic Names or included in The Times ***Atlas of the World***, 7th edition, 1988.

Subdivision - Name of the local political unit in which the landslide dam formed, as listed in The Times ***Atlas of the World***, 7th edition, 1988.

Date of dam - Year, month, and day on which the landslide dam was formed. Dates Before Christ (B.C.) are listed with a minus (-) sign in front of the year. Unknown year, month, or day are represented by (?).

River or lake - Geographic name of the river that was dammed by the landslide, and the name of the resulting lake, if available, as listed by the U.S. Board of Geographic Names or included in The Times ***Atlas of the World***, 7th edition, 1988. Many of the lakes have been given informal local names because they were new or temporary features not listed in these references and not noted on available maps.

Type of landslide - Type of landslide according to the classification of Varnes (1978). The basic movement process is listed first, followed by a descriptor that usually indicates some material property, for example, "slump, earth". Many landslides transform after they detach. If the type of landslide that originally formed is known, and the type of landslide that ultimately formed the dam is also known, they are given in this order and separated by a forward-slash (/), for example, "avalanche, rock/slide, debris". If only one kind of landslide is listed, it is the mass movement that actually formed the dam.

Trigger - Mechanism that caused initial landslide.

Landslide volume - Total volume of the initial landslide, in cubic meters.

Dam type - Type of landslide dam, based on morphological relationship with the valley floor, using the classification of Costa and Schuster (1988).

Dam height - Vertical altitude difference from the valley floor to the lowest point on the landslide dam (point of overflow in event of overtopping), in meters.

Dam length - Crest length of the landslide dam measured perpendicular to the major valley axis, in meters.

Dam width - Base width of the landslide dam measured parallel to the main valley axis, in meters.

Lake length - Length of backwater ponded behind landslide dam, measured upstream from dam, in meters.

Lake volume - Volume of water ponded behind landslide dam (usually maximum volume), in cubic meters.

Time to failure - Elapsed time from initial formation of landslide dam until failure of the dam, in days. In some cases time to failure is a qualitative statement, for example, "In a short time."

Failure mechanism - Physical process that led to complete or partial breaching of the landslide dam and draining of the lake.

Breach dimensions - Geometry of the breach eroded into the landslide dam. This is an important component for dam-break modeling. These data are scarce for landslide dam failures.

Controls - Any physical modifications made to the landslide dam to help minimize volume of impounded water, artificially lower height, change the geometry of dam, or prevent erosion upon overtopping.

Dam materials - General type of material that constitutes the landslide dam.

References - Sources of information about individual landslide dams.

Comments - General information about effects of the landslide or dam failure.

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Tables 1 - 463. Locations, characteristics, and dimensions of documented historical landslide dams from around the World.

07/15/91

COUNTRY: Afghanistan

SUBDIVISION: Bamiyan Province, Ajar Valley

DATE: 1960's (early)

RIVER OR LAKE: Ajar River; Chiltan Lake

TYPE OF LANDSLIDE: Fall, rock

TRIGGER: Earthquake

LANDSLIDE VOLUME (m^3): ?

DAM TYPE: ?

DAM HEIGHT (m): ?

DAM LENGTH (m): ?

DAM WIDTH (m): ?

LAKE LENGTH (m): ?

LAKE VOLUME (m^3): ?

TIME TO FAILURE (days): Did not fail.

FAILURE MECHANISM: -

BREACH DIMENSIONS: -

CONTROLS: -

DAM MATERIALS: Many rock blocks.

REFERENCES: Shank and others, 1977.

COMMENTS: Good cover photo on report; many rock blocks in landslide. Undoubtedly resistant to erosion.

07/15/91

COUNTRY: Australia

SUBDIVISION: Victoria State, Otway Shire

DATE: 1952; 6/23

RIVER OR LAKE: E Branch Barwon River; Lake Elizabeth

TYPE OF LANDSLIDE: Slide, rock

TRIGGER: Rainfall (280-560 mm in preceeding 2-3 weeks).

LANDSLIDE VOLUME (m^3): 6,000,000

DAM TYPE: II

DAM HEIGHT (m): 36

DAM LENGTH (m): ?

DAM WIDTH (m): ?

LAKE LENGTH (m): 1,600

LAKE VOLUME (m^3): ?

TIME TO FAILURE (days): 414

FAILURE MECHANISM: Overtopping

BREACH DIMENSIONS: ?

CONTROLS: -

DAM MATERIALS: Cretaceous sandstone and shale.

REFERENCES: Currey, 1952; Rosengren, 1984.

COMMENTS: Lake overtopped dam on 8/8/52. On 8/5/53, following heavy rain, top 26 m of dam breached.

07/15/91

COUNTRY: Austria

SUBDIVISION: Carinthia Province, Gail Valley, Reisskofel Mts.

DATE: 328

RIVER OR LAKE: Gail River

TYPE OF LANDSLIDE: Flow, debris

TRIGGER: Rainfall

LANDSLIDE VOLUME (m^3): ?

DAM TYPE: ?

DAM HEIGHT (m): ?

DAM LENGTH (m): ?

DAM WIDTH (m): ?

LAKE LENGTH (m): ?

LAKE VOLUME (m^3): ?

TIME TO FAILURE (days): ?

FAILURE MECHANISM: ?

BREACH DIMENSIONS: ?

CONTROLS: -

DAM MATERIALS: Carbonate debris.

REFERENCES: Eisbacher and Clague, 1984, p. 76.

COMMENTS: Earthquake shattered parts of Reisskofel, followed by rainstorm-mobilized debris flow.

07/15/91

COUNTRY: Austria

SUBDIVISION: Carinthia Province, Gail Valley, Villach, Dobratsch

DATE: 1348; 1/25

RIVER OR LAKE: Gail River

TYPE OF LANDSLIDE: Avalanche, rock

TRIGGER: Earthquake

LANDSLIDE VOLUME (m^3): 30,000,000

DAM TYPE: ?

DAM HEIGHT (m): ?

DAM LENGTH (m): ?

DAM WIDTH (m): ?

LAKE LENGTH (m): ?

LAKE VOLUME (m^3): ?

TIME TO FAILURE (days): Several days.

FAILURE MECHANISM: ?

BREACH DIMENSIONS: ?

CONTROLS: -

DAM MATERIALS: Carbonate rubble.

REFERENCES: Montandon, 1933; Eisbacher and Clague, 1984, p. 89-90.

COMMENTS: Flooded several hamlets upstream from dam.

07/15/91

COUNTRY: Austria

SUBDIVISION: Carinthia Province, Lavant Valley, Gemmersdorf

DATE: 1660; 6/7

RIVER OR LAKE: Lavant Valley

TYPE OF LANDSLIDE: Flow, debris

TRIGGER: Rainfall

LANDSLIDE VOLUME (m^3): ?

DAM TYPE: ?

DAM HEIGHT (m): ?

DAM LENGTH (m): ?

DAM WIDTH (m): ?

LAKE LENGTH (m): ?

LAKE VOLUME (m^3): ?

TIME TO FAILURE (days): ?

FAILURE MECHANISM: ?

BREACH DIMENSIONS: ?

CONTROLS: -

DAM MATERIALS: Metamorphic rock debris.

REFERENCES: Eisbacher and Clague, 1984, p. 125.

COMMENTS: Failure of debris dam killed 29.

07/15/91

COUNTRY: Austria

SUBDIVISION: Carinthia Province, Obervellach-Moll Valley

DATE: 1827; 5/?

RIVER OR LAKE: Moll River; Lake Gossnitzsee

TYPE OF LANDSLIDE: Flow, debris

TRIGGER: Rainfall and snowmelt

LANDSLIDE VOLUME (m^3): ?

DAM TYPE: ?

DAM HEIGHT (m): ?

DAM LENGTH (m): ?

DAM WIDTH (m): ?

LAKE LENGTH (m): ?

LAKE VOLUME (m^3): ?

TIME TO FAILURE (days): ?

FAILURE MECHANISM: ?

BREACH DIMENSIONS: ?

CONTROLS: -

DAM MATERIALS: Low-grade metamorphic debris.

REFERENCES: Eisbacher and Clague, 1984, p. 165-166.

COMMENTS: Dam created shallow lake; bursts from lake continued for years, lake still there.

07/15/91

COUNTRY: Austria

SUBDIVISION: Salzburg Province, Salzach Valley, Embach

DATE: 1794; spring

RIVER OR LAKE: Salzach River

TYPE OF LANDSLIDE: Flow, earth

TRIGGER: ?

LANDSLIDE VOLUME (m^3): ?

DAM TYPE: ?

DAM HEIGHT (m): ?

DAM LENGTH (m): ?

DAM WIDTH (m): ?

LAKE LENGTH (m): 3,000

LAKE VOLUME (m^3): ?

TIME TO FAILURE (days): Several years.

FAILURE MECHANISM: ?

BREACH DIMENSIONS: ?

CONTROLS: -

DAM MATERIALS: Gravel, clay, moraine, sand, and phyllitic bedrock debris.

REFERENCES: Montandon, 1933; Eisbacher and Clague, 1984, p. 152.

COMMENTS: -

07/15/91

COUNTRY: Austria

SUBDIVISION: Salzburg Province, Salzach Valley, Niedernsill

DATE: 1798; 8/5

RIVER OR LAKE: Muhlbach Torrent

TYPE OF LANDSLIDE: Flow, debris

TRIGGER: Rainfall

LANDSLIDE VOLUME (m^3): ?

DAM TYPE: ?

DAM HEIGHT (m): 20 - 30

DAM LENGTH (m): ?

DAM WIDTH (m): ?

LAKE LENGTH (m): ?

LAKE VOLUME (m^3): ?

TIME TO FAILURE (days): ?

FAILURE MECHANISM: ?

BREACH DIMENSIONS: ?

CONTROLS: -

DAM MATERIALS: Low-grade metamorphic debris.

REFERENCES: Eisbacher and Clague, 1984, p. 153.

COMMENTS: Oversaturated plug of debris failed causing massive debris flow downstream; debris from Bombach Torrent dammed Muhlbach Torrent.

07/15/91

COUNTRY: Austria

SUBDIVISION: Salzburg Province, Salzach Valley, Werfen

DATE: 1947; 7/4

RIVER OR LAKE: Salzach River

TYPE OF LANDSLIDE: Flow, debris

TRIGGER: Rainfall

LANDSLIDE VOLUME (m^3): 100,000 - 200,000

DAM TYPE: ?

DAM HEIGHT (m): 15

DAM LENGTH (m): ?

DAM WIDTH (m): ?

LAKE LENGTH (m): ?

LAKE VOLUME (m^3): ?

TIME TO FAILURE (days): 1 (few hours).

FAILURE MECHANISM: ?

BREACH DIMENSIONS: ?

CONTROLS: -

DAM MATERIALS: Carbonate rubble and trees; blocks several m diameter.

REFERENCES: Eisbacher and Clague, 1984, p. 205.

COMMENTS: Debris blocked Kammerloch Gorge; flood wave after failure demolished bridges and roads, two killed.

07/15/91

COUNTRY: Austria

SUBDIVISION: Steiermark Province, Palten Valley, Gaishorn

DATE: 1768

RIVER OR LAKE: Palten River

TYPE OF LANDSLIDE: Flow, debris

TRIGGER: Rainfall

LANDSLIDE VOLUME (m^3): ?

DAM TYPE: ?

DAM HEIGHT (m): ?

DAM LENGTH (m): ?

DAM WIDTH (m): ?

LAKE LENGTH (m): ?

LAKE VOLUME (m^3): ?

TIME TO FAILURE (days): ?

FAILURE MECHANISM: ?

BREACH DIMENSIONS: ?

CONTROLS: -

DAM MATERIALS: Phyllite-carbonate debris.

REFERENCES: Eisbacher and Clague, 1984, p. 146-147.

COMMENTS: -

07/15/91

COUNTRY: Austria

SUBDIVISION: Styria Province, Mur Valley

DATE: 1958; 8/12-14

RIVER OR LAKE: Mur River

TYPE OF LANDSLIDE: Flow, debris

TRIGGER: Rainfall

LANDSLIDE VOLUME (m^3): ?

DAM TYPE: ?

DAM HEIGHT (m): 30

DAM LENGTH (m): ?

DAM WIDTH (m): ?

LAKE LENGTH (m): ?

LAKE VOLUME (m^3): ?

TIME TO FAILURE (days): ?

FAILURE MECHANISM: ?

BREACH DIMENSIONS: ?

CONTROLS: -

DAM MATERIALS: Rock debris and logs.

REFERENCES: Eisbacher and Clague, 1984, p. 209-210.

COMMENTS: Dam failure killed 12; debris-log jams rose to heights of 30 m.

07/15/91

COUNTRY: Austria

SUBDIVISION: Tirol Province, Brixen Valley

DATE: 1946; 7/?

RIVER OR LAKE: Brixen Torrent

TYPE OF LANDSLIDE: Flow, debris

TRIGGER: Rainfall

LANDSLIDE VOLUME (m^3): ?

DAM TYPE: ?

DAM HEIGHT (m): ?

DAM LENGTH (m): ?

DAM WIDTH (m): ?

LAKE LENGTH (m): ?

LAKE VOLUME (m^3): ?

TIME TO FAILURE (days): ?

FAILURE MECHANISM: ?

BREACH DIMENSIONS: ?

CONTROLS: ?

DAM MATERIALS: ?

REFERENCES: Eisbacher and Clague, 1984, p. 124.

COMMENTS: Failure of dam claimed five lives.

07/15/91

COUNTRY: Austria

SUBDIVISION: Tirol Province, Velber Valley

DATE: 1495

RIVER OR LAKE: Velber Brook; Hintersee Lake

TYPE OF LANDSLIDE: ?

TRIGGER: Earthquake

LANDSLIDE VOLUME (m^3): ?

DAM TYPE: ?

DAM HEIGHT (m): ?

DAM LENGTH (m): ?

DAM WIDTH (m): ?

LAKE LENGTH (m): ?

LAKE VOLUME (m^3): ?

TIME TO FAILURE (days): Did not fail.

FAILURE MECHANISM: -

BREACH DIMENSIONS: -

CONTROLS: Probably too much coarse rock.

DAM MATERIALS: ?

REFERENCES: Montandon, 1933.

COMMENTS: -

07/15/91

COUNTRY: Austria

SUBDIVISION: Tirol Province, Ziller Valley

DATE: 1908; 7/29

RIVER OR LAKE: Ziller River

TYPE OF LANDSLIDE: Flow, debris

TRIGGER: Rainfall

LANDSLIDE VOLUME (m^3): 300,000

DAM TYPE: ?

DAM HEIGHT (m): ?

DAM LENGTH (m): ?

DAM WIDTH (m): ?

LAKE LENGTH (m): ?

LAKE VOLUME (m^3): ?

TIME TO FAILURE (days): ?

FAILURE MECHANISM: ?

BREACH DIMENSIONS: ?

CONTROLS: ?

DAM MATERIALS: ?

REFERENCES: Montandon, 1933.

COMMENTS: Because of damming, the Ziller River swept away its dike, causing severe flooding downstream.

07/15/91

COUNTRY: Austria

SUBDIVISION: Vorarlberg Province, Blundenz, Vandans

DATE: 1894; 5/29

RIVER OR LAKE: Ill River

TYPE OF LANDSLIDE: Flow, debris

TRIGGER: Rainfall

LANDSLIDE VOLUME (m^3): 2,000,000

DAM TYPE: ?

DAM HEIGHT (m): ?

DAM LENGTH (m): ?

DAM WIDTH (m): ?

LAKE LENGTH (m): ?

LAKE VOLUME (m^3): ?

TIME TO FAILURE (days): ?

FAILURE MECHANISM: ?

BREACH DIMENSIONS: ?

CONTROLS: -

DAM MATERIALS: Carbonate rock debris.

REFERENCES: Eisbacher and Clague, 1984, p. 197.

COMMENTS: "A lake which became an attraction throughout the summer eventually burst across the debris wedge and caused serious damage downstream."

07/15/91

COUNTRY: Canada

SUBDIVISION: Alberta Province, 12 km NE of Rycroft

DATE: 1990; 6/17

RIVER OR LAKE: Saddle River

TYPE OF LANDSLIDE: Slump, earth

TRIGGER: Rainfall

LANDSLIDE VOLUME (m^3): 15,000,000

DAM TYPE: VI

DAM HEIGHT (m): 20 - 30

DAM LENGTH (m): ?

DAM WIDTH (m): 800

LAKE LENGTH (m): ?

LAKE VOLUME (m^3): ?

TIME TO FAILURE (days): ?

FAILURE MECHANISM: ?

BREACH DIMENSIONS: ?

CONTROLS: ?

DAM MATERIALS: Glacial lacustrine silts, till, and upper Cretaceous silty mudstone.

REFERENCES: Cruden and others, in press; Cruden and Thomson, in press.

COMMENTS: This is the first historic landslide dam in the Interior Plains of Canada.

07/15/91

COUNTRY: Canada

SUBDIVISION: Alberta Province, Frank

DATE: 1903; 4/29

RIVER OR LAKE: Crowsnest River

TYPE OF LANDSLIDE: Slide, rock

TRIGGER: ?

LANDSLIDE VOLUME (m^3): 36,500,000

DAM TYPE: II

DAM HEIGHT (m): 10

DAM LENGTH (m): ?

DAM WIDTH (m): ?

LAKE LENGTH (m): ?

LAKE VOLUME (m^3): ?

TIME TO FAILURE (days): 1.5

FAILURE MECHANISM: Overtopping

BREACH DIMENSIONS: ?

CONTROLS: -

DAM MATERIALS: Mostly large limestone boulders.

REFERENCES: McConnell and Brock, 1904; Cruden and Beaty, 1987.

COMMENTS: -

07/15/91

COUNTRY: Canada

SUBDIVISION: British Columbia Province

DATE: 1971 - 1973

RIVER OR LAKE: Homathko River

TYPE OF LANDSLIDE: Flow, debris

TRIGGER: Dam failure

LANDSLIDE VOLUME (m^3): ?

DAM TYPE: III

DAM HEIGHT (m): 20

DAM LENGTH (m): ?

DAM WIDTH (m): ?

LAKE LENGTH (m): 1,000

LAKE VOLUME (m^3): ?

TIME TO FAILURE (days): ?

FAILURE MECHANISM: ?

BREACH DIMENSIONS: ?

CONTROLS: -

DAM MATERIALS: Sandy boulder-gravel.

REFERENCES: Clague and others, 1985.

COMMENTS: Homathko River was dammed by debris flow issuing from mouth of Klattasine Creek after moraine-dam failure.

07/15/91

COUNTRY: Canada

SUBDIVISION: British Columbia Province

DATE: 1958; 8/?

RIVER OR LAKE: Cheakamus River

TYPE OF LANDSLIDE: Flow, debris

TRIGGER: Rainfall

LANDSLIDE VOLUME (m^3): ?

DAM TYPE: ?

DAM HEIGHT (m): 5

DAM LENGTH (m): ?

DAM WIDTH (m): ?

LAKE LENGTH (m): ?

LAKE VOLUME (m^3): ?

TIME TO FAILURE (days): ?

FAILURE MECHANISM: ?

BREACH DIMENSIONS: ?

CONTROLS: ?

DAM MATERIALS: ?

REFERENCES: Evans, 1986.

COMMENTS: -

07/15/91

COUNTRY: Canada

SUBDIVISION: British Columbia Province

DATE: 1963; 7/?

RIVER OR LAKE: Dusty Creek

TYPE OF LANDSLIDE: Avalanche, debris

TRIGGER: Progressive weakening

LANDSLIDE VOLUME (m^3): 5,000,000

DAM TYPE: ?

DAM HEIGHT (m): ?

DAM LENGTH (m): ?

DAM WIDTH (m): ?

LAKE LENGTH (m): ?

LAKE VOLUME (m^3): ?

TIME TO FAILURE (days): ?

FAILURE MECHANISM: Overtopping

BREACH DIMENSIONS: ?

CONTROLS: -

DAM MATERIALS: Dacite and poorly consolidated pyroclastic rocks.

REFERENCES: Clague and Souther, 1982.

COMMENTS: -

07/15/91

COUNTRY: Canada

SUBDIVISION: British Columbia Province

DATE: 1963; 7/?

RIVER OR LAKE: Turbid Creek

TYPE OF LANDSLIDE: Avalanche, debris

TRIGGER: Progressive weakening

LANDSLIDE VOLUME (m^3): 5,000,000

DAM TYPE: ?

DAM HEIGHT (m): ?

DAM LENGTH (m): ?

DAM WIDTH (m): ?

LAKE LENGTH (m): ?

LAKE VOLUME (m^3): ?

TIME TO FAILURE (days): ?

FAILURE MECHANISM: Overtopping

BREACH DIMENSIONS: ?

CONTROLS: -

DAM MATERIALS: Dacite and poorly consolidated pyroclastic rocks.

REFERENCES: Clague and Souther, 1982; Jordan, 1987.

COMMENTS: Other debris flows in 1984; surges blocked Squamish River very briefly. Changed course of Squamish River.

07/15/91

COUNTRY: Canada

SUBDIVISION: British Columbia Province

DATE: 1975; 7/22

RIVER OR LAKE: Meager Creek

TYPE OF LANDSLIDE: Slide, debris /avalanche, debris

TRIGGER: Snowmelt

LANDSLIDE VOLUME (m^3): 29,000,000

DAM TYPE: ?

DAM HEIGHT (m): ?

DAM LENGTH (m): ?

DAM WIDTH (m): ?

LAKE LENGTH (m): ?

LAKE VOLUME (m^3): ?

TIME TO FAILURE (days): ?

FAILURE MECHANISM: ?

BREACH DIMENSIONS: ?

CONTROLS: -

DAM MATERIALS: Weak pyroclastic rocks, rock debris, glacial ice.

REFERENCES: Mokievsky-Zubok, 1977; Evans, 1986; Jordan, 1987.

COMMENTS: Four killed; small lake formed has filled with sediment.

07/15/91

COUNTRY: Canada

SUBDIVISION: British Columbia Province

DATE: 1984; 6/?

RIVER OR LAKE: Squamish River

TYPE OF LANDSLIDE: Flow, debris

TRIGGER: ?

LANDSLIDE VOLUME (m^3): ?

DAM TYPE: ?

DAM HEIGHT (m): ?

DAM LENGTH (m): ?

DAM WIDTH (m): ?

LAKE LENGTH (m): ?

LAKE VOLUME (m^3): ?

TIME TO FAILURE (days): ?

FAILURE MECHANISM: ?

BREACH DIMENSIONS: ?

CONTROLS: ?

DAM MATERIALS: Pyroclastic debris.

REFERENCES: Evans, 1986.

COMMENTS: Debris flow from Cayley volcano ran down Turbid Creek and dammed Squamish River at mouth of Turbid Creek.

07/15/91

COUNTRY: Canada

SUBDIVISION: British Columbia Province

DATE: 1984; 10/8

RIVER OR LAKE: Ryan River

TYPE OF LANDSLIDE: Flow, debris

TRIGGER: Rainfall

LANDSLIDE VOLUME (m^3): ?

DAM TYPE: ?

DAM HEIGHT (m): 2 - 3

DAM LENGTH (m): ?

DAM WIDTH (m): ?

LAKE LENGTH (m): ?

LAKE VOLUME (m^3): ?

TIME TO FAILURE (days): ?

FAILURE MECHANISM: ?

BREACH DIMENSIONS: ?

CONTROLS: -

DAM MATERIALS: Coarse quartz-diorite boulders.

REFERENCES: Jordan, 1987.

COMMENTS: -

07/15/91

COUNTRY: Canada

SUBDIVISION: British Columbia Province, 2.6 km below Spences Bridge

DATE: 1921; 8/13

RIVER OR LAKE: Thompson River

TYPE OF LANDSLIDE: Slump

TRIGGER: Human-caused (irrigation seepage)

LANDSLIDE VOLUME (m^3): ?

DAM TYPE: II

DAM HEIGHT (m): ?

DAM LENGTH (m): ?

DAM WIDTH (m): ?

LAKE LENGTH (m): ?

LAKE VOLUME (m^3): ?

TIME TO FAILURE (days): ?

FAILURE MECHANISM: ?

BREACH DIMENSIONS: ?

CONTROLS: ?

DAM MATERIALS: Glacial-lacustrine silts.

REFERENCES: Evans, 1984; 1986.

COMMENTS: -

07/15/91

COUNTRY: Canada

SUBDIVISION: British Columbia Province, Ashcroft

DATE: 1880; 10/14

RIVER OR LAKE: Thompson River

TYPE OF LANDSLIDE: Slump

TRIGGER: Human-caused (irrigation seepage)

LANDSLIDE VOLUME (m^3): 15,000,000

DAM TYPE: II

DAM HEIGHT (m): 18 - 25

DAM LENGTH (m): 274

DAM WIDTH (m): 880

LAKE LENGTH (m): 14,000

LAKE VOLUME (m^3): 65,000,000

TIME TO FAILURE (days): 1.8

FAILURE MECHANISM: Overtopping

BREACH DIMENSIONS: -

CONTROLS: Channel cut over top of dam by workers.

DAM MATERIALS: Pleistocene glacial-lacustrine sediments.

REFERENCES: Drysdale, 1914; Evans, 1984; 1986.

COMMENTS: Channel dry for 35 km downstream; gradual slow breaching.

07/15/91

COUNTRY: Canada

SUBDIVISION: British Columbia Province, Britannia Beach

DATE: 1921; 10/28

RIVER OR LAKE: Britannia Creek

TYPE OF LANDSLIDE: ?

TRIGGER: Rainfall

LANDSLIDE VOLUME (m^3): ?

DAM TYPE: ?

DAM HEIGHT (m): ?

DAM LENGTH (m): ?

DAM WIDTH (m): ?

LAKE LENGTH (m): ?

LAKE VOLUME (m^3): ?

TIME TO FAILURE (days): ?

FAILURE MECHANISM: ?

BREACH DIMENSIONS: ?

CONTROLS: -

DAM MATERIALS: ?

REFERENCES: Evans, 1986.

COMMENTS: 37 killed; 50 houses destroyed by landslide.

07/15/91

COUNTRY: Canada

SUBDIVISION: British Columbia Province, Devastation Glacier

DATE: 1931; 10/?

RIVER OR LAKE: Meager Creek tributary

TYPE OF LANDSLIDE: ?

TRIGGER: ?

LANDSLIDE VOLUME (m^3): ?

DAM TYPE: ?

DAM HEIGHT (m): ?

DAM LENGTH (m): ?

DAM WIDTH (m): ?

LAKE LENGTH (m): ?

LAKE VOLUME (m^3): ?

TIME TO FAILURE (days): ?

FAILURE MECHANISM: ?

BREACH DIMENSIONS: ?

CONTROLS: ?

DAM MATERIALS: Volcanic ash and debris.

REFERENCES: Carter, 1932; Evans, 1986.

COMMENTS: Landslide onto Devastation Glacier; dammed surface drainage.

07/15/91

COUNTRY: Canada

SUBDIVISION: British Columbia Province, Farwell Canyon

DATE: 1964; 8/19

RIVER OR LAKE: Chilcotin River

TYPE OF LANDSLIDE: Slump

TRIGGER: ?

LANDSLIDE VOLUME (m^3): ?

DAM TYPE: II

DAM HEIGHT (m): ?

DAM LENGTH (m): ?

DAM WIDTH (m): ?

LAKE LENGTH (m): ?

LAKE VOLUME (m^3): ?

TIME TO FAILURE (days): 7

FAILURE MECHANISM: Overtopping

BREACH DIMENSIONS: -

CONTROLS: -

DAM MATERIALS: Stratified sands and silts.

REFERENCES: Evans, 1986.

COMMENTS: Bridge floated off foundation by lake.

07/15/91

COUNTRY: Canada

SUBDIVISION: British Columbia Province, North Pacific Cannery

DATE: 1891; 7/6

RIVER OR LAKE: Unnamed Creek

TYPE OF LANDSLIDE: ?

TRIGGER: Rainfall

LANDSLIDE VOLUME (m^3): ?

DAM TYPE: ?

DAM HEIGHT (m): ?

DAM LENGTH (m): ?

DAM WIDTH (m): ?

LAKE LENGTH (m): ?

LAKE VOLUME (m^3): ?

TIME TO FAILURE (days): 0.3

FAILURE MECHANISM: ?

BREACH DIMENSIONS: ?

CONTROLS: -

DAM MATERIALS: ?

REFERENCES: Evans, 1986.

COMMENTS: Indians ran at sound of landslide, then returned to work. Then engulfed in flood from landslide dam failure. 13-40 killed.

07/15/91

COUNTRY: Canada

SUBDIVISION: British Columbia Province, Rubble Creek

DATE: 1855 - 1856 (winter)

RIVER OR LAKE: Cheakamus River

TYPE OF LANDSLIDE: Avalanche, rock

TRIGGER: ?

LANDSLIDE VOLUME (m^3): 25,000,000

DAM TYPE: II

DAM HEIGHT (m): ?

DAM LENGTH (m): 200 - 350

DAM WIDTH (m): 3,500

LAKE LENGTH (m): ?

LAKE VOLUME (m^3): ?

TIME TO FAILURE (days): ?

FAILURE MECHANISM: Overtopping

BREACH DIMENSIONS: ?

CONTROLS: -

DAM MATERIALS: Angular volcanics; silt - 5-m blocks; 14% > 15.2 cm; k = 10E-4cm/s.

REFERENCES: Moore and Mathews, 1978; Eisbacher and Clague, 1984; Jordan, 1987.

COMMENTS: Several meters of aggradation, then degradation.
Two to four cubic meters/sec seeping from lakes.
15 meter-deep channel in landslide.

07/15/91

COUNTRY: Canada

SUBDIVISION: British Columbia Province, Spences Bridge

DATE: 1905; 8/13

RIVER OR LAKE: Thompson River

TYPE OF LANDSLIDE: Slump

TRIGGER: Human-caused (irrigation seepage)

LANDSLIDE VOLUME (m^3): ?

DAM TYPE: II

DAM HEIGHT (m): 6

DAM LENGTH (m): ?

DAM WIDTH (m): ?

LAKE LENGTH (m): ?

LAKE VOLUME (m^3): ?

TIME TO FAILURE (days): 0.2

FAILURE MECHANISM: Overtopping

BREACH DIMENSIONS: ?

CONTROLS: -

DAM MATERIALS: Glacial-lacustrine valley fill.

REFERENCES: Drysdale, 1914; Evans, 1984.

COMMENTS: 3-5 m wave upstream when dam formed; river rapidly cut through dam.

07/15/91

COUNTRY: Canada

SUBDIVISION: British Columbia Province, Spences Bridge

DATE: 1899; 12/31

RIVER OR LAKE: Thompson River

TYPE OF LANDSLIDE: ?

TRIGGER: ?

LANDSLIDE VOLUME (m^3): ?

DAM TYPE: ?

DAM HEIGHT (m): ?

DAM LENGTH (m): ?

DAM WIDTH (m): ?

LAKE LENGTH (m): ?

LAKE VOLUME (m^3): ?

TIME TO FAILURE (days): ?

FAILURE MECHANISM: ?

BREACH DIMENSIONS: ?

CONTROLS: -

DAM MATERIALS: Glacial-lacustrine silts.

REFERENCES: Evans, 1984, 1986.

COMMENTS: Lake extended upstream to mouth of Nicola River.

07/15/91

COUNTRY: Canada

SUBDIVISION: British Columbia Province, near Yeth Creek

DATE: 1978; fall

RIVER OR LAKE: Inklin River

TYPE OF LANDSLIDE: Avalanche, debris

TRIGGER: Undercutting

LANDSLIDE VOLUME (m^3): 1,000,000

DAM TYPE: II

DAM HEIGHT (m): 30

DAM LENGTH (m): ?

DAM WIDTH (m): 100

LAKE LENGTH (m): 11,000

LAKE VOLUME (m^3): ?

TIME TO FAILURE (days): ?

FAILURE MECHANISM: ?

BREACH DIMENSIONS: ?

CONTROLS: Natural spillway slowly eroding through dam.

DAM MATERIALS: Glacio-fluvial sand and gravel.

REFERENCES: R.G. Updike, U.S. Geological Survey, unpub. data, 1979; Evans, 1986.

COMMENTS: Two photos in Evans, 1986; shows higher strandline; may have slowly eroded 10 m of landslide dam.

07/15/91

COUNTRY: Canada

SUBDIVISION: Ontario Province, 48 km east of Ottawa

DATE: 1971; 5/16

RIVER OR LAKE: South Nation River

TYPE OF LANDSLIDE: Spread, lateral

TRIGGER: Snowmelt

LANDSLIDE VOLUME (m^3): ? (area = 0.28 sq km)

DAM TYPE: III

DAM HEIGHT (m): 11

DAM LENGTH (m): 200

DAM WIDTH (m): 2,450

LAKE LENGTH (m): ?

LAKE VOLUME (m^3): ?

TIME TO FAILURE (days): ?

FAILURE MECHANISM: ?

BREACH DIMENSIONS: ?

CONTROLS: ?

DAM MATERIALS: Sensitive marine clay.

REFERENCES: Eden and others, 1971.

COMMENTS: The Eden reference was written before overtopping occurred. Quick-clay materials.

07/15/91

COUNTRY: Canada

SUBDIVISION: Quebec Province

DATE: 1840; 4/4

RIVER OR LAKE: Maskinonge River

TYPE OF LANDSLIDE: Spread, lateral

TRIGGER: Snowmelt

LANDSLIDE VOLUME (m^3): ?

DAM TYPE: III

DAM HEIGHT (m): 23

DAM LENGTH (m): ?

DAM WIDTH (m): ?

LAKE LENGTH (m): 14,400

LAKE VOLUME (m^3): ?

TIME TO FAILURE (days): 2

FAILURE MECHANISM: Overtopping

BREACH DIMENSIONS: ?

CONTROLS: -

DAM MATERIALS: Sensitive marine clay.

REFERENCES: Logan, 1842.

COMMENTS: Flooded upvalley houses; 3 m aggradation all that remained in 6 mo.

07/15/91

COUNTRY: Canada

SUBDIVISION: Quebec Province

DATE: 1894; 4/27

RIVER OR LAKE: St. Anne River

TYPE OF LANDSLIDE: Spread, lateral

TRIGGER: ?

LANDSLIDE VOLUME (m^3): 19,600,000

DAM TYPE: III

DAM HEIGHT (m): ?

DAM LENGTH (m): ?

DAM WIDTH (m): ?

LAKE LENGTH (m): ?

LAKE VOLUME (m^3): ?

TIME TO FAILURE (days): ?

FAILURE MECHANISM: ?

BREACH DIMENSIONS: ?

CONTROLS: -

DAM MATERIALS: Sensitive marine clay; Saxicava sand over Leda clay.

REFERENCES: Laflamme, 1894.

COMMENTS: Four killed; five farms destroyed by landslide.

07/15/91

COUNTRY: Canada

SUBDIVISION: Quebec Province

DATE: 1908; 4/6

RIVER OR LAKE: Lievre River

TYPE OF LANDSLIDE: Spread, lateral

TRIGGER: ?

LANDSLIDE VOLUME (m^3): ?

DAM TYPE: ?

DAM HEIGHT (m): 2.7

DAM LENGTH (m): ?

DAM WIDTH (m): ?

LAKE LENGTH (m): ?

LAKE VOLUME (m^3): ?

TIME TO FAILURE (days): ?

FAILURE MECHANISM: ?

BREACH DIMENSIONS: ?

CONTROLS: -

DAM MATERIALS: Silty and sandy Leda clay.

REFERENCES: Ells, 1908.

COMMENTS: 37 buildings destroyed, 33 killed by landslide. Damage greatly increased by ice on river at time of failure.

07/15/91

COUNTRY: Canada

SUBDIVISION: Quebec Province

DATE: 1943; 5/?

RIVER OR LAKE: Grand River

TYPE OF LANDSLIDE: Fall, soil

TRIGGER: ?

LANDSLIDE VOLUME (m^3): ?

DAM TYPE: I

DAM HEIGHT (m): ?

DAM LENGTH (m): 150

DAM WIDTH (m): 137

LAKE LENGTH (m): ?

LAKE VOLUME (m^3): ?

TIME TO FAILURE (days): "few days"

FAILURE MECHANISM: ?

BREACH DIMENSIONS: ?

CONTROLS: -

DAM MATERIALS: Sand over Leda clay

REFERENCES: Clark, 1947.

COMMENTS: Very bad odor of black clay; river moved 60 m west of normal course.

07/15/91

COUNTRY: Canada

SUBDIVISION: Quebec Province

DATE: 1903; 10/11

RIVER OR LAKE: Lievre River

TYPE OF LANDSLIDE: Spread, lateral

TRIGGER: Rainfall

LANDSLIDE VOLUME (m^3): ?

DAM TYPE: III

DAM HEIGHT (m): 6 - 9

DAM LENGTH (m): 120

DAM WIDTH (m): 600

LAKE LENGTH (m): ?

LAKE VOLUME (m^3): ?

TIME TO FAILURE (days): ?

FAILURE MECHANISM: ?

BREACH DIMENSIONS: ?

CONTROLS: -

DAM MATERIALS: Sensitive marine sandy and silty clay.

REFERENCES: Ells, 1906.

COMMENTS: -

07/15/91

COUNTRY: Canada

SUBDIVISION: Quebec Province, Portneuf County

DATE: 1898; 5/7

RIVER OR LAKE: Blanche River

TYPE OF LANDSLIDE: Spread, lateral

TRIGGER: Snowmelt

LANDSLIDE VOLUME (m^3): 2,700,000

DAM TYPE: III

DAM HEIGHT (m): 8

DAM LENGTH (m): 460

DAM WIDTH (m): 3,200

LAKE LENGTH (m): ?

LAKE VOLUME (m^3): ?

TIME TO FAILURE (days): ?

FAILURE MECHANISM: ?

BREACH DIMENSIONS: ?

CONTROLS: ?

DAM MATERIALS: Sensitive marine clay.

REFERENCES: Dawson, 1898.

COMMENTS: Flooded agricultural land.

07/15/91

COUNTRY: Canada

SUBDIVISION: Quebec Province, Yamaska County

DATE: 1945; 5/18

RIVER OR LAKE: Yamaska River

TYPE OF LANDSLIDE: Spread, lateral

TRIGGER: Rainfall

LANDSLIDE VOLUME (m^3): 118,000

DAM TYPE: III

DAM HEIGHT (m): 3.4

DAM LENGTH (m): 67

DAM WIDTH (m): 330

LAKE LENGTH (m): ?

LAKE VOLUME (m^3): ?

TIME TO FAILURE (days): ?

FAILURE MECHANISM: Overtopping

BREACH DIMENSIONS: ?

CONTROLS: -

DAM MATERIALS: Sensitive marine clay; sandy soil over 10 m blue clay; sandy clay.

REFERENCES: Clark, 1947.

COMMENTS: Rapids persisted after failure.

07/15/91

COUNTRY: Chile

SUBDIVISION: (southern)

DATE: 1960; 5/22

RIVER OR LAKE: San Pedro River; Lake Rinihue

TYPE OF LANDSLIDE: Slump /spread, lateral

TRIGGER: Earthquake

LANDSLIDE VOLUME (m^3): 30,000,000

DAM TYPE: II

DAM HEIGHT (m): 26

DAM LENGTH (m): 1,100

DAM WIDTH (m): ?

LAKE LENGTH (m): ?

LAKE VOLUME (m^3): 2,500,000

TIME TO FAILURE (days): 63

FAILURE MECHANISM: Overtopping

BREACH DIMENSIONS: ?

CONTROLS: -

DAM MATERIALS: Mixture of Pleistocene conglomerate, sand, gravel, finer material.

REFERENCES: Davis and Karzulovic, 1963; Weischet, 1963.

COMMENTS: New dam raised lake surface 26 m; flood flow: 2 days: 7500 cms, 1 week: 1500 cms, 6 mo: a few hundred cubic meters/s. Failure caused catastrophic flooding.

07/15/91

COUNTRY: Chile

SUBDIVISION: (southern)

DATE: 1960; 5/22

RIVER OR LAKE: Lake Pellaifa

TYPE OF LANDSLIDE: Avalanche, rock

TRIGGER: Earthquake

LANDSLIDE VOLUME (m^3): ?

DAM TYPE: ?

DAM HEIGHT (m): 8

DAM LENGTH (m): ?

DAM WIDTH (m): ?

LAKE LENGTH (m): ?

LAKE VOLUME (m^3): ?

TIME TO FAILURE (days): Did not fail.

FAILURE MECHANISM: ?

BREACH DIMENSIONS: ?

CONTROLS: ?

DAM MATERIALS: Volcanics.

REFERENCES: Weischet, 1963.

COMMENTS: Level of Lake Pellaifa raised 8 m by landslide.
Don't know if failed afterward (apparently not).

07/15/91

COUNTRY: Chile

SUBDIVISION: (southern)

DATE: 1575; 12/16

RIVER OR LAKE: San Pedro River; Lake Rinihue

TYPE OF LANDSLIDE: ?

TRIGGER: Earthquake

LANDSLIDE VOLUME (m^3): 100,000,000

DAM TYPE: II

DAM HEIGHT (m): ?

DAM LENGTH (m): ?

DAM WIDTH (m): 2,000

LAKE LENGTH (m): ?

LAKE VOLUME (m^3): ?

TIME TO FAILURE (days): 134

FAILURE MECHANISM: ?

BREACH DIMENSIONS: ?

CONTROLS: -

DAM MATERIALS: ?

REFERENCES: Davis and Karzulovic, 1963; Ericksen and others, 1989.

COMMENTS: Dam failure caused huge flood that destroyed parts of Valdivia.

07/15/91

COUNTRY: China

SUBDIVISION: Gansu Province, Chingning

DATE: 1718; 6/19

RIVER OR LAKE: Chihpingchuan River

TYPE OF LANDSLIDE: ?

TRIGGER: Earthquake

LANDSLIDE VOLUME (m^3): ?

DAM TYPE: ?

DAM HEIGHT (m): ?

DAM LENGTH (m): ?

DAM WIDTH (m): ?

LAKE LENGTH (m): ?

LAKE VOLUME (m^3): ?

TIME TO FAILURE (days): ?

FAILURE MECHANISM: ?

BREACH DIMENSIONS: ?

CONTROLS: ?

DAM MATERIALS: ?

REFERENCES: Guu, 1979.

COMMENTS: -

07/15/91

COUNTRY: China

SUBDIVISION: Gansu Province, E of Yungchang

DATE: 1927; 5/23

RIVER OR LAKE: Chinlungpei River

TYPE OF LANDSLIDE: ?

TRIGGER: Earthquake

LANDSLIDE VOLUME (m^3): ?

DAM TYPE: ?

DAM HEIGHT (m): ?

DAM LENGTH (m): ?

DAM WIDTH (m): ?

LAKE LENGTH (m): ?

LAKE VOLUME (m^3): ?

TIME TO FAILURE (days): ?

FAILURE MECHANISM: ?

BREACH DIMENSIONS: ?

CONTROLS: ?

DAM MATERIALS: ?

REFERENCES: Guu, 1979.

COMMENTS: -

07/15/91

COUNTRY: China

SUBDIVISION: Gansu Province, Gulang

DATE: 1927; 5/23

RIVER OR LAKE: Zhalimuhe River

TYPE OF LANDSLIDE: ?

TRIGGER: Earthquake

LANDSLIDE VOLUME (m^3): ?

DAM TYPE: ?

DAM HEIGHT (m): ?

DAM LENGTH (m): ?

DAM WIDTH (m): ?

LAKE LENGTH (m): ?

LAKE VOLUME (m^3): ?

TIME TO FAILURE (days): 24

FAILURE MECHANISM: ?

BREACH DIMENSIONS: ?

CONTROLS: ?

DAM MATERIALS: ?

REFERENCES: Xue-Cai and An-ning, 1986.

COMMENTS: South of Wu Wei. Other landslide dams, too.

07/15/91

COUNTRY: China

SUBDIVISION: Gansu Province, Tianshui

DATE: 1654; 7/21

RIVER OR LAKE: Chouni River

TYPE OF LANDSLIDE: ?

TRIGGER: Earthquake

LANDSLIDE VOLUME (m^3): ?

DAM TYPE: ?

DAM HEIGHT (m): ?

DAM LENGTH (m): ?

DAM WIDTH (m): ?

LAKE LENGTH (m): ?

LAKE VOLUME (m^3): ?

TIME TO FAILURE (days): ?

FAILURE MECHANISM: ?

BREACH DIMENSIONS: ?

CONTROLS: ?

DAM MATERIALS: ?

REFERENCES: Xue-Cai and An-ning, 1986.

COMMENTS: -

07/15/91

COUNTRY: China

SUBDIVISION: Gansu Province, Wudu

DATE: 1879; 7/1

RIVER OR LAKE: Bailong River

TYPE OF LANDSLIDE: ?

TRIGGER: Earthquake

LANDSLIDE VOLUME (m^3): ?

DAM TYPE: ?

DAM HEIGHT (m): ?

DAM LENGTH (m): ?

DAM WIDTH (m): ?

LAKE LENGTH (m): ?

LAKE VOLUME (m^3): ?

TIME TO FAILURE (days): ?

FAILURE MECHANISM: ?

BREACH DIMENSIONS: ?

CONTROLS: ?

DAM MATERIALS: ?

REFERENCES: Xue-Cai and An-ning, 1986.

COMMENTS: Large number of slides near Wudu; "many checked-up lakes". Wudu town flooded.

07/15/91

COUNTRY: China

SUBDIVISION: Gansu Province, Wudu

DATE: 1987; 5/22

RIVER OR LAKE: Beiyu River

TYPE OF LANDSLIDE: Flow, debris

TRIGGER: Rainfall

LANDSLIDE VOLUME (m^3): 1,440,000

DAM TYPE: III

DAM HEIGHT (m): ?

DAM LENGTH (m): ?

DAM WIDTH (m): ?

LAKE LENGTH (m): ?

LAKE VOLUME (m^3): ?

TIME TO FAILURE (days): 0.04

FAILURE MECHANISM: Overtopping

BREACH DIMENSIONS: ?

CONTROLS: -

DAM MATERIALS: Included large stones 0.5-2 m; largest 6x4x3 m.

REFERENCES: Zeng and Lang, 1988.

COMMENTS: Large debris flow from mouth of Anping valley; dammed river upstream from Wudu; village of Majie briefly flooded by backwater.

07/15/91

COUNTRY: China

SUBDIVISION: Gansu Province, Zhouqu

DATE: 1879

RIVER OR LAKE: Bailong River

TYPE OF LANDSLIDE: ?

TRIGGER: Earthquake

LANDSLIDE VOLUME (m^3): ?

DAM TYPE: ?

DAM HEIGHT (m): ?

DAM LENGTH (m): ?

DAM WIDTH (m): ?

LAKE LENGTH (m): ?

LAKE VOLUME (m^3): ?

TIME TO FAILURE (days): ?

FAILURE MECHANISM: ?

BREACH DIMENSIONS: ?

CONTROLS: ?

DAM MATERIALS: Weathered clay-rich phyllite and schist and overlying loess.

REFERENCES: X. Feng, Gansu Province Academy of Science, unpub. data, 1988; Li and others, 1986.

COMMENTS: Dam failed, but don't know when.

07/15/91

COUNTRY: China

SUBDIVISION: Gansu Province, Zhouqu

DATE: 1981; 4/11

RIVER OR LAKE: Bailong River

TYPE OF LANDSLIDE: Flow, earth

TRIGGER: ?

LANDSLIDE VOLUME (m^3): 40,000,000

DAM TYPE: ?

DAM HEIGHT (m): 25

DAM LENGTH (m): ?

DAM WIDTH (m): ?

LAKE LENGTH (m): ?

LAKE VOLUME (m^3): 19,000,000

TIME TO FAILURE (days): Did not fail.

FAILURE MECHANISM: -

BREACH DIMENSIONS: -

CONTROLS: Chinese army blasted channel through dam.

DAM MATERIALS: Severely fragmented and deeply weathered phyllite, schist, loess.

REFERENCES: Li and others, 1986; X. Feng, Gansu Province Academy of Science, unpub. data, 1988.

COMMENTS: Depth of lake = 21.7 m.

07/15/91

COUNTRY: China

SUBDIVISION: Gansu Province, Zhouqu

DATE: 1963; 10/2

RIVER OR LAKE: Bailong River

TYPE OF LANDSLIDE: Slide, earth /flow, earth

TRIGGER: Rainfall

LANDSLIDE VOLUME (m^3): 25,000,000

DAM TYPE: ?

DAM HEIGHT (m): 17

DAM LENGTH (m): ?

DAM WIDTH (m): ?

LAKE LENGTH (m): ?

LAKE VOLUME (m^3): 7,000,000

TIME TO FAILURE (days): ?

FAILURE MECHANISM: ?

BREACH DIMENSIONS: ?

CONTROLS: ?

DAM MATERIALS: Severely fragmented and deeply weathered phyllite, schist, loess.

REFERENCES: Li and others, 1986.

COMMENTS: Slide reactivated many times other than 1963 and 1981.

07/15/91

COUNTRY: China

SUBDIVISION: Hubei Province, Yangtze Gorges

DATE: 377

RIVER OR LAKE: Yangtze River

TYPE OF LANDSLIDE: ?

TRIGGER: ?

LANDSLIDE VOLUME (m^3): 26,000,000

DAM TYPE: ?

DAM HEIGHT (m): ?

DAM LENGTH (m): ?

DAM WIDTH (m): ?

LAKE LENGTH (m): 50,000

LAKE VOLUME (m^3): ?

TIME TO FAILURE (days): ?

FAILURE MECHANISM: ?

BREACH DIMENSIONS: ?

CONTROLS: ?

DAM MATERIALS: ?

REFERENCES: Li, 1989.

COMMENTS: Landslide obstructed navigation for many years.

07/15/91

COUNTRY: China

SUBDIVISION: Hubei Province, Yangtze Gorges

DATE: 1026

RIVER OR LAKE: Yangtze River

TYPE OF LANDSLIDE: ?

TRIGGER: ?

LANDSLIDE VOLUME (m^3): 15,000,000

DAM TYPE: ?

DAM HEIGHT (m): ?

DAM LENGTH (m): ?

DAM WIDTH (m): ?

LAKE LENGTH (m): ?

LAKE VOLUME (m^3): ?

TIME TO FAILURE (days): ?

FAILURE MECHANISM: ?

BREACH DIMENSIONS: ?

CONTROLS: ?

DAM MATERIALS: ?

REFERENCES: Li, 1989.

COMMENTS: Obstructed navigation in a 15-km section of the river for about 22 years.

07/15/91

COUNTRY: China

SUBDIVISION: Hunan Province

DATE: -1767 BC

RIVER OR LAKE: Yi and Luo Rivers

TYPE OF LANDSLIDE: ?

TRIGGER: Earthquake

LANDSLIDE VOLUME (m^3): ?

DAM TYPE: ?

DAM HEIGHT (m): ?

DAM LENGTH (m): ?

DAM WIDTH (m): ?

LAKE LENGTH (m): ?

LAKE VOLUME (m^3): ?

TIME TO FAILURE (days): ?

FAILURE MECHANISM: ?

BREACH DIMENSIONS: ?

CONTROLS: ?

DAM MATERIALS: ?

REFERENCES: Xue-Cai and An-ning, 1986.

COMMENTS: Oldest known landslide dams.

07/15/91

COUNTRY: China

SUBDIVISION: Hunan Province, Moyen

DATE: 1786

RIVER OR LAKE: ?

TYPE OF LANDSLIDE: ?

TRIGGER: Earthquake

LANDSLIDE VOLUME (m^3): ?

DAM TYPE: ?

DAM HEIGHT (m): ?

DAM LENGTH (m): ?

DAM WIDTH (m): ?

LAKE LENGTH (m): ?

LAKE VOLUME (m^3): ?

TIME TO FAILURE (days): ?

FAILURE MECHANISM: ?

BREACH DIMENSIONS: ?

CONTROLS: ?

DAM MATERIALS: ?

REFERENCES: Guu, 1979.

COMMENTS: -

07/15/91

COUNTRY: China

SUBDIVISION: Ningxia Autonomous Region, near Gansu border

DATE: 1920; 12/16

RIVER OR LAKE: 30 lakes formed near Xiji

TYPE OF LANDSLIDE: Slide, earth /flow, earth (mainly loess)

TRIGGER: Earthquake

LANDSLIDE VOLUME (m^3): ?

DAM TYPE: ?

DAM HEIGHT (m): ?

DAM LENGTH (m): ?

DAM WIDTH (m): ?

LAKE LENGTH (m): 5,000; (380 m wide) (one lake)

LAKE VOLUME (m^3): ?

TIME TO FAILURE (days): ?

FAILURE MECHANISM: ?

BREACH DIMENSIONS: ?

CONTROLS: ?

DAM MATERIALS: Loess.

REFERENCES: Close and McCormick, 1922; Xue-Cai and An-ning, 1986; Adams, 1988; Liu, 1988.

COMMENTS: 675 landslides; M = 8.5; 240,000 killed by earthquake; many landslide-dammed lakes; good photos in Xue-Cai and An-ning, 1986.

07/15/91

COUNTRY: China

SUBDIVISION: Qinghai Province, Bitang

DATE: 1961; 11/14

RIVER OR LAKE: Bitang Creek

TYPE OF LANDSLIDE: Slump

TRIGGER: ?

LANDSLIDE VOLUME (m^3): 80,000,000

DAM TYPE: ?

DAM HEIGHT (m): 65

DAM LENGTH (m): ?

DAM WIDTH (m): ?

LAKE LENGTH (m): 1,000

LAKE VOLUME (m^3): 4,200,000

TIME TO FAILURE (days): Did not fail.

FAILURE MECHANISM: -

BREACH DIMENSIONS: -

CONTROLS: Use of lake water for irrigation; evaporation; seepage.

DAM MATERIALS: Soft Tertiary claystone.

REFERENCES: Li and others, 1986.

COMMENTS: Good example of lake that never fully filled landslide-dammed basin.

07/15/91

COUNTRY: China

SUBDIVISION: Qinghai Province, near Longyang Gorge damsite

DATE: 1943 (winter)

RIVER OR LAKE: Yellow River

TYPE OF LANDSLIDE: Slide, earth /avalanche, debris

TRIGGER: ?

LANDSLIDE VOLUME (m^3): 100,000,000 - 150,000,000

DAM TYPE: II

DAM HEIGHT (m): ?

DAM LENGTH (m): ?

DAM WIDTH (m): ?

LAKE LENGTH (m): 1,500 - 2,000; (100-200 m wide)

LAKE VOLUME (m^3): ?

TIME TO FAILURE (days): ?

FAILURE MECHANISM: ?

BREACH DIMENSIONS: ?

CONTROLS: -

DAM MATERIALS: Siltstone and mudstone rubble.

REFERENCES: Liu and others, 1984; Lu Zhongyou, 1984.

COMMENTS: Partial failure of dam; large lake existed in 1984.

07/15/91

COUNTRY: China

SUBDIVISION: Shaanxi Provence, Ning-qiang County

DATE: 1981; 8/23

RIVER OR LAKE: Jiang Han River

TYPE OF LANDSLIDE: Slide, rock /flow, debris

TRIGGER: ?

LANDSLIDE VOLUME (m^3): 480,000

DAM TYPE: II

DAM HEIGHT (m): 30

DAM LENGTH (m): 100

DAM WIDTH (m): 1,060

LAKE LENGTH (m): 160

LAKE VOLUME (m^3): ?

TIME TO FAILURE (days): ?

FAILURE MECHANISM: ?

BREACH DIMENSIONS: ?

CONTROLS: ?

DAM MATERIALS: Chlorite schist.

REFERENCES: Hu Guangtao, 1987.

COMMENTS: -

07/15/91

COUNTRY: China

SUBDIVISION: Shaanxi Province, Lantian

DATE: -35 BC; 7/?

RIVER OR LAKE: Ba River

TYPE OF LANDSLIDE: ?

TRIGGER: Earthquake

LANDSLIDE VOLUME (m^3): ?

DAM TYPE: ?

DAM HEIGHT (m): ?

DAM LENGTH (m): ?

DAM WIDTH (m): ?

LAKE LENGTH (m): ?

LAKE VOLUME (m^3): ?

TIME TO FAILURE (days): ?

FAILURE MECHANISM: ?

BREACH DIMENSIONS: ?

CONTROLS: ?

DAM MATERIALS: ?

REFERENCES: Guu, 1979.

COMMENTS: -

07/15/91

COUNTRY: China

SUBDIVISION: Shaanxi Province, Lantian

DATE: -35 BC; 7/?

RIVER OR LAKE: Jing River

TYPE OF LANDSLIDE: ?

TRIGGER: Earthquake

LANDSLIDE VOLUME (m^3): ?

DAM TYPE: ?

DAM HEIGHT (m): ?

DAM LENGTH (m): ?

DAM WIDTH (m): ?

LAKE LENGTH (m): ?

LAKE VOLUME (m^3): ?

TIME TO FAILURE (days): ?

FAILURE MECHANISM: ?

BREACH DIMENSIONS: ?

CONTROLS: ?

DAM MATERIALS: ?

REFERENCES: Guu, 1979.

COMMENTS: Dike collapsed and blocked the Jing River, making water "flow backward".

07/15/91

COUNTRY: China

SUBDIVISION: Shaanxi Province, Qishan County

DATE: -780 BC

RIVER OR LAKE: Jin, Wei, and Luo Rivers

TYPE OF LANDSLIDE: ?

TRIGGER: Earthquake

LANDSLIDE VOLUME (m^3): ?

DAM TYPE: ?

DAM HEIGHT (m): ?

DAM LENGTH (m): ?

DAM WIDTH (m): ?

LAKE LENGTH (m): ?

LAKE VOLUME (m^3): ?

TIME TO FAILURE (days): ?

FAILURE MECHANISM: ?

BREACH DIMENSIONS: ?

CONTROLS: ?

DAM MATERIALS: ?

REFERENCES: Xue-Cai and An-ning, 1986.

COMMENTS: -

07/15/91

COUNTRY: China

SUBDIVISION: Sichuan Province

DATE: 1967; 6/8

RIVER OR LAKE: Yalong River

TYPE OF LANDSLIDE: Slide, debris /avalanche, debris

TRIGGER: Rainfall

LANDSLIDE VOLUME (m^3): 68,000,000

DAM TYPE: III

DAM HEIGHT (m): 175

DAM LENGTH (m): ?

DAM WIDTH (m): 3,000

LAKE LENGTH (m): 53,000

LAKE VOLUME (m^3): 680,000,000

TIME TO FAILURE (days): 9

FAILURE MECHANISM: Overtopping

BREACH DIMENSIONS: ?

CONTROLS: -

DAM MATERIALS: ?

REFERENCES: Li and others, 1986.

COMMENTS: First breached to depth of 88 m over 13 hrs; huge flood, 50 m deep at 6 km downstream, 16.5 m at 551 km downstream.

07/15/91

COUNTRY: China

SUBDIVISION: Sichuan Province, Batang

DATE: 1870; 4/11

RIVER OR LAKE: ?

TYPE OF LANDSLIDE: ?

TRIGGER: Earthquake

LANDSLIDE VOLUME (m^3): ?

DAM TYPE: ?

DAM HEIGHT (m): ?

DAM LENGTH (m): ?

DAM WIDTH (m): ?

LAKE LENGTH (m): ?

LAKE VOLUME (m^3): ?

TIME TO FAILURE (days): ?

FAILURE MECHANISM: ?

BREACH DIMENSIONS: ?

CONTROLS: ?

DAM MATERIALS: ?

REFERENCES: Guu, 1979.

COMMENTS: -

07/15/91

COUNTRY: China

SUBDIVISION: Sichuan Province, Deixi

DATE: 1933; 8/25

RIVER OR LAKE: Min River

TYPE OF LANDSLIDE: Slide, rock and earth

TRIGGER: Earthquake

LANDSLIDE VOLUME (m^3): 150,000,000

DAM TYPE: II

DAM HEIGHT (m): 255

DAM LENGTH (m): 400

DAM WIDTH (m): 1,300

LAKE LENGTH (m): 17,000

LAKE VOLUME (m^3): 400,000,000

TIME TO FAILURE (days): 7

FAILURE MECHANISM: Overtopping

BREACH DIMENSIONS: ?

CONTROLS: -

DAM MATERIALS: Quaternary alluvium and metamorphic rock.

REFERENCES: Li and others, 1986; Xue-Cai and An-ning, 1986.

COMMENTS: Failure of dam caused 60-m-high flood 3 km downstream; killed at least 2423 people; velocity was 20-25 km/hr.

07/15/91

COUNTRY: China

SUBDIVISION: Sichuan Province, Deixi

DATE: 1933; 8/25

RIVER OR LAKE: Min River

TYPE OF LANDSLIDE: Slide, rock /avalanche, rock

TRIGGER: Earthquake

LANDSLIDE VOLUME (m^3): ?

DAM TYPE: IV

DAM HEIGHT (m): 156

DAM LENGTH (m): 800

DAM WIDTH (m): 1,700

LAKE LENGTH (m): 12,500

LAKE VOLUME (m^3): 73,000,000

TIME TO FAILURE (days): 19

FAILURE MECHANISM: Overtopping

BREACH DIMENSIONS: ?

CONTROLS: -

DAM MATERIALS: Coarse rock debris, boulders to 5 m; ave 0.8-1.0 m.

REFERENCES: Li and others, 1986; Xue-Cai and An-ning, 1986.

COMMENTS: After overtopping occurred, Chinese army dug spillway across dam to stabilize lake level.

07/15/91

COUNTRY: China

SUBDIVISION: Sichuan Province, Deixi

DATE: 1933; 8/25

RIVER OR LAKE: Min River

TYPE OF LANDSLIDE: Slide, rock

TRIGGER: Earthquake

LANDSLIDE VOLUME (m^3): ?

DAM TYPE: II

DAM HEIGHT (m): 125

DAM LENGTH (m): ?

DAM WIDTH (m): ?

LAKE LENGTH (m): ?

LAKE VOLUME (m^3): ?

TIME TO FAILURE (days): 16

FAILURE MECHANISM: Overtopping

BREACH DIMENSIONS: ?

CONTROLS: -

DAM MATERIALS: Coarse rock debris; Quaternary materials.

REFERENCES: Li and others, 1986; Xue-Cai and An-ning, 1986.

COMMENTS: -

07/15/91

COUNTRY: China

SUBDIVISION: Sichuan Province, Deixi

DATE: 1933; 8/25

RIVER OR LAKE: Songping River; Gongpeng Lake

TYPE OF LANDSLIDE: Slide, rock

TRIGGER: Earthquake

LANDSLIDE VOLUME (m^3): ?

DAM TYPE: II

DAM HEIGHT (m): 50

DAM LENGTH (m): 200

DAM WIDTH (m): 100

LAKE LENGTH (m): ?

LAKE VOLUME (m^3): ?

TIME TO FAILURE (days): ?

FAILURE MECHANISM: ?

BREACH DIMENSIONS: ?

CONTROLS: ?

DAM MATERIALS: Broken Triassic sandstone; metamorphic rocks.

REFERENCES: Xue-Cai and An-ning, 1986.

COMMENTS: Tributary of Min River near Deixi.

07/15/91

COUNTRY: China

SUBDIVISION: Sichuan Province, Hanyuan County

DATE: 1971; 8/16

RIVER OR LAKE: Dadu River tributary

TYPE OF LANDSLIDE: Slump

TRIGGER: Rainfall

LANDSLIDE VOLUME (m^3): ?

DAM TYPE: II

DAM HEIGHT (m): 15

DAM LENGTH (m): ?

DAM WIDTH (m): 200

LAKE LENGTH (m): ?

LAKE VOLUME (m^3): ?

TIME TO FAILURE (days): ?

FAILURE MECHANISM: ?

BREACH DIMENSIONS: ?

CONTROLS: ?

DAM MATERIALS: Siltstones, mudstones, shales.

REFERENCES: Lu Zhongyou, 1984.

COMMENTS: Not known if dam failed.

07/15/91

COUNTRY: China

SUBDIVISION: Sichuan Province, Luding

DATE: 1786; 10/10

RIVER OR LAKE: Dadu River

TYPE OF LANDSLIDE: Slide, rock /avalanche, rock

TRIGGER: Earthquake

LANDSLIDE VOLUME (m^3): ?

DAM TYPE: ?

DAM HEIGHT (m): ?

DAM LENGTH (m): ?

DAM WIDTH (m): ?

LAKE LENGTH (m): ?

LAKE VOLUME (m^3): ?

TIME TO FAILURE (days): 10

FAILURE MECHANISM: Overtopping

BREACH DIMENSIONS: ?

CONTROLS: ?

DAM MATERIALS: ?

REFERENCES: Li and others, 1986; Xue-Cai and An-ning, 1986; Li, 1989.

COMMENTS: Flood: giant waves 10 m high; carried to Yichang 1400 km downstream on Yangtze River; as many as 100,000 drowned by flood; earthquake killed 500.

07/15/91

COUNTRY: China

SUBDIVISION: Sichuan Province, Luipo

DATE: 1216; 3/17

RIVER OR LAKE: ?

TYPE OF LANDSLIDE: ?

TRIGGER: Earthquake

LANDSLIDE VOLUME (m^3): ?

DAM TYPE: ?

DAM HEIGHT (m): ?

DAM LENGTH (m): ?

DAM WIDTH (m): ?

LAKE LENGTH (m): ?

LAKE VOLUME (m^3): ?

TIME TO FAILURE (days): ?

FAILURE MECHANISM: ?

BREACH DIMENSIONS: ?

CONTROLS: ?

DAM MATERIALS: ?

REFERENCES: Guu, 1979.

COMMENTS: Landslide for 10 km; the river blocked.

07/15/91

COUNTRY: China

SUBDIVISION: Sichuan Province, Mabian

DATE: 1935; 12/18

RIVER OR LAKE: Chingshakiang River

TYPE OF LANDSLIDE: ?

TRIGGER: Earthquake

LANDSLIDE VOLUME (m^3): ?

DAM TYPE: ?

DAM HEIGHT (m): ?

DAM LENGTH (m): ?

DAM WIDTH (m): ?

LAKE LENGTH (m): ?

LAKE VOLUME (m^3): ?

TIME TO FAILURE (days): ?

FAILURE MECHANISM: ?

BREACH DIMENSIONS: ?

CONTROLS: ?

DAM MATERIALS: ?

REFERENCES: Guu, 1979.

COMMENTS: -

07/15/91

COUNTRY: China

SUBDIVISION: Sichuan Province, N of Chienchiang

DATE: 1856; 6/10

RIVER OR LAKE: ?

TYPE OF LANDSLIDE: ?

TRIGGER: Earthquake

LANDSLIDE VOLUME (m^3): ?

DAM TYPE: ?

DAM HEIGHT (m): ?

DAM LENGTH (m): ?

DAM WIDTH (m): ?

LAKE LENGTH (m): 12,000

LAKE VOLUME (m^3): ?

TIME TO FAILURE (days): ?

FAILURE MECHANISM: ?

BREACH DIMENSIONS: ?

CONTROLS: ?

DAM MATERIALS: ?

REFERENCES: Guu, 1979.

COMMENTS: -

07/15/91

COUNTRY: China

SUBDIVISION: Sichuan Province, Nanjiang County

DATE: 1975; 9/13

RIVER OR LAKE: ?

TYPE OF LANDSLIDE: Slide, rock /flow, debris

TRIGGER: ?

LANDSLIDE VOLUME (m^3): 7,000,000

DAM TYPE: III

DAM HEIGHT (m): ?

DAM LENGTH (m): 200

DAM WIDTH (m): 450

LAKE LENGTH (m): 450

LAKE VOLUME (m^3): ?

TIME TO FAILURE (days): ?

FAILURE MECHANISM: ?

BREACH DIMENSIONS: ?

CONTROLS: ?

DAM MATERIALS: Debris from Triassic carbonate rock.

REFERENCES: Li, 1989.

COMMENTS: Landslide killed 195 people. Don't know what triggered it or name of river.

07/15/91

COUNTRY: China

SUBDIVISION: Sichuan Province, Nanping County

DATE: 1984; 7/18

RIVER OR LAKE: Bai-Shui River

TYPE OF LANDSLIDE: Flow, debris

TRIGGER: Rainfall

LANDSLIDE VOLUME (m^3): 218,000

DAM TYPE: III

DAM HEIGHT (m): ?

DAM LENGTH (m): 100

DAM WIDTH (m): 420

LAKE LENGTH (m): ?

LAKE VOLUME (m^3): ?

TIME TO FAILURE (days): ?

FAILURE MECHANISM: ?

BREACH DIMENSIONS: ?

CONTROLS: ?

DAM MATERIALS: ?

REFERENCES: Kang Zicheng, 1989.

COMMENTS: Not clear whether dam failed or not.

07/15/91

COUNTRY: China

SUBDIVISION: Sichuan Province, Tiehsi

DATE: 1713; 9/4

RIVER OR LAKE: Min River

TYPE OF LANDSLIDE: ?

TRIGGER: Earthquake

LANDSLIDE VOLUME (m^3): ?

DAM TYPE: ?

DAM HEIGHT (m): ?

DAM LENGTH (m): ?

DAM WIDTH (m): ?

LAKE LENGTH (m): ?

LAKE VOLUME (m^3): ?

TIME TO FAILURE (days): ?

FAILURE MECHANISM: ?

BREACH DIMENSIONS: ?

CONTROLS: ?

DAM MATERIALS: ?

REFERENCES: Guu, 1979.

COMMENTS: -

07/15/91

COUNTRY: China

SUBDIVISION: Sichuan Province, Wuxi County; Zhongyang

DATE: 1988; 1/10

RIVER OR LAKE: Xixi River; Yansai Lake

TYPE OF LANDSLIDE: Slide, rock

TRIGGER: ?

LANDSLIDE VOLUME (m^3): ? (area = 0.44 sq km)

DAM TYPE: ?

DAM HEIGHT (m): 12

DAM LENGTH (m): ?

DAM WIDTH (m): ?

LAKE LENGTH (m): ?

LAKE VOLUME (m^3): ? (depth = 12 m)

TIME TO FAILURE (days): ?

FAILURE MECHANISM: ?

BREACH DIMENSIONS: ?

CONTROLS: ?

DAM MATERIALS: ?

REFERENCES: Song and others, 1989.

COMMENTS: Lake submerged foundation excavations for Xining Hydropower station; also submerged 720 m of the diversion tunnel for power plant.

07/15/91

COUNTRY: China

SUBDIVISION: Sichuan Province, Xichun

DATE: 1948; 5/25

RIVER OR LAKE: Wulian River

TYPE OF LANDSLIDE: ?

TRIGGER: Earthquake

LANDSLIDE VOLUME (m^3): ?

DAM TYPE: ?

DAM HEIGHT (m): ?

DAM LENGTH (m): ?

DAM WIDTH (m): ?

LAKE LENGTH (m): ?

LAKE VOLUME (m^3): ?

TIME TO FAILURE (days): 5

FAILURE MECHANISM: ?

BREACH DIMENSIONS: ?

CONTROLS: ?

DAM MATERIALS: ?

REFERENCES: Guu, 1979.

COMMENTS: Embankments collapsed along the Wulian River.

07/15/91

COUNTRY: China

SUBDIVISION: Sichuan Province, Zepozhu

DATE: 1965; 10/27

RIVER OR LAKE: Dong River

TYPE OF LANDSLIDE: Slide, rock

TRIGGER: Rainfall

LANDSLIDE VOLUME (m^3): 29,000,000

DAM TYPE: II

DAM HEIGHT (m): 51

DAM LENGTH (m): ?

DAM WIDTH (m): 650

LAKE LENGTH (m): 1,000

LAKE VOLUME (m^3): 2,700,000

TIME TO FAILURE (days): 210

FAILURE MECHANISM: Overtopping

BREACH DIMENSIONS: ?

CONTROLS: -

DAM MATERIALS: Broken and weathered sandstone and mudstone.

REFERENCES: Li and others, 1986.

COMMENTS: Long time to fail because of seepage through dam. 50 m deep by late Dec, level stationary for next 5 mo. Overtopped due to heavy rainfall.

07/15/91

COUNTRY: China

SUBDIVISION: Sichuan and Yunnan Provinces

DATE: 1880

RIVER OR LAKE: Yangtze River

TYPE OF LANDSLIDE: ?

TRIGGER: ?

LANDSLIDE VOLUME (m^3): ?

DAM TYPE: ?

DAM HEIGHT (m): ?

DAM LENGTH (m): ?

DAM WIDTH (m): ?

LAKE LENGTH (m): 50,000 +

LAKE VOLUME (m^3): ?

TIME TO FAILURE (days): 3

FAILURE MECHANISM: ?

BREACH DIMENSIONS: ?

CONTROLS: -

DAM MATERIALS: ?

REFERENCES: Li and others, 1986.

COMMENTS: When dam breached, flooding occurred for several hundred kilometers downstream.

07/15/91

COUNTRY: China

SUBDIVISION: Xizang Autonomous Region (Tibet)

DATE: 1981; 7/11

RIVER OR LAKE: Boqu River

TYPE OF LANDSLIDE: Flow, debris

TRIGGER: Dam failure

LANDSLIDE VOLUME (m^3): 1,000,000

DAM TYPE: ?

DAM HEIGHT (m): ?

DAM LENGTH (m): ?

DAM WIDTH (m): ?

LAKE LENGTH (m): ?

LAKE VOLUME (m^3): ?

TIME TO FAILURE (days): <1

FAILURE MECHANISM: ?

BREACH DIMENSIONS: ?

CONTROLS: -

DAM MATERIALS: ?

REFERENCES: Xu Daoming, 1985.

COMMENTS: Debris flow from moraine-dam failure in Zhangzangbo gully tributary dammed Boqu River. Debris flow continued down river 50 km to town of Sun Kosi.

07/15/91

COUNTRY: China

SUBDIVISION: Yunnan Province

DATE: 1985 (summer)

RIVER OR LAKE: Xiao River

TYPE OF LANDSLIDE: Flow, debris

TRIGGER: Rainfall

LANDSLIDE VOLUME (m^3): ?

DAM TYPE: III

DAM HEIGHT (m): ?

DAM LENGTH (m): ?

DAM WIDTH (m): ?

LAKE LENGTH (m): ?

LAKE VOLUME (m^3): ?

TIME TO FAILURE (days): 0.01

FAILURE MECHANISM: Overtopping

BREACH DIMENSIONS: ?

CONTROLS: -

DAM MATERIALS: ?

REFERENCES: Wieczorek and others, 1987.

COMMENTS: Debris flow from Dabaini Ravine.

07/15/91

COUNTRY: China

SUBDIVISION: Yunnan Province, Jiangjia Gully

DATE: 1919

RIVER OR LAKE: Xiao River

TYPE OF LANDSLIDE: Flow, debris

TRIGGER: Rainfall

LANDSLIDE VOLUME (m^3): ?

DAM TYPE: III

DAM HEIGHT (m): 10 - 11

DAM LENGTH (m): ?

DAM WIDTH (m): ?

LAKE LENGTH (m): 10,000

LAKE VOLUME (m^3): ?

TIME TO FAILURE (days): 48

FAILURE MECHANISM: Overtopping

BREACH DIMENSIONS: ?

CONTROLS: -

DAM MATERIALS: ?

REFERENCES: Li and others, 1986.

COMMENTS: Debris flow from Jiangjia Gully during summer typhoons dammed Xiao River. Flooded agricultural land.

07/15/91

COUNTRY: China

SUBDIVISION: Yunnan Province, Jiangjia Gully

DATE: 1937

RIVER OR LAKE: Xiao River

TYPE OF LANDSLIDE: Flow, debris

TRIGGER: Rainfall

LANDSLIDE VOLUME (m^3): ?

DAM TYPE: III

DAM HEIGHT (m): ?

DAM LENGTH (m): ?

DAM WIDTH (m): ?

LAKE LENGTH (m): 10,000

LAKE VOLUME (m^3): ?

TIME TO FAILURE (days): 40

FAILURE MECHANISM: Overtopping

BREACH DIMENSIONS: ?

CONTROLS: -

DAM MATERIALS: ?

REFERENCES: Li and others, 1986.

COMMENTS: Debris flow from Jiangjia Gully during summer typhoon season dammed Xiao River. Flooded agricultural land.

07/15/91

COUNTRY: China

SUBDIVISION: Yunnan Province, Jiangjia Gully

DATE: 1949

RIVER OR LAKE: Xiao River

TYPE OF LANDSLIDE: Flow, debris

TRIGGER: Rainfall

LANDSLIDE VOLUME (m^3): ?

DAM TYPE: III

DAM HEIGHT (m): ?

DAM LENGTH (m): ?

DAM WIDTH (m): ?

LAKE LENGTH (m): ?

LAKE VOLUME (m^3): ?

TIME TO FAILURE (days): 30

FAILURE MECHANISM: Overtopping

BREACH DIMENSIONS: ?

CONTROLS: -

DAM MATERIALS: ?

REFERENCES: Li and others, 1986.

COMMENTS: Debris flow from Jiangjia Gully during summer typhoon season dammed Xiao River. Flooded agricultural land.

07/15/91

COUNTRY: China

SUBDIVISION: Yunnan Province, Jiangjia Gully

DATE: 1954

RIVER OR LAKE: Xiao River

TYPE OF LANDSLIDE: Flow, debris

TRIGGER: Rainfall

LANDSLIDE VOLUME (m^3): ?

DAM TYPE: III

DAM HEIGHT (m): 10

DAM LENGTH (m): ?

DAM WIDTH (m): ?

LAKE LENGTH (m): 9,000

LAKE VOLUME (m^3): ?

TIME TO FAILURE (days): 20

FAILURE MECHANISM: Overtopping

BREACH DIMENSIONS: ?

CONTROLS: -

DAM MATERIALS: ?

REFERENCES: Li and others, 1986.

COMMENTS: Debris flow from Jiangjia Gully during summer typhoon season dammed Xiao River. Flooded agricultural land.

07/15/91

COUNTRY: China

SUBDIVISION: Yunnan Province, Jiangjia Gully

DATE: 1961

RIVER OR LAKE: Xiao River

TYPE OF LANDSLIDE: Flow, debris

TRIGGER: Rainfall

LANDSLIDE VOLUME (m^3): ?

DAM TYPE: III

DAM HEIGHT (m): 9.5

DAM LENGTH (m): ?

DAM WIDTH (m): ?

LAKE LENGTH (m): ?

LAKE VOLUME (m^3): ?

TIME TO FAILURE (days): 10

FAILURE MECHANISM: Overtopping

BREACH DIMENSIONS: ?

CONTROLS: -

DAM MATERIALS: ?

REFERENCES: Li and others, 1986.

COMMENTS: Debris flow from Jiangjia Gully during summer typhoon season dammed Xiao River. Flooded agricultural land.

07/15/91

COUNTRY: China

SUBDIVISION: Yunnan Province, Jiangjia Gully

DATE: 1964

RIVER OR LAKE: Xiao River

TYPE OF LANDSLIDE: Flow, debris

TRIGGER: Rainfall

LANDSLIDE VOLUME (m^3): ?

DAM TYPE: III

DAM HEIGHT (m): ?

DAM LENGTH (m): ?

DAM WIDTH (m): ?

LAKE LENGTH (m): ?

LAKE VOLUME (m^3): ?

TIME TO FAILURE (days): 10

FAILURE MECHANISM: Overtopping

BREACH DIMENSIONS: ?

CONTROLS: -

DAM MATERIALS: ?

REFERENCES: Li and others, 1986.

COMMENTS: Debris flow from Jiangjia Gully during summer typhoon season dammed Xiao River. Flooded agricultural land.

07/15/91

COUNTRY: China

SUBDIVISION: Yunnan Province, Jiangjia Gully

DATE: 1968

RIVER OR LAKE: Xiao River

TYPE OF LANDSLIDE: Flow, debris

TRIGGER: Rainfall

LANDSLIDE VOLUME (m^3): ?

DAM TYPE: III

DAM HEIGHT (m): 10

DAM LENGTH (m): ?

DAM WIDTH (m): ?

LAKE LENGTH (m): 10,000

LAKE VOLUME (m^3): ?

TIME TO FAILURE (days): 180

FAILURE MECHANISM: Overtopping

BREACH DIMENSIONS: ?

CONTROLS: -

DAM MATERIALS: ?

REFERENCES: Li and others, 1986.

COMMENTS: Debris flow from Jiangjia Gully during summer typhoon season dammed Xiao River. Flooded agricultural land.

07/15/91

COUNTRY: China

SUBDIVISION: Yunnan Province, N of Daguan

DATE: 1917; 7/31

RIVER OR LAKE: Daguan River

TYPE OF LANDSLIDE: ?

TRIGGER: Earthquake

LANDSLIDE VOLUME (m^3): ?

DAM TYPE: ?

DAM HEIGHT (m): ?

DAM LENGTH (m): ?

DAM WIDTH (m): ?

LAKE LENGTH (m): ?

LAKE VOLUME (m^3): ?

TIME TO FAILURE (days): ?

FAILURE MECHANISM: ?

BREACH DIMENSIONS: ?

CONTROLS: ?

DAM MATERIALS: ?

REFERENCES: Guu, 1979.

COMMENTS: Landslide along both embankments blocked the river; water "flowed backward" for more than 5 km.

07/15/91

COUNTRY: Colombia

SUBDIVISION: Boyaca State, 4 km SW of Paz del Rio

DATE: 1979; 12/10

RIVER OR LAKE: Chicamocha River

TYPE OF LANDSLIDE: Slump

TRIGGER: Rainfall

LANDSLIDE VOLUME (m^3): 14,200,000

DAM TYPE: VI

DAM HEIGHT (m): 15

DAM LENGTH (m): 100

DAM WIDTH (m): 600

LAKE LENGTH (m): 3,000

LAKE VOLUME (m^3): ?

TIME TO FAILURE (days): Did not fail.

FAILURE MECHANISM: -

BREACH DIMENSIONS: -

CONTROLS: Channel outlet dug along toe of landslide dam.

DAM MATERIALS: Claystone interbedded with sandstone.

REFERENCES: Alvarado and others, 1987; Garcia Lopez and Reyes Chittaro, 1989.

COMMENTS: -

07/15/91

COUNTRY: Colombia

SUBDIVISION: Tolima State

DATE: 1984; 11/7

RIVER OR LAKE: Lagunilla River

TYPE OF LANDSLIDE: Slide, rock

TRIGGER: Rainfall

LANDSLIDE VOLUME (m^3): ?

DAM TYPE: II

DAM HEIGHT (m): 25

DAM LENGTH (m): ?

DAM WIDTH (m): ?

LAKE LENGTH (m): 1,500 (20 m wide)

LAKE VOLUME (m^3): 1,300,000

TIME TO FAILURE (days): 365

FAILURE MECHANISM: Overtopping (by Ruiz volcano lahar)

BREACH DIMENSIONS: ?

CONTROLS: -

DAM MATERIALS: ?

REFERENCES: Herd, 1986; Garcia Lopez, 1988.

COMMENTS: This dam was breached by debris flow from Ruiz volcano, contributed water to debris flow that wiped out Armero, 15 km downstream.

07/15/91

COUNTRY: Czechoslovakia

SUBDIVISION: Stredoslovensky Region, near Handlova

DATE: 1961; 1/?

RIVER OR LAKE: Handlovka River

TYPE OF LANDSLIDE: Flow, earth

TRIGGER: Rainfall

LANDSLIDE VOLUME (m^3): 20,000,000

DAM TYPE: I

DAM HEIGHT (m): 5 - 8

DAM LENGTH (m): 200

DAM WIDTH (m): 300

LAKE LENGTH (m): ?

LAKE VOLUME (m^3): ?

TIME TO FAILURE (days): ?

FAILURE MECHANISM: ?

BREACH DIMENSIONS: ?

CONTROLS: ?

DAM MATERIALS: Volcanic rock debris; clayey and silty sediments.

REFERENCES: Zaruba and Mencl, 1982.

COMMENTS: -

07/15/91

COUNTRY: Czechoslovakia

SUBDIVISION: Zapadocesky Region, near Mladotice

DATE: 1872

RIVER OR LAKE: ?

TYPE OF LANDSLIDE: Slide, rock

TRIGGER: Rainfall

LANDSLIDE VOLUME (m^3): 6,000,000

DAM TYPE: II

DAM HEIGHT (m): 25

DAM LENGTH (m): ?

DAM WIDTH (m): ?

LAKE LENGTH (m): 700

LAKE VOLUME (m^3): ?

TIME TO FAILURE (days): ?

FAILURE MECHANISM: ?

BREACH DIMENSIONS: ?

CONTROLS: ?

DAM MATERIALS: Arkose and sandstone.

REFERENCES: Zaruba and Mencl, 1982.

COMMENTS: -

07/15/91

COUNTRY: Ecuador

SUBDIVISION: Napo Province

DATE: 1987; 3/6

RIVER OR LAKE: Coca River

TYPE OF LANDSLIDE: Flow, debris

TRIGGER: Earthquake

LANDSLIDE VOLUME (m^3): ?

DAM TYPE: III

DAM HEIGHT (m): 15

DAM LENGTH (m): ?

DAM WIDTH (m): ?

LAKE LENGTH (m): ?

LAKE VOLUME (m^3): ?

TIME TO FAILURE (days): 0.1

FAILURE MECHANISM: Overtopping

BREACH DIMENSIONS: ?

CONTROLS: -

DAM MATERIALS: Sand, gravel, timber debris

REFERENCES: R.L. Schuster, personal observation, 1987.

COMMENTS: Dam formed by debris flow issuing from mouth of the Malo River.

07/15/91

COUNTRY: Ecuador

SUBDIVISION: Pichincha Province

DATE: 1990; 1/2

RIVER OR LAKE: Pisque River

TYPE OF LANDSLIDE: Slump, earth

TRIGGER: Human-caused (irrigation seepage)

LANDSLIDE VOLUME (m^3): 1,800,000

DAM TYPE: II

DAM HEIGHT (m): 56

DAM LENGTH (m): 60

DAM WIDTH (m): 300

LAKE LENGTH (m): 2600

LAKE VOLUME (m^3): 3,600,000 (Max depth = 45 m)

TIME TO FAILURE (days): 24

FAILURE MECHANISM: Overtopping

BREACH DIMENSIONS: ?

CONTROLS: Spillway dug by bulldozers.

DAM MATERIALS: Soft tuff, breccia, and pumice.

REFERENCES: Plaza-Nieto and others, 1990.

COMMENTS: Failed by headward erosion along man-made spillway. When lake depth reached 35 m, two dozers began cutting a spillway over the crest. Spillway overtopped at lake depth of 45 m, flood 10-15 m deep.

07/15/91

COUNTRY: France

SUBDIVISION: Drome Department

DATE: 1442

RIVER OR LAKE: Drome River

TYPE OF LANDSLIDE: Avalanche, rock

TRIGGER: Earthquake ?

LANDSLIDE VOLUME (m^3): 2,000,000

DAM TYPE: V

DAM HEIGHT (m): ?

DAM LENGTH (m): 600

DAM WIDTH (m): ?

LAKE LENGTH (m): 8,000

LAKE VOLUME (m^3): ?

TIME TO FAILURE (days): Did not fail.

FAILURE MECHANISM: -

BREACH DIMENSIONS: -

CONTROLS: -

DAM MATERIALS: Rock debris and very large blocks.

REFERENCES: Montandon, 1933; Ramirez and others, 1988.

COMMENTS: Avalanche split into two branches which dammed the Drome River in two places, forming a small (6 ha) and a large lake. Dried up in 18th century.

07/15/91

COUNTRY: France

SUBDIVISION: Drome Department, Luc-en-Diois

DATE: 100 - 200

RIVER OR LAKE: Drome River

TYPE OF LANDSLIDE: Avalanche, rock

TRIGGER: ?

LANDSLIDE VOLUME (m^3): ?

DAM TYPE: ?

DAM HEIGHT (m): ?

DAM LENGTH (m): ?

DAM WIDTH (m): ?

LAKE LENGTH (m): ?

LAKE VOLUME (m^3): ?

TIME TO FAILURE (days): ?

FAILURE MECHANISM: ?

BREACH DIMENSIONS: ?

CONTROLS: ?

DAM MATERIALS: ?

REFERENCES: Mougin, 1931; Montandon, 1933.

COMMENTS: Ancient town of Luc was inundated by waters behind the landslide dam.

07/15/91

COUNTRY: France

SUBDIVISION: Haute Savoie Department, Arve Valley

DATE: "Early Christian era"

RIVER OR LAKE: Arve River

TYPE OF LANDSLIDE: Slide, rock

TRIGGER: ?

LANDSLIDE VOLUME (m^3): ?

DAM TYPE: ?

DAM HEIGHT (m): ?

DAM LENGTH (m): ?

DAM WIDTH (m): ?

LAKE LENGTH (m): ?

LAKE VOLUME (m^3): ?

TIME TO FAILURE (days): ?

FAILURE MECHANISM: ?

BREACH DIMENSIONS: ?

CONTROLS: -

DAM MATERIALS: Limestone debris ?

REFERENCES: Eisbacher and Clague, 1984, p. 142-143.

COMMENTS: Dam failed in 13th cent., wiping out St. Denis.

07/15/91

COUNTRY: France

SUBDIVISION: Haute Savoie Department, Chablais

DATE: 1943; 3/12

RIVER OR LAKE: Brevon Torrent; Lake Vallon

TYPE OF LANDSLIDE: Slump /flow, earth

TRIGGER: Snowmelt

LANDSLIDE VOLUME (m^3): 2,000,000

DAM TYPE: ?

DAM HEIGHT (m): ?

DAM LENGTH (m): ?

DAM WIDTH (m): ?

LAKE LENGTH (m): 1,000

LAKE VOLUME (m^3): ?

TIME TO FAILURE (days): ?

FAILURE MECHANISM: Overtopping

BREACH DIMENSIONS: ?

CONTROLS: -

DAM MATERIALS: Intensely deformed limestone and shale.

REFERENCES: Eisbacher and Clague, 1984, p. 118-119.

COMMENTS: Little damage when failed; lake still there.

07/15/91

COUNTRY: France

SUBDIVISION: Haute Savoie Department, Lullin

DATE: 1635; 4/11

RIVER OR LAKE: Grand-Creux stream

TYPE OF LANDSLIDE: ?

TRIGGER: ?

LANDSLIDE VOLUME (m^3): ?

DAM TYPE: ?

DAM HEIGHT (m): ?

DAM LENGTH (m): ?

DAM WIDTH (m): ?

LAKE LENGTH (m): ?

LAKE VOLUME (m^3): ?

TIME TO FAILURE (days): ?

FAILURE MECHANISM: ?

BREACH DIMENSIONS: ?

CONTROLS: ?

DAM MATERIALS: ?

REFERENCES: Montandon, 1933.

COMMENTS: Failure of dam caused debris flow that badly damaged village of Lullin, 1 km downstream.

07/15/91

COUNTRY: France

SUBDIVISION: Haute-Savoie Department, near Servoz

DATE: 1471; 2/?

RIVER OR LAKE: Arve River

TYPE OF LANDSLIDE: Avalanche, rock

TRIGGER: ?

LANDSLIDE VOLUME (m^3): ? (area = 7 sq km)

DAM TYPE: ?

DAM HEIGHT (m): ?

DAM LENGTH (m): ?

DAM WIDTH (m): ?

LAKE LENGTH (m): ?

LAKE VOLUME (m^3): ?

TIME TO FAILURE (days): Did not fail.

FAILURE MECHANISM: -

BREACH DIMENSIONS: -

CONTROLS: Emergency spillway dug across dam.

DAM MATERIALS: Tertiary limestone and shale.

REFERENCES: Montandon, 1933.

COMMENTS: Backed-up waters thretened to flood village of Servoz, but after frantic work a passage was opened for the river in the middle of the debris.

07/15/91

COUNTRY: France

SUBDIVISION: Haute-Savoie Department, near Sixt

DATE: 1602; 2/21

RIVER OR LAKE: Giffre River

TYPE OF LANDSLIDE: Avalanche, debris

TRIGGER: Rainfall and snowmelt

LANDSLIDE VOLUME (m^3): ?

DAM TYPE: ?

DAM HEIGHT (m): ?

DAM LENGTH (m): ?

DAM WIDTH (m): ?

LAKE LENGTH (m): ?

LAKE VOLUME (m^3): ?

TIME TO FAILURE (days): ?

FAILURE MECHANISM: ?

BREACH DIMENSIONS: ?

CONTROLS: ?

DAM MATERIALS: Limestone debris.

REFERENCES: Montandon, 1933.

COMMENTS: Material dammed the Giffre, and the backed-up waters later rushed down the valley, which was devastated as far as the lock at Tines.

07/15/91

COUNTRY: France

SUBDIVISION: Isere Department, Grenoble

DATE: 1219; 9/14

RIVER OR LAKE: Isere River

TYPE OF LANDSLIDE: Flow, debris

TRIGGER: Dam failure

LANDSLIDE VOLUME (m^3): ?

DAM TYPE: ?

DAM HEIGHT (m): ?

DAM LENGTH (m): ?

DAM WIDTH (m): ?

LAKE LENGTH (m): 8,000

LAKE VOLUME (m^3): ?

TIME TO FAILURE (days): ?

FAILURE MECHANISM: ?

BREACH DIMENSIONS: ?

CONTROLS: ?

DAM MATERIALS: Alluvium

REFERENCES: Montandon, 1933.

COMMENTS: Lake formed by this dam flooded part of Grenoble. Romanche River dammed by landslide in 1191. Caused by debris-flow dam failure on Romanche River.

07/15/91

COUNTRY: France

SUBDIVISION: Isere Department, N of Livet

DATE: 1465; 8/4

RIVER OR LAKE: Romanche River; Lake St. Laurent

TYPE OF LANDSLIDE: ?

TRIGGER: Rainfall

LANDSLIDE VOLUME (m^3): ?

DAM TYPE: ?

DAM HEIGHT (m): 15 - 18

DAM LENGTH (m): ?

DAM WIDTH (m): ?

LAKE LENGTH (m): ?

LAKE VOLUME (m^3): ?

TIME TO FAILURE (days): ?

FAILURE MECHANISM: ?

BREACH DIMENSIONS: ?

CONTROLS: ?

DAM MATERIALS: ?

REFERENCES: Montandon, 1933.

COMMENTS: Lake St. Laurent rose until it covered almost entire Plain of Oisans.

07/15/91

COUNTRY: France

SUBDIVISION: Isere Department, N of Livet

DATE: 1612; 8/7

RIVER OR LAKE: Romanche River; Lake St. Laurent

TYPE OF LANDSLIDE: ? •

TRIGGER: ?

LANDSLIDE VOLUME (m^3): ?

DAM TYPE: ?

DAM HEIGHT (m): ?

DAM LENGTH (m): ?

DAM WIDTH (m): ?

LAKE LENGTH (m): ?

LAKE VOLUME (m^3): ?

TIME TO FAILURE (days): 4

FAILURE MECHANISM: ?

BREACH DIMENSIONS: ?

CONTROLS: Breached artificially.

DAM MATERIALS: ?

REFERENCES: Montandon, 1933.

COMMENTS: Lake St. Laurent formed again on Oisans Plain. 40 workers breached the dam, and flood on Aug 11 carried away the Gavet bridge.

07/15/91

COUNTRY: France

SUBDIVISION: Isere Department, NE of Livet

DATE: 1191; 8/10

RIVER OR LAKE: Romanche River; St. Laurent Lake

TYPE OF LANDSLIDE: Avalanche, rock /flow, debris

TRIGGER: ?

LANDSLIDE VOLUME (m^3): ?

DAM TYPE: II

DAM HEIGHT (m): 10 - 15

DAM LENGTH (m): ?

DAM WIDTH (m): ?

LAKE LENGTH (m): 15,000

LAKE VOLUME (m^3): ?

TIME TO FAILURE (days): 10,220

FAILURE MECHANISM: Erosion of downstream face.

BREACH DIMENSIONS: ?

CONTROLS: -

DAM MATERIALS: Debris from amphibolite bedrock.

REFERENCES: Montandon, 1933; Eisbacher and Clague, 1984, p. 85.

COMMENTS: 1191 rock avalanche/debris flow formed higher dam that raised level of pre-existing St. Laurent Lake by 10-15 m. Half of Grenoble flooded.

07/15/91

COUNTRY: France

SUBDIVISION: Savoie Department, Bec Rouge

DATE: 1877; 6-7/?

RIVER OR LAKE: St. Claude Torrent

TYPE OF LANDSLIDE: Avalanche, rock

TRIGGER: Snowmelt

LANDSLIDE VOLUME (m^3): 3,000,000

DAM TYPE: ?

DAM HEIGHT (m): ?

DAM LENGTH (m): ?

DAM WIDTH (m): 500

LAKE LENGTH (m): ?

LAKE VOLUME (m^3): ?

TIME TO FAILURE (days): 1825

FAILURE MECHANISM: ?

BREACH DIMENSIONS: ?

CONTROLS: -

DAM MATERIALS: Broken up conglomerate, quartzite, slate.

REFERENCES: Mougin, 1931; Montandon, 1933; Eisbacher and Clague, 1984, p. 179

COMMENTS: At first, water seeped through dam, but overtopping and erosion occurred on Aug 30, 1882; Jun 3, 1883; Sep 16, 1883; Jul 20, 1895.

07/15/91

COUNTRY: France

SUBDIVISION: Savoie Department, Bourg-St. Maurice

DATE: 163

RIVER OR LAKE: Isere River

TYPE OF LANDSLIDE: Flow, debris

TRIGGER: Rainfall

LANDSLIDE VOLUME (m^3): ?

DAM TYPE: ?

DAM HEIGHT (m): ?

DAM LENGTH (m): ?

DAM WIDTH (m): ?

LAKE LENGTH (m): ?

LAKE VOLUME (m^3): ?

TIME TO FAILURE (days): ?

FAILURE MECHANISM: ?

BREACH DIMENSIONS: ?

CONTROLS: ?

DAM MATERIALS: ?

REFERENCES: Montandon, 1933.

COMMENTS: Flooding from failure of dam.

07/15/91

COUNTRY: France

SUBDIVISION: Savoie Department, Bourg-St. Maurice

DATE: 1732; 9/30

RIVER OR LAKE: Isere River

TYPE OF LANDSLIDE: Flow, debris

TRIGGER: Rainfall and snowmelt

LANDSLIDE VOLUME (m^3): ?

DAM TYPE: ?

DAM HEIGHT (m): ?

DAM LENGTH (m): ?

DAM WIDTH (m): ?

LAKE LENGTH (m): ?

LAKE VOLUME (m^3): ?

TIME TO FAILURE (days): ?

FAILURE MECHANISM: ?

BREACH DIMENSIONS: ?

CONTROLS: -

DAM MATERIALS: ?

REFERENCES: Montandon, 1933; Eisbacher and Clague, 1984, p. 120

COMMENTS: All mills on banks of the Isere River were submerged; all bridges as far as Grenoble were swept away except for one.

07/15/91

COUNTRY: France

SUBDIVISION: Savoie Department, Isere Valley, S of Salins

DATE: 1450

RIVER OR LAKE: Doron River

TYPE OF LANDSLIDE: ?

TRIGGER: ?

LANDSLIDE VOLUME (m^3): 70,000

DAM TYPE: ?

DAM HEIGHT (m): ?

DAM LENGTH (m): ?

DAM WIDTH (m): ?

LAKE LENGTH (m): ?

LAKE VOLUME (m^3): ?

TIME TO FAILURE (days): ?

FAILURE MECHANISM: ?

BREACH DIMENSIONS: ?

CONTROLS: ?

DAM MATERIALS: Gypsiferous rock.

REFERENCES: Montandon, 1933; Eisbacher and Clague, 1984, p. 194.

COMMENTS: Failure of dam caused one of the great inundations suffered by Moutiers in the Middle Ages.

07/15/91

COUNTRY: France

SUBDIVISION: Savoie Department, Le Chatelard

DATE: 1000 - 1100

RIVER OR LAKE: Cheran River

TYPE OF LANDSLIDE: Slide, rock

TRIGGER: ?

LANDSLIDE VOLUME (m^3): 3,000,000

DAM TYPE: ?

DAM HEIGHT (m): 20

DAM LENGTH (m): ?

DAM WIDTH (m): ?

LAKE LENGTH (m): ?

LAKE VOLUME (m^3): ?

TIME TO FAILURE (days): ?

FAILURE MECHANISM: ?

BREACH DIMENSIONS: ?

CONTROLS: ?

DAM MATERIALS: Carbonate and argillaceous rocks.

REFERENCES: Montandon, 1933; Eisbacher and Clague, 1984, p. 203.

COMMENTS: Blocked flow of Cheran River, forming "temporary lake" in vicinity of villages of Compote and Ecole.

07/15/91

COUNTRY: France

SUBDIVISION: Savoie Department, Orelle

DATE: 1740; 12/20-22

RIVER OR LAKE: Arc River

TYPE OF LANDSLIDE: Flow, debris

TRIGGER: Rainfall

LANDSLIDE VOLUME (m^3): ?

DAM TYPE: ?

DAM HEIGHT (m): ?

DAM LENGTH (m): ?

DAM WIDTH (m): ?

LAKE LENGTH (m): ?

LAKE VOLUME (m^3): ?

TIME TO FAILURE (days): ?

FAILURE MECHANISM: ?

BREACH DIMENSIONS: ?

CONTROLS: -

DAM MATERIALS: ?

REFERENCES: Montandon, 1933; Eisbacher and Clague, 1984, p. 97-98.

COMMENTS: Dam on Arc River "drowned several buildings".

07/15/91

COUNTRY: Guatemala

SUBDIVISION: 15 km SW of Tecpan

DATE: 1976; 2/4

RIVER OR LAKE: Los Chocoyos River

TYPE OF LANDSLIDE: Avalanche, debris

TRIGGER: Earthquake

LANDSLIDE VOLUME (m^3): 750,000 - 1,000,000

DAM TYPE: III

DAM HEIGHT (m): 20 - 50

DAM LENGTH (m): 300 - 400

DAM WIDTH (m): 800

LAKE LENGTH (m): 300

LAKE VOLUME (m^3): ?

TIME TO FAILURE (days): Did not fail.

FAILURE MECHANISM: -

BREACH DIMENSIONS: -

CONTROLS: Channel excavated through dam.

DAM MATERIALS: Pleistocene pumice.

REFERENCES: Harp and others, 1981.

COMMENTS: Channel widened and deepened by erosion; lake completely drained by June 1976; no flooding.

07/15/91

COUNTRY: Guatemala

SUBDIVISION: 2 km NE of San Jose Poaquil

DATE: 1976; 2/4

RIVER OR LAKE: Teculcheya River

TYPE OF LANDSLIDE: Slump /avalanche, debris

TRIGGER: Earthquake

LANDSLIDE VOLUME (m^3): 3,500,000

DAM TYPE: III

DAM HEIGHT (m): 15

DAM LENGTH (m): ?

DAM WIDTH (m): 1,200

LAKE LENGTH (m): 1,000

LAKE VOLUME (m^3): ?

TIME TO FAILURE (days): 143

FAILURE MECHANISM: ?

BREACH DIMENSIONS: ?

CONTROLS: -

DAM MATERIALS: Welded tuff covered by pumice.

REFERENCES: Harp and others, 1981.

COMMENTS: -

07/15/91

COUNTRY: Guatemala

SUBDIVISION: 2 km SW of San Martin Jilotepeque

DATE: 1976; 2/4

RIVER OR LAKE: Quemaya River

TYPE OF LANDSLIDE: Slump

TRIGGER: Earthquake

LANDSLIDE VOLUME (m^3): 2,000,000

DAM TYPE: II

DAM HEIGHT (m): 50

DAM LENGTH (m): ?

DAM WIDTH (m): 400

LAKE LENGTH (m): 250

LAKE VOLUME (m^3): ?

TIME TO FAILURE (days): ?

FAILURE MECHANISM: Overtopping

BREACH DIMENSIONS: ?

CONTROLS: Landslide trenched to drain lake. Drained too fast, causing flood.

DAM MATERIALS: Pumice deposits.

REFERENCES: Harp and others, 1981.

COMMENTS: Flood from trenching drowned several people in village 3 km downstream.

07/15/91

COUNTRY: Guatemala

SUBDIVISION: Estancia de la Virgen

DATE: 1976; 2/4

RIVER OR LAKE: Pixcaya River

TYPE OF LANDSLIDE: Avalanche, debris

TRIGGER: Earthquake

LANDSLIDE VOLUME (m^3): 6,000,000

DAM TYPE: II

DAM HEIGHT (m): 20

DAM LENGTH (m): 200

DAM WIDTH (m): 600

LAKE LENGTH (m): 800

LAKE VOLUME (m^3): ?

TIME TO FAILURE (days): Several days

FAILURE MECHANISM: ?

BREACH DIMENSIONS: ?

CONTROLS: -

DAM MATERIALS: Tertiary andesite overlain by pumice.

REFERENCES: Harp and others, 1981.

COMMENTS: Dam was breached several days after earthquake.

07/15/91

COUNTRY: Hungary

SUBDIVISION: Borsod-Abauj-Zemplen County

DATE: 1863; 1910; 1929

RIVER OR LAKE: Szohony Stream; Arlo Lake

TYPE OF LANDSLIDE: Slide, rotational

TRIGGER: Human-caused (mining)

LANDSLIDE VOLUME (m^3): 5,000,000

DAM TYPE: II

DAM HEIGHT (m): 90

DAM LENGTH (m): 100

DAM WIDTH (m): 400

LAKE LENGTH (m): 650

LAKE VOLUME (m^3): 150,000 (presently)

TIME TO FAILURE (days): Did not fail.

FAILURE MECHANISM: -

BREACH DIMENSIONS: -

CONTROLS: Spillway dug; then drainage pipes.

DAM MATERIALS: Miocene clay.

REFERENCES: Peja, 1956; Fogarasi, 1983.

COMMENTS: Three separate landslides at same site. Spillway dug after 1863 slide, but filled by subsequent slide. Then drainage pipes installed. Cause of landslides was coal mining.

07/15/91

COUNTRY: India

SUBDIVISION: Assam State

DATE: 1950; 8/15

RIVER OR LAKE: Dihang River (also dammed Dibang River)

TYPE OF LANDSLIDE: ?

TRIGGER: Earthquake

LANDSLIDE VOLUME (m^3): ?

DAM TYPE: ?

DAM HEIGHT (m): ?

DAM LENGTH (m): ?

DAM WIDTH (m): ?

LAKE LENGTH (m): ?

LAKE VOLUME (m^3): ?

TIME TO FAILURE (days): 0.08

FAILURE MECHANISM: ?

BREACH DIMENSIONS: ?

CONTROLS: ?

DAM MATERIALS: ?

REFERENCES: Poddar, 1952.

COMMENTS: -

07/15/91

COUNTRY: India

SUBDIVISION: Assam State

DATE: 1950; 8/15

RIVER OR LAKE: Tiding River

TYPE OF LANDSLIDE: ?

TRIGGER: Earthquake

LANDSLIDE VOLUME (m^3): ?

DAM TYPE: ?

DAM HEIGHT (m): 25

DAM LENGTH (m): ?

DAM WIDTH (m): ?

LAKE LENGTH (m): ?

LAKE VOLUME (m^3): ?

TIME TO FAILURE (days): ?

FAILURE MECHANISM: ?

BREACH DIMENSIONS: ?

CONTROLS: ?

DAM MATERIALS: ?

REFERENCES: Poddar, 1952.

COMMENTS: -

07/15/91

COUNTRY: India

SUBDIVISION: Assam State

DATE: 1950; 8/15

RIVER OR LAKE: Subansiri River

TYPE OF LANDSLIDE: ?

TRIGGER: Earthquake

LANDSLIDE VOLUME (m^3): ?

DAM TYPE: ?

DAM HEIGHT (m): ?

DAM LENGTH (m): ?

DAM WIDTH (m): ?

LAKE LENGTH (m): ?

LAKE VOLUME (m^3): ?

TIME TO FAILURE (days): 4

FAILURE MECHANISM: ?

BREACH DIMENSIONS: ?

CONTROLS: ?

DAM MATERIALS: ?

REFERENCES: Poddar, 1952.

COMMENTS: 500 killed.

07/15/91

COUNTRY: India

SUBDIVISION: Assam State

DATE: 1950; 8/15

RIVER OR LAKE: Luhit River tributary

TYPE OF LANDSLIDE: Avalanche, rock and debris

TRIGGER: Earthquake

LANDSLIDE VOLUME (m^3): ?

DAM TYPE: ?

DAM HEIGHT (m): ?

DAM LENGTH (m): ?

DAM WIDTH (m): ?

LAKE LENGTH (m): ?

LAKE VOLUME (m^3): ?

TIME TO FAILURE (days): 7

FAILURE MECHANISM: ?

BREACH DIMENSIONS: ?

CONTROLS: ?

DAM MATERIALS: ?

REFERENCES: Gibbs, 1961.

COMMENTS: -

07/15/91

COUNTRY: India

SUBDIVISION: Assam State (in hills N of Kamrup District)

DATE: 1897; 6/12

RIVER OR LAKE: Scob River

TYPE OF LANDSLIDE: ?

TRIGGER: Earthquake

LANDSLIDE VOLUME (m^3): ?

DAM TYPE: ?

DAM HEIGHT (m): ?

DAM LENGTH (m): ?

DAM WIDTH (m): ?

LAKE LENGTH (m): ?

LAKE VOLUME (m^3): ?

TIME TO FAILURE (days): 87

FAILURE MECHANISM: ?

BREACH DIMENSIONS: ?

CONTROLS: ?

DAM MATERIALS: ?

REFERENCES: Oldham, 1899.

COMMENTS: -

07/15/91

COUNTRY: India

SUBDIVISION: Assam State, Mishmi Hills, Minutang

DATE: 1948; 9/8

RIVER OR LAKE: Delei River

TYPE OF LANDSLIDE: ?

TRIGGER: Rainfall

LANDSLIDE VOLUME (m^3): ?

DAM TYPE: ?

DAM HEIGHT (m): 46

DAM LENGTH (m): ?

DAM WIDTH (m): ?

LAKE LENGTH (m): ?

LAKE VOLUME (m^3): ?

TIME TO FAILURE (days): 2.5

FAILURE MECHANISM: Overtopping

BREACH DIMENSIONS: ?

CONTROLS: -

DAM MATERIALS: Granite, gneiss, boulders, cobbles, sand.

REFERENCES: Dey, 1962.

COMMENTS: Small lake remains; implication is slow erosion of dam by river in period of 2.5 days; heavy rain in 3 years before slide: 3250; 4060; 4140 mm/yr.

07/15/91

COUNTRY: India

SUBDIVISION: Himachal Pradesh State, Kotla

DATE: 1905; 4/4

RIVER OR LAKE: Tirthan River; Lake Barwar.

TYPE OF LANDSLIDE: Avalanche, rock

TRIGGER: Earthquake

LANDSLIDE VOLUME (m^3): ?

DAM TYPE: ?

DAM HEIGHT (m): 20 - 25

DAM LENGTH (m): ?

DAM WIDTH (m): ?

LAKE LENGTH (m): 1,200 (100-200 m wide)

LAKE VOLUME (m^3): ?

TIME TO FAILURE (days): 450

FAILURE MECHANISM: Overtopping

BREACH DIMENSIONS: ?

CONTROLS: ?

DAM MATERIALS: Rock debris.

REFERENCES: Middlemiss, 1910

COMMENTS: By summer of 1906, no lake remained.

07/15/91

COUNTRY: India

SUBDIVISION: Kashmir State

DATE: 1975; 1/19

RIVER OR LAKE: Para Chu River

TYPE OF LANDSLIDE: ?

TRIGGER: Earthquake

LANDSLIDE VOLUME (m^3): ?

DAM TYPE: ?

DAM HEIGHT (m): 20

DAM LENGTH (m): ?

DAM WIDTH (m): ?

LAKE LENGTH (m): ?

LAKE VOLUME (m^3): ?

TIME TO FAILURE (days): 9

FAILURE MECHANISM: ?

BREACH DIMENSIONS: ?

CONTROLS: ?

DAM MATERIALS: Loose rocks and moraine material.

REFERENCES: Bapat, 1980.

COMMENTS: Caused sedimentation.

07/15/91

COUNTRY: India

SUBDIVISION: North Bengal State

DATE: ?

RIVER OR LAKE: Teesta River

TYPE OF LANDSLIDE: ?

TRIGGER: Rainfall

LANDSLIDE VOLUME (m^3): ?

DAM TYPE: ?

DAM HEIGHT (m): ?

DAM LENGTH (m): ?

DAM WIDTH (m): ?

LAKE LENGTH (m): ?

LAKE VOLUME (m^3): ?

TIME TO FAILURE (days): ? (failed 10/4/68)

FAILURE MECHANISM: ?

BREACH DIMENSIONS: ?

CONTROLS: ?

DAM MATERIALS: ?

REFERENCES: Singh and others, 1974.

COMMENTS: River stage rose to 20.4 m above "extreme danger level" at Anderson Bridge. Town of Jalpaiguri was flooded to a depth of 2-3 m, resulting in large number of deaths and heavy deposition of sediment.

07/15/91

COUNTRY: India

SUBDIVISION: Uttar Pradesh State

DATE: ?

RIVER OR LAKE: Alaknanda River

TYPE OF LANDSLIDE: ?

TRIGGER: Rainfall

LANDSLIDE VOLUME (m^3): ?

DAM TYPE: ?

DAM HEIGHT (m): ?

DAM LENGTH (m): ?

DAM WIDTH (m): ?

LAKE LENGTH (m): ?

LAKE VOLUME (m^3): ?

TIME TO FAILURE (days): ? (failed 7/70).

FAILURE MECHANISM: ?

BREACH DIMENSIONS: ?

CONTROLS: -

DAM MATERIALS: ?

REFERENCES: Singh and others, 1974.

COMMENTS: 15 m deep in village, many deaths.

07/15/91

COUNTRY: India

SUBDIVISION: Uttar Pradesh State

DATE: 1890's

RIVER OR LAKE: Pauri Ganga River; Lake Bonatal

TYPE OF LANDSLIDE: Slide, rock

TRIGGER: Undercutting

LANDSLIDE VOLUME (m^3): ?

DAM TYPE: ?

DAM HEIGHT (m): 350

DAM LENGTH (m): ?

DAM WIDTH (m): ?

LAKE LENGTH (m): ?

LAKE VOLUME (m^3): ?

TIME TO FAILURE (days): Did not fail.

FAILURE MECHANISM: -

BREACH DIMENSIONS: -

CONTROLS: ?

DAM MATERIALS: Broken dolomite and limestone.

REFERENCES: Krishnaswamy, 1980b.

COMMENTS: -

07/15/91

COUNTRY: India

SUBDIVISION: Uttar Pradesh State

DATE: 1970; 7/20

RIVER OR LAKE: Alaknanda River

TYPE OF LANDSLIDE: Slide, rock/flow, debris

TRIGGER: Rainfall

LANDSLIDE VOLUME (m^3): ?

DAM TYPE: ?

DAM HEIGHT (m): 60

DAM LENGTH (m): ?

DAM WIDTH (m): ?

LAKE LENGTH (m): ?

LAKE VOLUME (m^3): ?

TIME TO FAILURE (days): ?

FAILURE MECHANISM: ?

BREACH DIMENSIONS: ?

CONTROLS: ?

DAM MATERIALS: ?

REFERENCES: Krishnawamy and Jain, 1975, p. 26; Krishnaswamy, 1980a.

COMMENTS: Debris flow came from tributary Patalganga River which built a debris cone across river.

07/15/91

COUNTRY: India

SUBDIVISION: Uttar Pradesh State

DATE: 1978; 8/?

RIVER OR LAKE: Bhagirathi River

TYPE OF LANDSLIDE: Flow, debris

TRIGGER: ?

LANDSLIDE VOLUME (m^3): ?

DAM TYPE: ?

DAM HEIGHT (m): 30

DAM LENGTH (m): ?

DAM WIDTH (m): ?

LAKE LENGTH (m): ?

LAKE VOLUME (m^3): ?

TIME TO FAILURE (days): ?

FAILURE MECHANISM: ?

BREACH DIMENSIONS: ?

CONTROLS: ?

DAM MATERIALS: ?

REFERENCES: Krishnaswamy, 1980a.

COMMENTS: Debris flow from Kanauldhia Ghad River. Top 25 m breached, leaving small lake, 1.5 km long and 20 m deep. Don't know when breach occurred.

07/15/91

COUNTRY: India

SUBDIVISION: Uttar Pradesh State, Chamoli District

DATE: 1968; 2/4

RIVER OR LAKE: Rishiganga River, trib. of Dhauliganga River

TYPE OF LANDSLIDE: Slide, rock /avalanche, rock

TRIGGER: ?

LANDSLIDE VOLUME (m^3): ?

DAM TYPE: II

DAM HEIGHT (m): 40

DAM LENGTH (m): 117

DAM WIDTH (m): 183

LAKE LENGTH (m): 1,000 (150 m wide)

LAKE VOLUME (m^3): ?

TIME TO FAILURE (days): 900

FAILURE MECHANISM: ?

BREACH DIMENSIONS: ?

CONTROLS: ?

DAM MATERIALS: Broken gneiss; mainly large boulders, some 15 m diameter.

REFERENCES: Gupta, 1974; Krishnaswamy and Jain, 1975; Krishnawamy, 1980a.

COMMENTS: At first, water ran right through dam because composed of mainly boulders. Later, silt plugged voids, and real dam formed with lake behind it.

07/15/91

COUNTRY: India

SUBDIVISION: Uttar Pradesh State, Garwhal District

DATE: 1893; 9/22

RIVER OR LAKE: Birehi Ganga River; Gohna Lake

TYPE OF LANDSLIDE: Slide, rock

TRIGGER: Rainfall

LANDSLIDE VOLUME (m^3): ?

DAM TYPE: III

DAM HEIGHT (m): 274

DAM LENGTH (m): 760

DAM WIDTH (m): 2,750

LAKE LENGTH (m): 3,930

LAKE VOLUME (m^3): 460,000,000

TIME TO FAILURE (days): 338

FAILURE MECHANISM: Overtopping (with seepage)

BREACH DIMENSIONS: ?

CONTROLS: ?

DAM MATERIALS: Dolomite blocks, boulders, other fine debris.

REFERENCES: Holland, 1894; Lubbock, 1894; Strachey, 1894; Glass, 1896; Frizell, 1906; Barrows, 1948; Gupta, 1974.

COMMENTS: Caused huge flood. Slate beds dipping 45-50 deg. into valley. Gupta says 8/9/94, large slip occurred, heavy percolation.

07/15/91

COUNTRY: Indonesia

SUBDIVISION: Irian Jaya

DATE: 1981; 1/19

RIVER OR LAKE: Solo River

TYPE OF LANDSLIDE: Flow, debris

TRIGGER: Earthquake

LANDSLIDE VOLUME (m^3): 100,000

DAM TYPE: III

DAM HEIGHT (m): 10

DAM LENGTH (m): 30

DAM WIDTH (m): 200

LAKE LENGTH (m): 800

LAKE VOLUME (m^3): 100,000

TIME TO FAILURE (days): 16

FAILURE MECHANISM: ?

BREACH DIMENSIONS: ?

CONTROLS: -

DAM MATERIALS: ?

REFERENCES: Letz, 1981.

COMMENTS: -

07/15/91

COUNTRY: Indonesia

SUBDIVISION: Irian Jaya, Kurima District

DATE: 1989; 8/2

RIVER OR LAKE: Baliem River

TYPE OF LANDSLIDE: ?

TRIGGER: Earthquake

LANDSLIDE VOLUME (m^3): ?

DAM TYPE: ?

DAM HEIGHT (m): ?

DAM LENGTH (m): ?

DAM WIDTH (m): ?

LAKE LENGTH (m): ?

LAKE VOLUME (m^3): ?

TIME TO FAILURE (days): ?

FAILURE MECHANISM: ?

BREACH DIMENSIONS: ?

CONTROLS: ?

DAM MATERIALS: ?

REFERENCES: Associated Press, 1989.

COMMENTS: "Mud and earth piled 650 feet high were blocking the Bailem River". "Fears the river would burst through and flood nearby villages."

07/15/91

COUNTRY: Indonesia

SUBDIVISION: Java Island

DATE: 1006

RIVER OR LAKE: ?

TYPE OF LANDSLIDE: Slump, rock

TRIGGER: ?

LANDSLIDE VOLUME (m^3): ?

DAM TYPE: ?

DAM HEIGHT (m): ?

DAM LENGTH (m): ?

DAM WIDTH (m): ?

LAKE LENGTH (m): ?

LAKE VOLUME (m^3): ?

TIME TO FAILURE (days): ?

FAILURE MECHANISM: ?

BREACH DIMENSIONS: ?

CONTROLS: -

DAM MATERIALS: Volcanics.

REFERENCES: Holmes, 1965.

COMMENTS: Failure of SW part of cone of Merapi Volcano.

07/15/91

COUNTRY: Ireland

SUBDIVISION: Galway County, Dunmore

DATE: 1745; 3/28

RIVER OR LAKE: Clare River

TYPE OF LANDSLIDE: Slide, peat

TRIGGER: Rainfall

LANDSLIDE VOLUME (m^3): ?

DAM TYPE: ?

DAM HEIGHT (m): ?

DAM LENGTH (m): ?

DAM WIDTH (m): ?

LAKE LENGTH (m): ?

LAKE VOLUME (m^3): ? (area = 1.2 sq km)

TIME TO FAILURE (days): ?

FAILURE MECHANISM: ?

BREACH DIMENSIONS: ?

CONTROLS: Dug spillway.

DAM MATERIALS: Peat.

REFERENCES: Ousley, 1788.

COMMENTS: Only known example of peatslide-forming dam.

07/15/91

COUNTRY: Israel

SUBDIVISION: North of Damiya

DATE: -1250 B.C.

RIVER OR LAKE: Jordan River

TYPE OF LANDSLIDE: ?

TRIGGER: Earthquake

LANDSLIDE VOLUME (m^3): ?

DAM TYPE: ?

DAM HEIGHT (m): ?

DAM LENGTH (m): ?

DAM WIDTH (m): ?

LAKE LENGTH (m): ?

LAKE VOLUME (m^3): ?

TIME TO FAILURE (days): ?

FAILURE MECHANISM: ?

BREACH DIMENSIONS: ?

CONTROLS: -

DAM MATERIALS: Marl.

REFERENCES: Bentor, 1989.

COMMENTS: -

07/15/91

COUNTRY: Israel

SUBDIVISION: North of Damiya

DATE: 1267; 12/8

RIVER OR LAKE: Jordan River

TYPE OF LANDSLIDE: ?

TRIGGER: ?

LANDSLIDE VOLUME (m^3): ?

DAM TYPE: ?

DAM HEIGHT (m): ?

DAM LENGTH (m): ?

DAM WIDTH (m): ?

LAKE LENGTH (m): ?

LAKE VOLUME (m^3): ?

TIME TO FAILURE (days): 0.2

FAILURE MECHANISM: ?

BREACH DIMENSIONS: ?

CONTROLS: -

DAM MATERIALS: Marl.

REFERENCES: Watson, 1895; Bentor, 1989.

COMMENTS: Landslide occurred in a marl gorge.

07/15/91

COUNTRY: Israel

SUBDIVISION: North of Damiya

DATE: 1546

RIVER OR LAKE: Jordan River

TYPE OF LANDSLIDE: ?

TRIGGER: Earthquake

LANDSLIDE VOLUME (m^3): ?

DAM TYPE: ?

DAM HEIGHT (m): ?

DAM LENGTH (m): ?

DAM WIDTH (m): ?

LAKE LENGTH (m): ?

LAKE VOLUME (m^3): ?

TIME TO FAILURE (days): 2

FAILURE MECHANISM: ?

BREACH DIMENSIONS: ?

CONTROLS: -

DAM MATERIALS: Lisan marls.

REFERENCES: Braslavski, 1938; Bentor, 1989.

COMMENTS: Banks of the Jordan River caved in due to the earthquake.

07/15/91

COUNTRY: Israel

SUBDIVISION: North of Damiya

DATE: 1927

RIVER OR LAKE: Jordan River

TYPE OF LANDSLIDE: ?

TRIGGER: Earthquake

LANDSLIDE VOLUME (m^3): ?

DAM TYPE: ?

DAM HEIGHT (m): ?

DAM LENGTH (m): ?

DAM WIDTH (m): ?

LAKE LENGTH (m): ?

LAKE VOLUME (m^3): ?

TIME TO FAILURE (days): 1 ("several hours")

FAILURE MECHANISM: ?

BREACH DIMENSIONS: ?

CONTROLS: -

DAM MATERIALS: Marl.

REFERENCES: Braslavski, 1938; Bentor, 1989.

COMMENTS: "Mudslide" into the river following the 1927 earthquake.

07/15/91

COUNTRY: Israel

SUBDIVISION: near Jericho (north of Damiya)

DATE: 1906

RIVER OR LAKE: Jordan River

TYPE OF LANDSLIDE: ?

TRIGGER: Earthquake

LANDSLIDE VOLUME (m^3): ?

DAM TYPE: ?

DAM HEIGHT (m): ?

DAM LENGTH (m): ?

DAM WIDTH (m): ?

LAKE LENGTH (m): ?

LAKE VOLUME (m^3): ?

TIME TO FAILURE (days): 1

FAILURE MECHANISM: ?

BREACH DIMENSIONS: ?

CONTROLS: -

DAM MATERIALS: ?

REFERENCES: Ben-Menahem, 1976.

COMMENTS: -

07/15/91

COUNTRY: Italy

SUBDIVISION: Calabria Region

DATE: 1783; 2/5-6

RIVER OR LAKE: Lindo River; Lake San Bruno

TYPE OF LANDSLIDE: Slide, earth

TRIGGER: Earthquake

LANDSLIDE VOLUME (m^3): ?

DAM TYPE: IV

DAM HEIGHT (m): 32

DAM LENGTH (m): 80

DAM WIDTH (m): ?

LAKE LENGTH (m): 1,380

LAKE VOLUME (m^3): ?

TIME TO FAILURE (days): Did not fail.

FAILURE MECHANISM: -

BREACH DIMENSIONS: -

CONTROLS: Drained by artificial channel.

DAM MATERIALS: Pliocene sandy marly clays.

REFERENCES: Cotecchia and others, 1969, 1986.

COMMENTS: -

07/15/91

COUNTRY: Italy

SUBDIVISION: Calabria Region

DATE: 1783; 2/5-6

RIVER OR LAKE: Marro River; Lake Marro

TYPE OF LANDSLIDE: Slide, earth

TRIGGER: Earthquake

LANDSLIDE VOLUME (m^3): ?

DAM TYPE: II

DAM HEIGHT (m): 34

DAM LENGTH (m): ?

DAM WIDTH (m): ?

LAKE LENGTH (m): 1,000

LAKE VOLUME (m^3): ?

TIME TO FAILURE (days): ?

FAILURE MECHANISM: ?

BREACH DIMENSIONS: ?

CONTROLS: ?

DAM MATERIALS: Pliocene sandy, marly clays.

REFERENCES: Cotecchia and others, 1969, 1986.

COMMENTS: -

07/15/91

COUNTRY: Italy

SUBDIVISION: Calabria Region

DATE: 1783; 2/5-6

RIVER OR LAKE: Riganati Stream; Lake Birbo

TYPE OF LANDSLIDE: Slide, earth

TRIGGER: Earthquake

LANDSLIDE VOLUME (m^3): ?

DAM TYPE: II

DAM HEIGHT (m): 31

DAM LENGTH (m): ?

DAM WIDTH (m): ?

LAKE LENGTH (m): 820

LAKE VOLUME (m^3): ?

TIME TO FAILURE (days): ?

FAILURE MECHANISM: ?

BREACH DIMENSIONS: ?

CONTROLS: ?

DAM MATERIALS: Pliocene sandy, marly clays.

REFERENCES: Cotecchia and others, 1969, 1986.

COMMENTS: -

07/15/91

COUNTRY: Italy

SUBDIVISION: Calabria Region

DATE: 1783; 2/5-6

RIVER OR LAKE: Serra Torrent; Lake Cucco

TYPE OF LANDSLIDE: Slide, earth

TRIGGER: Earthquake

LANDSLIDE VOLUME (m^3): ?

DAM TYPE: II

DAM HEIGHT (m): 17

DAM LENGTH (m): 100

DAM WIDTH (m): ?

LAKE LENGTH (m): 535

LAKE VOLUME (m^3): ?

TIME TO FAILURE (days): ?

FAILURE MECHANISM: ?

BREACH DIMENSIONS: ?

CONTROLS: ?

DAM MATERIALS: Pliocene sandy marly clays.

REFERENCES: Cotecchia and others, 1969, 1986.

COMMENTS: -

07/15/91

COUNTRY: Italy

SUBDIVISION: Calabria Region

DATE: 1783; 2/5-6

RIVER OR LAKE: Lago Stream; Lake Cumi

TYPE OF LANDSLIDE: Slide, earth

TRIGGER: Earthquake

LANDSLIDE VOLUME (m^3): ?

DAM TYPE: IV

DAM HEIGHT (m): 41

DAM LENGTH (m): ?

DAM WIDTH (m): ?

LAKE LENGTH (m): 1,300

LAKE VOLUME (m^3): ?

TIME TO FAILURE (days): ?

FAILURE MECHANISM: ?

BREACH DIMENSIONS: ?

CONTROLS: ?

DAM MATERIALS: Pliocene sandy, marly clays.

REFERENCES: Cotecchia and others, 1969, 1986.

COMMENTS: -

07/15/91

COUNTRY: Italy

SUBDIVISION: Calabria Region

DATE: 1783; 2/5-6

RIVER OR LAKE: Lago Stream; Lake Santa Cristina

TYPE OF LANDSLIDE: Slide, earth

TRIGGER: Earthquake

LANDSLIDE VOLUME (m^3): ?

DAM TYPE: II

DAM HEIGHT (m): 52

DAM LENGTH (m): ?

DAM WIDTH (m): ?

LAKE LENGTH (m): 1,250

LAKE VOLUME (m^3): ?

TIME TO FAILURE (days): ?

FAILURE MECHANISM: Overtopping

BREACH DIMENSIONS: ?

CONTROLS: Dam was emptied in 1823.

DAM MATERIALS: Pliocene sandy, marly clays.

REFERENCES: Cotecchia and others, 1969, 1986.

COMMENTS: Horizontal distance of slide was not less than 500 m; dam was artifically raised but spillway continued to cut lower and lower.

07/15/91

COUNTRY: Italy

SUBDIVISION: Calabria Region

DATE: 1783; 2/5-6

RIVER OR LAKE: Tricucio River; Lake Tricucio

TYPE OF LANDSLIDE: Slide, earth

TRIGGER: Earthquake

LANDSLIDE VOLUME (m^3): ?

DAM TYPE: II

DAM HEIGHT (m): 19

DAM LENGTH (m): ?

DAM WIDTH (m): ?

LAKE LENGTH (m): 1,065

LAKE VOLUME (m^3): ?

TIME TO FAILURE (days): ?

FAILURE MECHANISM: Overtopping

BREACH DIMENSIONS: ?

CONTROLS: ?

DAM MATERIALS: Pliocene sandy, marly clays.

REFERENCES: Cotecchia and others, 1969, 1986.

COMMENTS: -

07/15/91

COUNTRY: Italy

SUBDIVISION: Calabria Region

DATE: 1783; 2/5-6

RIVER OR LAKE: Duverso Torrent; Lake Speziale

TYPE OF LANDSLIDE: Slide, earth

TRIGGER: Earthquake

LANDSLIDE VOLUME (m^3): ?

DAM TYPE: IV

DAM HEIGHT (m): 12

DAM LENGTH (m): 100

DAM WIDTH (m): ?

LAKE LENGTH (m): 470

LAKE VOLUME (m^3): ?

TIME TO FAILURE (days): Did not fail.

FAILURE MECHANISM: ?

BREACH DIMENSIONS: ?

CONTROLS: Partially drained by artificial channel.

DAM MATERIALS: Pliocene sandy marly clays.

REFERENCES: Cotecchia and others, 1969, 1986.

COMMENTS: -

07/15/91

COUNTRY: Italy

SUBDIVISION: Calabria Region

DATE: 1783; 2/5-6

RIVER OR LAKE: Duverso Torrent; Lake Coluce ed Arena

TYPE OF LANDSLIDE: Slide, earth

TRIGGER: Earthquake

LANDSLIDE VOLUME (m^3): ?

DAM TYPE: II

DAM HEIGHT (m): 26

DAM LENGTH (m): 170

DAM WIDTH (m): ?

LAKE LENGTH (m): 830

LAKE VOLUME (m^3): ?

TIME TO FAILURE (days): Did not fail.

FAILURE MECHANISM: -

BREACH DIMENSIONS: -

CONTROLS: Partially drained by artificial channel.

DAM MATERIALS: Pliocene sandy marly clays.

REFERENCES: Cotecchia and others, 1969, 1986.

COMMENTS: -

07/15/91

COUNTRY: Italy

SUBDIVISION: Calabria Region

DATE: 1973; 1/?

RIVER OR LAKE: Buonamico River headwaters

TYPE OF LANDSLIDE: Avalanche, rock

TRIGGER: Rainfall

LANDSLIDE VOLUME (m^3): ?

DAM TYPE: ?

DAM HEIGHT (m): 20

DAM LENGTH (m): ?

DAM WIDTH (m): ?

LAKE LENGTH (m): ?

LAKE VOLUME (m^3): ?

TIME TO FAILURE (days): 0.5 (a few hours)

FAILURE MECHANISM: Overtopping

BREACH DIMENSIONS: ?

CONTROLS: -

DAM MATERIALS: ?

REFERENCES: M. Sorriso-Valvo, National Research Council of Italy, unpub. data, 1988.

COMMENTS: 834 mm of rain in 4 days.

07/15/91

COUNTRY: Italy

SUBDIVISION: Calabria Region

DATE: 1973; 1/3-4

RIVER OR LAKE: Buonamico River; Lake Costantino

TYPE OF LANDSLIDE: Slide, rock /avalanche, rock

TRIGGER: Rainfall

LANDSLIDE VOLUME (m^3): 21,000,000

DAM TYPE: II

DAM HEIGHT (m): 90

DAM LENGTH (m): 400

DAM WIDTH (m): 700

LAKE LENGTH (m): 1,200

LAKE VOLUME (m^3): 7,500,000

TIME TO FAILURE (days): 31

FAILURE MECHANISM: Piping

BREACH DIMENSIONS: 50 m deep

CONTROLS: -

DAM MATERIALS: Gneissic rock debris.

REFERENCES: Guerricchio and Melidoro, 1973; Sorriso-Valvo, 1984; Ergenzinger, 1988.

COMMENTS: Partial failure raised river bed 30 m just downstream of dam; 10 m 2 km farther downstream. 920 mm rain in 3 days.

07/15/91

COUNTRY: Italy

SUBDIVISION: Calabria Region (2 km N of Coseleto)

DATE: 1783; 2/5-6

RIVER OR LAKE: Lindo River; Lake Lindo

TYPE OF LANDSLIDE: Slide, earth

TRIGGER: Earthquake

LANDSLIDE VOLUME (m^3): ?

DAM TYPE: II

DAM HEIGHT (m): 4

DAM LENGTH (m): ?

DAM WIDTH (m): ?

LAKE LENGTH (m): 60

LAKE VOLUME (m^3): ?

TIME TO FAILURE (days): ?

FAILURE MECHANISM: Overtopping

BREACH DIMENSIONS: ?

CONTROLS: ?

DAM MATERIALS: Pliocene sandy, marly clays.

REFERENCES: Cotecchia and others, 1969, 1986.

COMMENTS: -

07/15/91

COUNTRY: Italy

SUBDIVISION: Calabria Region, NE of Seminara

DATE: 1783; 2/5-6

RIVER OR LAKE: Lake Passo

TYPE OF LANDSLIDE: Slide, earth

TRIGGER: Earthquake

LANDSLIDE VOLUME (m^3): ?

DAM TYPE: II

DAM HEIGHT (m): 14

DAM LENGTH (m): ?

DAM WIDTH (m): ?

LAKE LENGTH (m): 380

LAKE VOLUME (m^3): ?

TIME TO FAILURE (days): ?

FAILURE MECHANISM: ?

BREACH DIMENSIONS: ?

CONTROLS: ?

DAM MATERIALS: Pliocene sandy, marly clays.

REFERENCES: Cotecchia and others, 1969, 1986.

COMMENTS: -

07/15/91

COUNTRY: Italy

SUBDIVISION: Calabria Region, NE of Seminara

DATE: 1783; 2/5-6

RIVER OR LAKE: Lake Tofilo

TYPE OF LANDSLIDE: Slide, earth

TRIGGER: Earthquake

LANDSLIDE VOLUME (m^3): ?

DAM TYPE: II

DAM HEIGHT (m): 18

DAM LENGTH (m): ?

DAM WIDTH (m): ?

LAKE LENGTH (m): 620

LAKE VOLUME (m^3): ?

TIME TO FAILURE (days): ?

FAILURE MECHANISM: ?

BREACH DIMENSIONS: ?

CONTROLS: ?

DAM MATERIALS: Pliocene sandy, marly clays.

REFERENCES: Cotecchia and others, 1969, 1986.

COMMENTS: -

07/15/91

COUNTRY: Italy

SUBDIVISION: Friuli-Venezia-Giulia Region, Piave Valley

DATE: 1963; 10/9

RIVER OR LAKE: Viaont Torrent

TYPE OF LANDSLIDE: Slide, rock

TRIGGER: Rainfall and reservoir seepage

LANDSLIDE VOLUME (m^3): 250,000,000

DAM TYPE: II

DAM HEIGHT (m): 275

DAM LENGTH (m): 1,000

DAM WIDTH (m): 1,800

LAKE LENGTH (m): 5,000

LAKE VOLUME (m^3): ?

TIME TO FAILURE (days): ?

FAILURE MECHANISM: ?

BREACH DIMENSIONS: ?

CONTROLS: -

DAM MATERIALS: Limestone.

REFERENCES: Broili, 1967; Muller, 1968; Hendron and Patton, 1985.

COMMENTS: Landslide dam bypassed by tunnel.

07/15/91

COUNTRY: Italy

SUBDIVISION: Friuli-Venezia-Giulia Region, north of Udine

DATE: 1896; 10/20

RIVER OR LAKE: Alba River

TYPE OF LANDSLIDE: Slide, rock

TRIGGER: ?

LANDSLIDE VOLUME (m^3): ?

DAM TYPE: ?

DAM HEIGHT (m): ?

DAM LENGTH (m): ?

DAM WIDTH (m): ?

LAKE LENGTH (m): ?

LAKE VOLUME (m^3): ?

TIME TO FAILURE (days): 1,460

FAILURE MECHANISM: ?

BREACH DIMENSIONS: ?

CONTROLS: ?

DAM MATERIALS: Dolomitic limestone.

REFERENCES: Montandon, 1933.

COMMENTS: Lake emptied in 1900.

07/15/91

COUNTRY: Italy

SUBDIVISION: Friuli-Venezia-Giulia Region, west of Tolmezzo

DATE: 1692; 8/15

RIVER OR LAKE: Tagliamento River

TYPE OF LANDSLIDE: Avalanche, rock

TRIGGER: Rainfall

LANDSLIDE VOLUME (m^3): 30,000,000

DAM TYPE: ?

DAM HEIGHT (m): 80

DAM LENGTH (m): 625

DAM WIDTH (m): 1,100

LAKE LENGTH (m): 7,000

LAKE VOLUME (m^3): ? (area = 1.6 sq km)

TIME TO FAILURE (days): 50

FAILURE MECHANISM: Overtopping (partial failure)

BREACH DIMENSIONS: ?

CONTROLS: -

DAM MATERIALS: Dolomite debris.

REFERENCES: Montandon, 1933; Eisbacher and Clague, 1984, p. 226-227; Friz, E., 1990, Personal commun, ISMES, Bergamo, It

COMMENTS: Lake overflowed in two bursts on Oct 4 and Oct 20, 1692. Good sketches in Eisbacher and Clague.

07/15/91

COUNTRY: Italy

SUBDIVISION: Lombardia Region, Val Bregaglia, Piuro

DATE: 1618; 9/4

RIVER OR LAKE: Mera River

TYPE OF LANDSLIDE: Avalanche, rock and debris

TRIGGER: Rainfall

LANDSLIDE VOLUME (m^3): 3,000,000 - 4,000,000

DAM TYPE: ?

DAM HEIGHT (m): ?

DAM LENGTH (m): ?

DAM WIDTH (m): ?

LAKE LENGTH (m): ?

LAKE VOLUME (m^3): ?

TIME TO FAILURE (days): Did not fail.

FAILURE MECHANISM: -

BREACH DIMENSIONS: -

CONTROLS: -

DAM MATERIALS: Gneiss and amphibolite debris.

REFERENCES: Heim, 1932; Montandon, 1933; Eisbacher and Clague, 1984, p. 114-116.

COMMENTS: Large lake formed, but dam didn't fail when overtopped. 1200 people killed by landslide.

07/15/91

COUNTRY: Italy

SUBDIVISION: Lombardia Region, Val Codera

DATE: 1988; 7/14

RIVER OR LAKE: Codera stream

TYPE OF LANDSLIDE: Flow, debris

TRIGGER: Rainfall

LANDSLIDE VOLUME (m^3): ?

DAM TYPE: ?

DAM HEIGHT (m): 3

DAM LENGTH (m): ?

DAM WIDTH (m): ?

LAKE LENGTH (m): 200 (60 m wide)

LAKE VOLUME (m^3): ? (depth = 3 m)

TIME TO FAILURE (days): Did not fail.

FAILURE MECHANISM: -

BREACH DIMENSIONS: -

CONTROLS: Spillway constructed by forestry people.

DAM MATERIALS: -

REFERENCES: Republica, 1988.

COMMENTS: -

07/15/91

COUNTRY: Italy

SUBDIVISION: Lombardia Region, Val Serina

DATE: 1888; 9/13

RIVER OR LAKE: Ambria Stream

TYPE OF LANDSLIDE: Slide, rock

TRIGGER: Rainfall

LANDSLIDE VOLUME (m^3): ?

DAM TYPE: ?

DAM HEIGHT (m): 15

DAM LENGTH (m): ?

DAM WIDTH (m): ?

LAKE LENGTH (m): 400

LAKE VOLUME (m^3): ?

TIME TO FAILURE (days): ?

FAILURE MECHANISM: ?

BREACH DIMENSIONS: ?

CONTROLS: ?

DAM MATERIALS: ?

REFERENCES: Montandon, 1933.

COMMENTS: -

07/15/91

COUNTRY: Italy

SUBDIVISION: Lombardia Region, Valtellina

DATE: 1987; 7/28

RIVER OR LAKE: Adda River; Val Pola Lake

TYPE OF LANDSLIDE: Avalanche, debris

TRIGGER: Rainfall and undercutting

LANDSLIDE VOLUME (m^3): 35,000,000

DAM TYPE: III

DAM HEIGHT (m): 33

DAM LENGTH (m): 2,700

DAM WIDTH (m): 550

LAKE LENGTH (m): 2,900

LAKE VOLUME (m^3): 22,000,000

TIME TO FAILURE (days): Did not fail.

FAILURE MECHANISM: -

BREACH DIMENSIONS: -

CONTROLS: Pumps, then two large drainage tunnels through bedrock.

DAM MATERIALS: Gabbro, diorite, gneiss rocks and debris; 1-2 m size on surface.

REFERENCES: Cambiaghi and Schuster, 1989; Govi, 1989; Costa, 1991.

COMMENTS: Debris fan from Val Pola dammed Adda River 8 days prior, forming small lake. Water was displaced by avalanche, moved 2.7 km upstream, 20 killed.

07/15/91

COUNTRY: Italy

SUBDIVISION: Lombardia Region, Valtellina, Tirano

DATE: 1807; 12/7

RIVER OR LAKE: Adda River

TYPE OF LANDSLIDE: Slump, rock

TRIGGER: Rainfall

LANDSLIDE VOLUME (m^3): ?

DAM TYPE: ?

DAM HEIGHT (m): ?

DAM LENGTH (m): ?

DAM WIDTH (m): ?

LAKE LENGTH (m): ?

LAKE VOLUME (m^3): ?

TIME TO FAILURE (days): 180

FAILURE MECHANISM: Overtopping; aided by spring snowmelt

BREACH DIMENSIONS: ?

CONTROLS: -

DAM MATERIALS: Schist.

REFERENCES: Eisbacher and Clague, 1984, p. 160.

COMMENTS: Lake drowned several small settlements upstream from Sernio; original landslide caused by seepage of water into cracks due to rainfall.

07/15/91

COUNTRY: Italy

SUBDIVISION: Piemonte Region, Antronapiana

DATE: 1642; 7/27

RIVER OR LAKE: Ovesca Torrent; Lake Antronapiana

TYPE OF LANDSLIDE: Avalanche, rock

TRIGGER: ?

LANDSLIDE VOLUME (m^3): 12,000,000

DAM TYPE: ?

DAM HEIGHT (m): 45

DAM LENGTH (m): 650

DAM WIDTH (m): 1,500

LAKE LENGTH (m): 800

LAKE VOLUME (m^3): ? (area = 0.3 sq km)

TIME TO FAILURE (days): Did not fail.

FAILURE MECHANISM: -

BREACH DIMENSIONS: -

CONTROLS: -

DAM MATERIALS: Blocks of gneïss.

REFERENCES: Montandon, 1933, Eisbacher and Clague, 1984, p. 123-124; E. Friz, 1990, personal commun, ISMES, Bergamo, Ita

COMMENTS: Slight overflow but no real failure; formed Lake Antronapiana.

07/15/91

COUNTRY: Italy

SUBDIVISION: Piemonte Region, San Giovanni de Crevola

DATE: 1958; 8/20

RIVER OR LAKE: Diveria River

TYPE OF LANDSLIDE: Avalanche, rock and debris

TRIGGER: Rainfall

LANDSLIDE VOLUME (m^3): ?

DAM TYPE: ?

DAM HEIGHT (m): ?

DAM LENGTH (m): ?

DAM WIDTH (m): ?

LAKE LENGTH (m): ?

LAKE VOLUME (m^3): ?

TIME TO FAILURE (days): 1 (a short time)

FAILURE MECHANISM: ?

BREACH DIMENSIONS: ?

CONTROLS: -

DAM MATERIALS: Gneiss rock debris.

REFERENCES: Eisbacher and Clague, 1984, p. 210-211.

COMMENTS: "Debris dam yielded to pressure of the impounded water".

07/15/91

COUNTRY: Italy

SUBDIVISION: Trentino-Aldo Adige Region, Passiria Valley.

DATE: 1404

RIVER OR LAKE: Passiria River

TYPE OF LANDSLIDE: Slide, rock

TRIGGER: ?

LANDSLIDE VOLUME (m^3): ?

DAM TYPE: ?

DAM HEIGHT (m): 50

DAM LENGTH (m): ?

DAM WIDTH (m): ?

LAKE LENGTH (m): 1,000

LAKE VOLUME (m^3): ?

TIME TO FAILURE (days): 5,475

FAILURE MECHANISM: ?

BREACH DIMENSIONS: ?

CONTROLS: -

DAM MATERIALS: ?

REFERENCES: Eisbacher and Clague, 1984, p. 93-94.

COMMENTS: In 1419 major section of dam failed causing flood that killed at least 400, mostly in Merano. In 1772, breached again, and again in 1774.

07/15/91

COUNTRY: Italy

SUBDIVISION: Trentino-Aldo Adige Region, Valle di Vanoi

DATE: 1823 (fall)

RIVER OR LAKE: Vanoi Torrent

TYPE OF LANDSLIDE: Flow, debris

TRIGGER: Rainfall

LANDSLIDE VOLUME (m^3): ?

DAM TYPE: ?

DAM HEIGHT (m): ?

DAM LENGTH (m): ?

DAM WIDTH (m): ?

LAKE LENGTH (m): ?

LAKE VOLUME (m^3): ?

TIME TO FAILURE (days): 0.5 (more than 1 hour)

FAILURE MECHANISM: ?

BREACH DIMENSIONS: ?

CONTROLS: -

DAM MATERIALS: Phyllite, schist, granite debris.

REFERENCES: Eisbacher and Clague, 1984, p. 163-164.

COMMENTS: Much damage done downvalley when dam burst.

07/15/91

COUNTRY: Italy

SUBDIVISION: Trentino-Aldo Adige Region, Valle di Vanoi

DATE: 1825; 12/?

RIVER OR LAKE: Vanoi Torrent; Lake Nuevo

TYPE OF LANDSLIDE: Flow, debris

TRIGGER: ?

LANDSLIDE VOLUME (m^3): ?

DAM TYPE: ?

DAM HEIGHT (m): ?

DAM LENGTH (m): ?

DAM WIDTH (m): ?

LAKE LENGTH (m): ?

LAKE VOLUME (m^3): ?

TIME TO FAILURE (days): 150

FAILURE MECHANISM: ?

BREACH DIMENSIONS: ?

CONTROLS: -

DAM MATERIALS: ?

REFERENCES: Eisbacher and Clague, 1984, p. 163-164.

COMMENTS: Lake Nuevo drowned 36 houses (hamlet of Ponte);
May 1826 failure killed 52 people.

07/15/91

COUNTRY: Italy

SUBDIVISION: Trentino-Alto Adige Region, Aurina Valley

DATE: 1867; 9/14-15

RIVER OR LAKE: Aurina Torrent

TYPE OF LANDSLIDE: Flow, debris

TRIGGER: Rainfall

LANDSLIDE VOLUME (m^3): ?

DAM TYPE: ?

DAM HEIGHT (m): ?

DAM LENGTH (m): ?

DAM WIDTH (m): ?

LAKE LENGTH (m): ?

LAKE VOLUME (m^3): ?

TIME TO FAILURE (days): ?

FAILURE MECHANISM: ?

BREACH DIMENSIONS: ?

CONTROLS: -

DAM MATERIALS: ?

REFERENCES: Eisbacher and Clague, 1984, p. 180-181.

COMMENTS: Formed small lake. When barrier burst, deluge of mud and rock blanketed agricultural land.

07/15/91

COUNTRY: Italy

SUBDIVISION: Trentino-Alto Adige Region, Aurina Valley, Lutago

DATE: 1878; 8/17

RIVER OR LAKE: Rotbach Torrent

TYPE OF LANDSLIDE: Slump, rock /avalanche, debris

TRIGGER: Rainfall

LANDSLIDE VOLUME (m^3): 14,000,000

DAM TYPE: ?

DAM HEIGHT (m): ?

DAM LENGTH (m): ?

DAM WIDTH (m): ?

LAKE LENGTH (m): ?

LAKE VOLUME (m^3): ?

TIME TO FAILURE (days): 1

FAILURE MECHANISM: Overtopping

BREACH DIMENSIONS: ?

CONTROLS: Dam overtopped, but did not really fail - eroded away slowly.

DAM MATERIALS: ?

REFERENCES: Montandon, 1933; Eisbacher and Clague, 1984, p. 180-181.

COMMENTS: Hamlet of St. Martin was flooded by the lake.

07/15/91

COUNTRY: Italy

SUBDIVISION: Trentino-Alto Adige Region, Badia Valley

DATE: 1821; 6/19

RIVER OR LAKE: Gader Torrent; Sompunt Lake

TYPE OF LANDSLIDE: Flow, earth

TRIGGER: Snowmelt and rainfall

LANDSLIDE VOLUME (m^3): ?

DAM TYPE: ?

DAM HEIGHT (m): ?

DAM LENGTH (m): ?

DAM WIDTH (m): ?

LAKE LENGTH (m): 1,000

LAKE VOLUME (m^3): ?

TIME TO FAILURE (days): 2,200

FAILURE MECHANISM: Overtopping

BREACH DIMENSIONS: ?

CONTROLS: -

DAM MATERIALS: Shale and carbonate debris.

REFERENCES: Eisbacher and Clague, 1984, p. 162-163.

COMMENTS: -

07/15/91

COUNTRY: Italy

SUBDIVISION: Trentino-Alto Adige Region, Isarco Valley, Chiusa

DATE: 1921; 8/9

RIVER OR LAKE: Isarco River

TYPE OF LANDSLIDE: Flow, debris

TRIGGER: Rainfall

LANDSLIDE VOLUME (m^3): ?

DAM TYPE: ?

DAM HEIGHT (m): 7

DAM LENGTH (m): ?

DAM WIDTH (m): ?

LAKE LENGTH (m): ?

LAKE VOLUME (m^3): ?

TIME TO FAILURE (days): Several days.

FAILURE MECHANISM: ?

BREACH DIMENSIONS: ?

CONTROLS: -

DAM MATERIALS: Phyllite debris.

REFERENCES: Eisbacher and Clague, 1984, p. 200.

COMMENTS: -

07/15/91

COUNTRY: Italy

SUBDIVISION: Trentino-Alto Adige Region, Isarco Valley, Colma di Bar

DATE: 1891; 8/17-18

RIVER OR LAKE: Isarco River

TYPE OF LANDSLIDE: Flow, debris

TRIGGER: Rainfall

LANDSLIDE VOLUME (m^3): 500,000

DAM TYPE: ?

DAM HEIGHT (m): ?

DAM LENGTH (m): ?

DAM WIDTH (m): ?

LAKE LENGTH (m): 1,200

LAKE VOLUME (m^3): ?

TIME TO FAILURE (days): ?

FAILURE MECHANISM: ?

BREACH DIMENSIONS: ?

CONTROLS: 1000 people redirected river to old course.

DAM MATERIALS: ?

REFERENCES: Eisbacher and Clague, 1984, p. 188.

COMMENTS: Isarco River dammed by debris flow from Gonderbach Torrent.

07/15/91

COUNTRY: Italy

SUBDIVISION: Trentino-Alto Adige Region, Molveno

DATE: 200 - 1,000 A.D.

RIVER OR LAKE: Sarca River tributary

TYPE OF LANDSLIDE: Avalanche, rock

TRIGGER: ?

LANDSLIDE VOLUME (m^3): 375,000,000

DAM TYPE: ?

DAM HEIGHT (m): 130

DAM LENGTH (m): 1,500

DAM WIDTH (m): 3,250

LAKE LENGTH (m): 4,500

LAKE VOLUME (m^3): ? (area = 3.25 sq km)

TIME TO FAILURE (days): Did not fail.

FAILURE MECHANISM: -

BREACH DIMENSIONS: -

CONTROLS: -

DAM MATERIALS: Limestone and dolomite.

REFERENCES: E. Friz, 1990, personal commun., ISMES, Bergamo, Italy.

COMMENTS: This huge landslide appears to be mainly a rock avalanche. Dam did not fail. Molveno Lake still exists; data are for current dimensions of lake. Data presented here based on field studies by Friz.

07/15/91

COUNTRY: Italy

SUBDIVISION: Umbria Region

DATE: 1906; 7/27

RIVER OR LAKE: Nera River

TYPE OF LANDSLIDE: Flow, debris

TRIGGER: Rainfall

LANDSLIDE VOLUME (m^3): ?

DAM TYPE: ?

DAM HEIGHT (m): ?

DAM LENGTH (m): ?

DAM WIDTH (m): ?

LAKE LENGTH (m): ?

LAKE VOLUME (m^3): ?

TIME TO FAILURE (days): A few days.

FAILURE MECHANISM: Overtopping

BREACH DIMENSIONS: ?

CONTROLS: -

DAM MATERIALS: -

REFERENCES: Chienti e Potenza, 1906.

COMMENTS: Local priest said his father told him the lake lasted "only a few days".

07/15/91

COUNTRY: Italy

SUBDIVISION: Valle d'Aosta Region, Valley Veny

DATE: 1920; 11/?

RIVER OR LAKE: Dora di Veny

TYPE OF LANDSLIDE: Fall, rock /avalanche, rock

TRIGGER: ?

LANDSLIDE VOLUME (m^3): 4,500,000

DAM TYPE: ?

DAM HEIGHT (m): ?

DAM LENGTH (m): ?

DAM WIDTH (m): ?

LAKE LENGTH (m): ?

LAKE VOLUME (m^3): ?

TIME TO FAILURE (days): ?

FAILURE MECHANISM: ?

BREACH DIMENSIONS: ?

CONTROLS: -

DAM MATERIALS: Granitic debris.

REFERENCES: Eisbacher and Clague, 1984, p. 135.

COMMENTS: Started as rock fall, dam was rock avalanche; small lake formed.

07/15/91

COUNTRY: Italy

SUBDIVISION: Valle d'Aosta Region, Valpelline, Becca de Luseney

DATE: 1952; 6/8

RIVER OR LAKE: Buthier Torrent

TYPE OF LANDSLIDE: Flow, debris

TRIGGER: Snowmelt

LANDSLIDE VOLUME (m^3): ?

DAM TYPE: ?

DAM HEIGHT (m): ?

DAM LENGTH (m): ?

DAM WIDTH (m): ?

LAKE LENGTH (m): ?

LAKE VOLUME (m^3): ?

TIME TO FAILURE (days): 4

FAILURE MECHANISM: ?

BREACH DIMENSIONS: ?

CONTROLS: -

DAM MATERIALS: Metamorphic rock, moraine, ice.

REFERENCES: Eisbacher and Clague, 1984, p. 207.

COMMENTS: Small lake formed.

07/15/91

COUNTRY: Italy

SUBDIVISION: Veneto Region, Cordevole Valley, Lago di Alleghe

DATE: 1771; 1/11

RIVER OR LAKE: Cordevole Torrent; Lake of Alleghe

TYPE OF LANDSLIDE: Slide, rock /avalanche, rock

TRIGGER: ?

LANDSLIDE VOLUME (m^3): 20,000,000

DAM TYPE: II

DAM HEIGHT (m): 80

DAM LENGTH (m): 500

DAM WIDTH (m): 1,750

LAKE LENGTH (m): 4,000

LAKE VOLUME (m^3): ?

TIME TO FAILURE (days): Did not fail.

FAILURE MECHANISM: -

BREACH DIMENSIONS: -

CONTROLS: Outlet channel paved and protected.

DAM MATERIALS: Marl - limestone debris.

REFERENCES: Eisbacher and Clague, 1984, p. 148-149; E. Friz, personal commun., ISMES, Bergamo, Italy.

COMMENTS: Five hamlets flooded by rising Lake of Alleghe. In Feb. 1771, commission contemplated draining lake. Another rockslide in 1771 caused huge wave in lake, killed three people; but dam held.

07/15/91

COUNTRY: Italy

SUBDIVISION: Veneto Region, near Borca

DATE: 1814; 4/21

RIVER OR LAKE: Boite Torrent

TYPE OF LANDSLIDE: Avalanche, rock

TRIGGER: ?

LANDSLIDE VOLUME (m^3): 20,000,000

DAM TYPE: ?

DAM HEIGHT (m): 30

DAM LENGTH (m): 750

DAM WIDTH (m): 750

LAKE LENGTH (m): ?

LAKE VOLUME (m^3): ? (area = 0.13 sq km)

TIME TO FAILURE (days): ?

FAILURE MECHANISM: ?

BREACH DIMENSIONS: ?

CONTROLS: -

DAM MATERIALS: Broken dolomite.

REFERENCES: Eisbacher and Clague, 1984, p. 160-161; E. Friz, personal commun. ISMES, Bergamo, Italy.

COMMENTS: Dam apparently failed, but no information available.

07/15/91

COUNTRY: Jamaica

SUBDIVISION: St. Thomas Parish, near Mount Sinai

DATE: 1692; 10/18-19

RIVER OR LAKE: Yallahs River

TYPE OF LANDSLIDE: Slump, rock

TRIGGER: Rainfall

LANDSLIDE VOLUME (m^3): 66,000,000

DAM TYPE: II

DAM HEIGHT (m): ?

DAM LENGTH (m): ?

DAM WIDTH (m): ?

LAKE LENGTH (m): ?

LAKE VOLUME (m^3): ?

TIME TO FAILURE (days): ?

FAILURE MECHANISM: Overtopping

BREACH DIMENSIONS: ?

CONTROLS: -

DAM MATERIALS: Limestone debris, including 30-m blocks.

REFERENCES: Zans, 1959.

COMMENTS: -

07/15/91

COUNTRY: Japan

SUBDIVISION: Akita Prefecture, Yachi

DATE: 1984; 9/?

RIVER OR LAKE: Naruse River

TYPE OF LANDSLIDE: Slide, rock

TRIGGER: Rainfall

LANDSLIDE VOLUME (m^3): 35,000,000

DAM TYPE: II

DAM HEIGHT (m): ?

DAM LENGTH (m): ?

DAM WIDTH (m): 950

LAKE LENGTH (m): ?

LAKE VOLUME (m^3): ?

TIME TO FAILURE (days): ?

FAILURE MECHANISM: ?

BREACH DIMENSIONS: ?

CONTROLS: -

DAM MATERIALS: Shale debris.

REFERENCES: Japan Landslide Society, 1988.

COMMENTS: Ensuing flood caused heavy damage in community 10 km downstream.

07/15/91

COUNTRY: Japan

SUBDIVISION: Fukushima Prefecture, Iwashiro Province

DATE: 1888; 7/15

RIVER OR LAKE: Osusawa River; Osusawa Lake

TYPE OF LANDSLIDE: Avalanche, debris

TRIGGER: Volcanic eruption

LANDSLIDE VOLUME (m^3): 1,500,000,000

DAM TYPE: III

DAM HEIGHT (m): 18

DAM LENGTH (m): ?

DAM WIDTH (m): ?

LAKE LENGTH (m): 5,000

LAKE VOLUME (m^3): ?

TIME TO FAILURE (days): Did not fail.

FAILURE MECHANISM: -

BREACH DIMENSIONS: -

CONTROLS: This lake has combined with Hibara Lake to form Hibara Lake.

DAM MATERIALS: Volcanic debris.

REFERENCES: Sekiya and Kikuchi, 1889; Swanson and others, 1986; Ministry of Construction, 1987.

COMMENTS: Flood losses in downstream areas small. Lake filled slowly because basin large and drainage area small.

07/15/91

COUNTRY: Japan

SUBDIVISION: Fukushima Prefecture, Iwashiro Province, Yama District

DATE: 1888; 7/15

RIVER OR LAKE: Ono River; Onogawa Lake

TYPE OF LANDSLIDE: Avalanche, debris

TRIGGER: Volcanic eruption

LANDSLIDE VOLUME (m^3): 1,500,000,000

DAM TYPE: III

DAM HEIGHT (m): 18

DAM LENGTH (m): 500

DAM WIDTH (m): ?

LAKE LENGTH (m): 4,000

LAKE VOLUME (m^3): 14,000,000

TIME TO FAILURE (days): 272

FAILURE MECHANISM: ?

BREACH DIMENSIONS: ?

CONTROLS: Small dam controls level of lake today.

DAM MATERIALS: Volcanic debris.

REFERENCES: Sekiya and Kikuchi, 1889; Swanson and others, 1986; Ministry of Construction, 1987.

COMMENTS: Damage in downstream areas small. Lake filled slowly because basin large and drainage area small.

07/15/91

COUNTRY: Japan

SUBDIVISION: Fukushima Prefecture, Iwashiro Province, Yama District

DATE: 1888; 7/15

RIVER OR LAKE: Hibara River; Hibara Lake.

TYPE OF LANDSLIDE: Avalanche, debris

TRIGGER: Volcanic eruption

LANDSLIDE VOLUME (m^3): 1,500,000,000

DAM TYPE: III

DAM HEIGHT (m): 25

DAM LENGTH (m): 800

DAM WIDTH (m): ?

LAKE LENGTH (m): 9,000

LAKE VOLUME (m^3): 150,000,000

TIME TO FAILURE (days): ?

FAILURE MECHANISM: ?

BREACH DIMENSIONS: ?

CONTROLS: 400 m long drainage tunnel placed through dam.

DAM MATERIALS: Volcanic debris.

REFERENCES: Sekiya and Kikuchi, 1889; Swanson and others, 1986; Ministry of Construction, 1987.

COMMENTS: Damage in downstream areas small. Lake filled slowly because basin large and drainage area small.

07/15/91

COUNTRY: Japan

SUBDIVISION: Fukushima Prefecture, Iwashiro Province, Yama District

DATE: 1888; 7/15

RIVER OR LAKE: Nakatsu River; Akimoto Lake

TYPE OF LANDSLIDE: Avalanche, debris

TRIGGER: Volcanic eruption

LANDSLIDE VOLUME (m^3): 1,500,000,000

DAM TYPE: III

DAM HEIGHT (m): 34

DAM LENGTH (m): 550

DAM WIDTH (m): ?

LAKE LENGTH (m): 4,000

LAKE VOLUME (m^3): 44,000,000

TIME TO FAILURE (days): 84

FAILURE MECHANISM: ?

BREACH DIMENSIONS: ?

CONTROLS: Small dam controls level of lake today.

DAM MATERIALS: Volcanic debris.

REFERENCES: Sekiya and Kikuchi, 1889; Swanson and others, 1986; Ministry of Construction, 1987.

COMMENTS: Damage in downstream areas small. Lakes filled slowly because basins were large and drainage areas small.

07/15/91

COUNTRY: Japan

SUBDIVISION: Gifu Prefecture, Sakauchi Village

DATE: 1895; 8/5

RIVER OR LAKE: Sakauchi River

TYPE OF LANDSLIDE: Fall, rock

TRIGGER: Rainfall

LANDSLIDE VOLUME (m^3): 1,500,000

DAM TYPE: II

DAM HEIGHT (m): 38

DAM LENGTH (m): 110

DAM WIDTH (m): 350

LAKE LENGTH (m): 2,000

LAKE VOLUME (m^3): 2,000,000

TIME TO FAILURE (days): 6

FAILURE MECHANISM: Overtopping

BREACH DIMENSIONS: ?

CONTROLS: -

DAM MATERIALS: Shale, sandstone.

REFERENCES: Ministry of Construction (Japan), 1987.

COMMENTS: -

07/15/91

COUNTRY: Japan

SUBDIVISION: Gifu Prefecture, Shirakawa Village

DATE: 1586; 11/29

RIVER OR LAKE: Sho River

TYPE OF LANDSLIDE: Slide, rock /avalanche

TRIGGER: Earthquake

LANDSLIDE VOLUME (m^3): 25,000,000

DAM TYPE: II

DAM HEIGHT (m): 90

DAM LENGTH (m): 900

DAM WIDTH (m): 500

LAKE LENGTH (m): 12,000

LAKE VOLUME (m^3): 150,000,000

TIME TO FAILURE (days): 20

FAILURE MECHANISM: Overtopping

BREACH DIMENSIONS: ?

CONTROLS: -

DAM MATERIALS: Rhyolite.

REFERENCES: Ministry of Construction (Japan), 1987.

COMMENTS: 300 houses destroyed by flooding due to failure of dam.

07/15/91

COUNTRY: Japan

SUBDIVISION: Gifu Prefecture, Shirakawa Village

DATE: 1586; 11/29

RIVER OR LAKE: Oshiro River

TYPE OF LANDSLIDE: Flow, debris

TRIGGER: Earthquake

LANDSLIDE VOLUME (m^3): 2,400,000

DAM TYPE: II

DAM HEIGHT (m): 60

DAM LENGTH (m): 250

DAM WIDTH (m): 250

LAKE LENGTH (m): ?

LAKE VOLUME (m^3): 6,000,000

TIME TO FAILURE (days): ?

FAILURE MECHANISM: ?

BREACH DIMENSIONS: ?

CONTROLS: ?

DAM MATERIALS: Rhyolite.

REFERENCES: Ministry of Construction (Japan), 1987.

COMMENTS: Don't know whether or not dam failed.

07/15/91

COUNTRY: Japan

SUBDIVISION: Gifu Prefecture, Shirakawa Village

DATE: 1586; 11/29

RIVER OR LAKE: Oshiro River

TYPE OF LANDSLIDE: Flow, debris

TRIGGER: Earthquake

LANDSLIDE VOLUME (m^3): 3,000,000

DAM TYPE: II

DAM HEIGHT (m): 60

DAM LENGTH (m): 300

DAM WIDTH (m): 300

LAKE LENGTH (m): ?

LAKE VOLUME (m^3): 6,400,000

TIME TO FAILURE (days): ?

FAILURE MECHANISM: ?

BREACH DIMENSIONS: ?

CONTROLS: ?

DAM MATERIALS: Rhyolite.

REFERENCES: Ministry of Construction (Japan), 1987.

COMMENTS: Don't know whether or not dam failed.

07/15/91

COUNTRY: Japan

SUBDIVISION: Gifu Prefecture, Tokuyama Village

DATE: 1965; 9/?

RIVER OR LAKE: Shiratani River, trib. of Ibi River

TYPE OF LANDSLIDE: Glide, block

TRIGGER: Rainfall

LANDSLIDE VOLUME (m^3): 1,800,000

DAM TYPE: II

DAM HEIGHT (m): 25

DAM LENGTH (m): 200

DAM WIDTH (m): 250

LAKE LENGTH (m): 650

LAKE VOLUME (m^3): 1,300,000

TIME TO FAILURE (days): Did not fail.

FAILURE MECHANISM: -

BREACH DIMENSIONS: -

CONTROLS: Artificial excavation.

DAM MATERIALS: ?

REFERENCES: Ministry of Construction (Japan), 1987).

COMMENTS: -

07/15/91

COUNTRY: Japan

SUBDIVISION: Gumma Prefecture, Asama Volcano

DATE: 1783; 8/5

RIVER OR LAKE: Agatsuma River

TYPE OF LANDSLIDE: Avalanche, debris

TRIGGER: Volcanic eruption

LANDSLIDE VOLUME (m^3): ?

DAM TYPE: ?

DAM HEIGHT (m): 60

DAM LENGTH (m): ?

DAM WIDTH (m): ?

LAKE LENGTH (m): ?

LAKE VOLUME (m^3): ?

TIME TO FAILURE (days): ?

FAILURE MECHANISM: ?

BREACH DIMENSIONS: ?

CONTROLS: -

DAM MATERIALS: ?

REFERENCES: Aramaki, 1956; Aramaki, 1981.

COMMENTS: Flood from failure of dam traveled 90 km; much damage and death.

07/15/91

COUNTRY: Japan

SUBDIVISION: Hokkaido Prefecture, Bibai City

DATE: 1969

RIVER OR LAKE: Ishikari River tributary

TYPE OF LANDSLIDE: Slide, earth

TRIGGER: Snowmelt

LANDSLIDE VOLUME (m^3): 2,000,000

DAM TYPE: II

DAM HEIGHT (m): 15

DAM LENGTH (m): ?

DAM WIDTH (m): 500

LAKE LENGTH (m): ?

LAKE VOLUME (m^3): ?

TIME TO FAILURE (days): ?

FAILURE MECHANISM: ?

BREACH DIMENSIONS: ?

CONTROLS: ?

DAM MATERIALS: Tertiary mudstones, sandstones, and colluvium.

REFERENCES: Sato, 1985.

COMMENTS: Slide assumed to have occurred at contact of mudstone and colluvium.

07/15/91

COUNTRY: Japan

SUBDIVISION: Hokkaido Prefecture, Kamikawa

DATE: 1980; 10/16

RIVER OR LAKE: Chubetsu River

TYPE OF LANDSLIDE: Avalanche, debris

TRIGGER: Rainfall

LANDSLIDE VOLUME (m^3): 20,000

DAM TYPE: II

DAM HEIGHT (m): 3

DAM LENGTH (m): ?

DAM WIDTH (m): ?

LAKE LENGTH (m): ?

LAKE VOLUME (m^3): ?

TIME TO FAILURE (days): ?

FAILURE MECHANISM: ?

BREACH DIMENSIONS: ?

CONTROLS: ?

DAM MATERIALS: ?

REFERENCES: Yamagishi, 1985.

COMMENTS: Dammed the Chubetsu River for a short time.

07/15/91

COUNTRY: Japan

SUBDIVISION: Kanagawa Prefecture, Hakone

DATE: 1910

RIVER OR LAKE: Haya River

TYPE OF LANDSLIDE: Flow, debris

TRIGGER: Rainfall

LANDSLIDE VOLUME (m^3): ?

DAM TYPE: ?

DAM HEIGHT (m): ?

DAM LENGTH (m): ?

DAM WIDTH (m): ?

LAKE LENGTH (m): ?

LAKE VOLUME (m^3): ?

TIME TO FAILURE (days): ?

FAILURE MECHANISM: ?

BREACH DIMENSIONS: ?

CONTROLS: ?

DAM MATERIALS: Hydrothermally altered andesitic lava flows and tuff breccias.

REFERENCES: Japan Landslide Society, 1980.

COMMENTS: -

07/15/91

COUNTRY: Japan

SUBDIVISION: Kanagawa Prefecture, Hatano City

DATE: 1923; 9/1

RIVER OR LAKE: Shinsei Lake

TYPE OF LANDSLIDE: Slump, earth

TRIGGER: Earthquake

LANDSLIDE VOLUME (m^3): 230,000

DAM TYPE: II

DAM HEIGHT (m): 10

DAM LENGTH (m): 100

DAM WIDTH (m): 200

LAKE LENGTH (m): 200

LAKE VOLUME (m^3): 37,000

TIME TO FAILURE (days): Did not fail.

FAILURE MECHANISM: -

BREACH DIMENSIONS: -

CONTROLS: ?

DAM MATERIALS: Sand, gravel, loam.

REFERENCES: Ministry of Construction (Japan), 1987.

COMMENTS: -

07/15/91

COUNTRY: Japan

SUBDIVISION: Kochi Prefecture, Morobe Village

DATE: 1788; 7/26

RIVER OR LAKE: Kaminirau River

TYPE OF LANDSLIDE: ?

TRIGGER: ?

LANDSLIDE VOLUME (m^3): 2,000,000

DAM TYPE: II

DAM HEIGHT (m): 36

DAM LENGTH (m): 250

DAM WIDTH (m): 400

LAKE LENGTH (m): 1,500

LAKE VOLUME (m^3): 2,200,000

TIME TO FAILURE (days): ? (several years)

FAILURE MECHANISM: ?

BREACH DIMENSIONS: ?

CONTROLS: -

DAM MATERIALS: ?

REFERENCES: Ministry of Construction (Japan), 1987.

COMMENTS: 10 houses collapsed and many people died due to landslide itself. No data on effects of downstream flooding.

07/15/91

COUNTRY: Japan

SUBDIVISION: Nagano Prefecture, Azumi Village

DATE: 1915; 6/6

RIVER OR LAKE: Azusa River

TYPE OF LANDSLIDE: Flow, debris

TRIGGER: Volcanic eruption

LANDSLIDE VOLUME (m^3): 1,700,000

DAM TYPE: ?

DAM HEIGHT (m): 4.5

DAM LENGTH (m): ?

DAM WIDTH (m): ?

LAKE LENGTH (m): 2,000

LAKE VOLUME (m^3): 530,000

TIME TO FAILURE (days): Did not fail.

FAILURE MECHANISM: -

BREACH DIMENSIONS: -

CONTROLS: ?

DAM MATERIALS: Andesite.

REFERENCES: Ministry of Construction (Japan), 1987.

COMMENTS: -

07/15/91

COUNTRY: Japan

SUBDIVISION: Nagano Prefecture, Azumi Village

DATE: 1926; 7/23

RIVER OR LAKE: Azusa River

TYPE OF LANDSLIDE: Flow, debris

TRIGGER: Volcanic eruption

LANDSLIDE VOLUME (m^3): ?

DAM TYPE: ?

DAM HEIGHT (m): 10

DAM LENGTH (m): ?

DAM WIDTH (m): 330

LAKE LENGTH (m): 2,300

LAKE VOLUME (m^3): 1,200,000

TIME TO FAILURE (days): Did not fail.

FAILURE MECHANISM: -

BREACH DIMENSIONS: -

CONTROLS: ?

DAM MATERIALS: Andesite.

REFERENCES: Ministry of Construction (Japan), 1987.

COMMENTS: -

07/15/91

COUNTRY: Japan

SUBDIVISION: Nagano Prefecture, Hakuba Village

DATE: 1891; 6/?

RIVER OR LAKE: Matsu River

TYPE OF LANDSLIDE: Slide, rock /avalanche, earth

TRIGGER: Rainfall

LANDSLIDE VOLUME (m^3): 3,200,000

DAM TYPE: II

DAM HEIGHT (m): 55

DAM LENGTH (m): 500

DAM WIDTH (m): 230

LAKE LENGTH (m): 500

LAKE VOLUME (m^3): 3,100,000

TIME TO FAILURE (days): Did not fail.

FAILURE MECHANISM: -

BREACH DIMENSIONS: -

CONTROLS: ?

DAM MATERIALS: Sedimentary rocks.

REFERENCES: Ministry of Construction (Japan), 1987.

COMMENTS: -

07/15/91

COUNTRY: Japan

SUBDIVISION: Nagano Prefecture, Kinasa Village

DATE: 1847; 3/24

RIVER OR LAKE: Susobana River

TYPE OF LANDSLIDE: Slide, rock and earth

TRIGGER: Earthquake

LANDSLIDE VOLUME (m^3): 1,200,000

DAM TYPE: II

DAM HEIGHT (m): 48

DAM LENGTH (m): 250

DAM WIDTH (m): 300

LAKE LENGTH (m): 2,100

LAKE VOLUME (m^3): 16,000,000

TIME TO FAILURE (days): 110

FAILURE MECHANISM: ?

BREACH DIMENSIONS: ?

CONTROLS: ?

DAM MATERIALS: ?

REFERENCES: Ministry of Construction (Japan), 1987.

COMMENTS: -

07/15/91

COUNTRY: Japan

SUBDIVISION: Nagano Prefecture, Mount Hieda

DATE: 1911; 8/9

RIVER OR LAKE: Hime River

TYPE OF LANDSLIDE: Flow, debris

TRIGGER: Rainfall

LANDSLIDE VOLUME (m^3): 20,000,000

DAM TYPE: ?

DAM HEIGHT (m): 60

DAM LENGTH (m): 500

DAM WIDTH (m): ?

LAKE LENGTH (m): 4,000

LAKE VOLUME (m^3): 16,000,000

TIME TO FAILURE (days): 4 and 350 (failed twice)

FAILURE MECHANISM: ?

BREACH DIMENSIONS: ?

CONTROLS: -

DAM MATERIALS: Andesite tuff breccia.

REFERENCES: Ministry of Construction (Japan), 1987.

COMMENTS: 23 people died from landslide. 50 houses inundated by upstream flooding. Dam failed twice: Aug 13, 1911; and Jul 21-22, 1912.

07/15/91

COUNTRY: Japan

SUBDIVISION: Nagano Prefecture, Mount Ontake

DATE: 1984; 9/14

RIVER OR LAKE: Otaki River

TYPE OF LANDSLIDE: Avalanche, debris

TRIGGER: Earthquake and rainfall

LANDSLIDE VOLUME (m^3): 36,000,000

DAM TYPE: III

DAM HEIGHT (m): 40

DAM LENGTH (m): 250

DAM WIDTH (m): 2,500

LAKE LENGTH (m): 1,000

LAKE VOLUME (m^3): ?

TIME TO FAILURE (days): Did not fail.

FAILURE MECHANISM: -

BREACH DIMENSIONS: -

CONTROLS: Spillway dug by authorities.

DAM MATERIALS: Volcanic debris.

REFERENCES: Moriwaki and others, 1985.

COMMENTS: -

07/15/91

COUNTRY: Japan

SUBDIVISION: Nagano Prefecture, Nagano City

DATE: 1847; 3/24

RIVER OR LAKE: Sai River

TYPE OF LANDSLIDE: Slide, rock and earth

TRIGGER: Earthquake

LANDSLIDE VOLUME (m^3): 2,000,000

DAM TYPE: II

DAM HEIGHT (m): 65 - 100

DAM LENGTH (m): ?

DAM WIDTH (m): 650

LAKE LENGTH (m): 23,000

LAKE VOLUME (m^3): 350,000,000

TIME TO FAILURE (days): 19

FAILURE MECHANISM: Overtopping

BREACH DIMENSIONS: ?

CONTROLS: -

DAM MATERIALS: Mudstone.

REFERENCES: Swanson and others, 1986; Ministry of Construction (Japan), 1987.

COMMENTS: 13 villages flooded upstream, downstream flood max depth = 20 m, thousands of houses flooded, 81 villages, more than 100 killed. Two sources differ on volume of landslide.

07/15/91

COUNTRY: Japan

SUBDIVISION: Nagano Prefecture, Ojika Village

DATE: 1961; 6/29

RIVER OR LAKE: Koshibu River

TYPE OF LANDSLIDE: Slide, rock and earth /avalanche, debri

TRIGGER: Rainfall

LANDSLIDE VOLUME (m^3): 3,000,000

DAM TYPE: II

DAM HEIGHT (m): 6

DAM LENGTH (m): 500

DAM WIDTH (m): 800

LAKE LENGTH (m): ?

LAKE VOLUME (m^3): 400,000

TIME TO FAILURE (days): <10 (within a few days)

FAILURE MECHANISM: Overtopping

BREACH DIMENSIONS: ?

CONTROLS: ?

DAM MATERIALS: ?

REFERENCES: Swanson and others, 1986; Ministry of Construction (Japan), 1987.

COMMENTS: River cut new channel within a few days, but houses and fields upstream were flooded.

07/15/91

COUNTRY: Japan

SUBDIVISION: Nagano Prefecture, Otari Vilage

DATE: 1971; 7/16

RIVER OR LAKE: Hime River

TYPE OF LANDSLIDE: Slide, earth

TRIGGER: Rainfall

LANDSLIDE VOLUME (m^3): 300,000

DAM TYPE: I

DAM HEIGHT (m): ?

DAM LENGTH (m): 80

DAM WIDTH (m): 80

LAKE LENGTH (m): ?

LAKE VOLUME (m^3): ? (area = 0.025 sq km)

TIME TO FAILURE (days): Did not fail.

FAILURE MECHANISM: -

BREACH DIMENSIONS: -

CONTROLS: Artificial excavation.

DAM MATERIALS: Hydrothermally altered tuff, mudstone, sandstone.

REFERENCES: Japan Landslide Society, 1980; Ministry of Construction (Japan) 1987.

COMMENTS: Overflow destroyed highway, 15 houses, and some public buildings.

07/15/91

COUNTRY: Japan

SUBDIVISION: Nagano Prefecture, Shinshushin Town

DATE: 1847; 3/24

RIVER OR LAKE: Yanagikubo River

TYPE OF LANDSLIDE: Slide, rock and earth

TRIGGER: Earthquake

LANDSLIDE VOLUME (m^3): 1,500,000

DAM TYPE: II

DAM HEIGHT (m): 35

DAM LENGTH (m): 150

DAM WIDTH (m): 250

LAKE LENGTH (m): 500

LAKE VOLUME (m^3): 1,400,000

TIME TO FAILURE (days): ?

FAILURE MECHANISM: ?

BREACH DIMENSIONS: ?

CONTROLS: ?

DAM MATERIALS: ?

REFERENCES: Ministry of Construction (Japan), 1987.

COMMENTS: Do not know if dam failure occurred.

07/15/91

COUNTRY: Japan

SUBDIVISION: Nara Prefecture, Amakawa Village

DATE: 1889; 8/20

RIVER OR LAKE: Totsu River

TYPE OF LANDSLIDE: Slide, rock and earth

TRIGGER: Rainfall

LANDSLIDE VOLUME (m^3): 50,000,000

DAM TYPE: II

DAM HEIGHT (m): 80

DAM LENGTH (m): 100

DAM WIDTH (m): 500

LAKE LENGTH (m): 6,000

LAKE VOLUME (m^3): 17,000,000

TIME TO FAILURE (days): 0.3

FAILURE MECHANISM: ?

BREACH DIMENSIONS: ?

CONTROLS: -

DAM MATERIALS: Sedimentary rocks.

REFERENCES: Ministry of Construction (Japan), 1987.

COMMENTS: Upstream flooding of three houses; downstream flooding destroyed many houses and bridges.

07/15/91

COUNTRY: Japan

SUBDIVISION: Nara Prefecture, Daito Village

DATE: 1889; 8/20

RIVER OR LAKE: Totsu River

TYPE OF LANDSLIDE: Slide, rock and earth

TRIGGER: Rainfall

LANDSLIDE VOLUME (m^3): 1,600,000

DAM TYPE: II

DAM HEIGHT (m): 10

DAM LENGTH (m): 130

DAM WIDTH (m): 400

LAKE LENGTH (m): 2,800

LAKE VOLUME (m^3): 930,000

TIME TO FAILURE (days): 0.2

FAILURE MECHANISM: Overtopping

BREACH DIMENSIONS: ?

CONTROLS: -

DAM MATERIALS: Sedimentary rocks.

REFERENCES: Ministry of Construction (Japan), 1987.

COMMENTS: Another dam failed upstream causing failure of this dam.

07/15/91

COUNTRY: Japan

SUBDIVISION: Nara Prefecture, Daito Village

DATE: 1889; 8/20

RIVER OR LAKE: Totsu River

TYPE OF LANDSLIDE: Avalanche, debris

TRIGGER: Rainfall

LANDSLIDE VOLUME (m^3): 23,000,000

DAM TYPE: II

DAM HEIGHT (m): 18

DAM LENGTH (m): 100

DAM WIDTH (m): 450

LAKE LENGTH (m): 2,000

LAKE VOLUME (m^3): 780,000

TIME TO FAILURE (days): 0.04

FAILURE MECHANISM: ?

BREACH DIMENSIONS: ?

CONTROLS: -

DAM MATERIALS: Sedimentary rocks.

REFERENCES: Ministry of Construction (Japan), 1987.

COMMENTS: Landslide buried six houses and killed 20 people.

07/15/91

COUNTRY: Japan

SUBDIVISION: Nara Prefecture, Daito Village

DATE: 1889; 8/21

RIVER OR LAKE: Kawarabitsu River, trib. of Totsu River

TYPE OF LANDSLIDE: Slide, rock and earth

TRIGGER: Rainfall

LANDSLIDE VOLUME (m^3): 26,000,000

DAM TYPE: II

DAM HEIGHT (m): 80

DAM LENGTH (m): 300

DAM WIDTH (m): 700

LAKE LENGTH (m): 9,000

LAKE VOLUME (m^3): 40,000,000

TIME TO FAILURE (days): 17

FAILURE MECHANISM: Overtopping

BREACH DIMENSIONS: ?

CONTROLS: -

DAM MATERIALS: Sedimentary rocks.

REFERENCES: Ministry of Construction (Japan), 1987.

COMMENTS: -

07/15/91

COUNTRY: Japan

SUBDIVISION: Nara Prefecture, Daito Village

DATE: 1889; 9/7

RIVER OR LAKE: Totsu River

TYPE OF LANDSLIDE: ?

TRIGGER: Rainfall

LANDSLIDE VOLUME (m^3): ?

DAM TYPE: ?

DAM HEIGHT (m): 6

DAM LENGTH (m): ?

DAM WIDTH (m): ?

LAKE LENGTH (m): 1,700

LAKE VOLUME (m^3): 260,000

TIME TO FAILURE (days): 4

FAILURE MECHANISM: ?

BREACH DIMENSIONS: ?

CONTROLS: -

DAM MATERIALS: Sedimentary rocks.

REFERENCES: Ministry of Construction (Japan), 1987.

COMMENTS:

07/15/91

COUNTRY: Japan

SUBDIVISION: Nara Prefecture, Hanazono Village

DATE: 1889; 8/19

RIVER OR LAKE: Totsu River

TYPE OF LANDSLIDE: Slide, rock and earth

TRIGGER: Rainfall

LANDSLIDE VOLUME (m^3): 1,700,000

DAM TYPE: II

DAM HEIGHT (m): 10

DAM LENGTH (m): 160

DAM WIDTH (m): 220

LAKE LENGTH (m): 1,600

LAKE VOLUME (m^3): 520,000

TIME TO FAILURE (days): ?

FAILURE MECHANISM: ?

BREACH DIMENSIONS: ?

CONTROLS: -

DAM MATERIALS: Sedimentary rocks.

REFERENCES: Ministry of Construction (Japan), 1987.

COMMENTS: Landslide buried two houses and killed three people. Upstream flooding of 19 houses.

07/15/91

COUNTRY: Japan

SUBDIVISION: Nara Prefecture, Hanazono Village

DATE: 1889; 8/19

RIVER OR LAKE: Totsu River

TYPE OF LANDSLIDE: Slide /avalanche, rock

TRIGGER: Rainfall

LANDSLIDE VOLUME (m^3): 20,000,000

DAM TYPE: II

DAM HEIGHT (m): 28

DAM LENGTH (m): 250

DAM WIDTH (m): 500

LAKE LENGTH (m): 3,000

LAKE VOLUME (m^3): 3,200,000

TIME TO FAILURE (days): ?

FAILURE MECHANISM: ?

BREACH DIMENSIONS: ?

CONTROLS: -

DAM MATERIALS: Sedimentary rocks.

REFERENCES: Ministry of Construction (Japan), 1987.

COMMENTS: Six houses inundated by upstream flooding.

07/15/91

COUNTRY: Japan

SUBDIVISION: Nara Prefecture, Hanazono Village

DATE: 1889; 8/19

RIVER OR LAKE: Totsu River

TYPE OF LANDSLIDE: Slide, rock and earth

TRIGGER: Rainfall

LANDSLIDE VOLUME (m^3): 36,000,000

DAM TYPE: II

DAM HEIGHT (m): 10

DAM LENGTH (m): 150

DAM WIDTH (m): 150

LAKE LENGTH (m): 1,000

LAKE VOLUME (m^3): 560,000

TIME TO FAILURE (days): 0.1

FAILURE MECHANISM: ?

BREACH DIMENSIONS: ?

CONTROLS: -

DAM MATERIALS: Sedimentary rocks.

REFERENCES: Ministry of Construction (Japan), 1987.

COMMENTS: Landslide buried one house and killed one person. Upstream flooding of 47 houses and seven public buildings.

07/15/91

COUNTRY: Japan

SUBDIVISION: Nara Prefecture, Hanazono Village

DATE: 1889; 8/20

RIVER OR LAKE: Totsu River

TYPE OF LANDSLIDE: Slide, rock and earth

TRIGGER: Rainfall

LANDSLIDE VOLUME (m^3): 2,500,000

DAM TYPE: II

DAM HEIGHT (m): 50

DAM LENGTH (m): 180

DAM WIDTH (m): 300

LAKE LENGTH (m): 2,000

LAKE VOLUME (m^3): 1,600,000

TIME TO FAILURE (days): 0.7

FAILURE MECHANISM: Overtopping

BREACH DIMENSIONS: ?

CONTROLS: -

DAM MATERIALS: Sedimentary rocks.

REFERENCES: Ministry of Construction (Japan), 1987.

COMMENTS: Landslide buried two houses and collapsed four houses. Two houses inundated by upstream flooding.

07/15/91

COUNTRY: Japan

SUBDIVISION: Nara Prefecture, Kitatotsugawa Village

DATE: 1889; 8/19

RIVER OR LAKE: Asahi River

TYPE OF LANDSLIDE: Slide, rock and earth

TRIGGER: Rainfall

LANDSLIDE VOLUME (m^3): 8,800,000

DAM TYPE: II

DAM HEIGHT (m): 25

DAM LENGTH (m): 160

DAM WIDTH (m): 300

LAKE LENGTH (m): 2,700

LAKE VOLUME (m^3): 920,000

TIME TO FAILURE (days): 0.2

FAILURE MECHANISM: ?

BREACH DIMENSIONS: ?

CONTROLS: -

DAM MATERIALS: Sedimentary rocks.

REFERENCES: Ministry of Construction (Japan), 1987.

COMMENTS: Landslide buried four houses. Three houses inundated by upstream flooding.

07/15/91

COUNTRY: Japan

SUBDIVISION: Nara Prefecture, Kitatotsugawa Village

DATE: 1889; 8/19

RIVER OR LAKE: Kano River, trib. of Totsu River

TYPE OF LANDSLIDE: Slide, rock and earth

TRIGGER: Rainfall

LANDSLIDE VOLUME (m^3): 1,500,000

DAM TYPE: II

DAM HEIGHT (m): 25

DAM LENGTH (m): 180

DAM WIDTH (m): 200

LAKE LENGTH (m): 2,000

LAKE VOLUME (m^3): 1,800,000

TIME TO FAILURE (days): ?

FAILURE MECHANISM: ?

BREACH DIMENSIONS: ?

CONTROLS: -

DAM MATERIALS: Sedimentary rocks.

REFERENCES: Ministry of Construction (Japan), 1987.

COMMENTS: Five houses inundated by upstream flooding.

07/15/91

COUNTRY: Japan

SUBDIVISION: Nara Prefecture, Kitatotsugawa Village

DATE: 1889; 8/20

RIVER OR LAKE: Totsu River

TYPE OF LANDSLIDE: Slide, rock and earth

TRIGGER: Rainfall

LANDSLIDE VOLUME (m^3): 3,700,000

DAM TYPE: II

DAM HEIGHT (m): 110

DAM LENGTH (m): 200

DAM WIDTH (m): ?

LAKE LENGTH (m): 5,000

LAKE VOLUME (m^3): 42,000,000

TIME TO FAILURE (days): 0.7

FAILURE MECHANISM: ?

BREACH DIMENSIONS: ?

CONTROLS: -

DAM MATERIALS: Sedimentary rocks.

REFERENCES: Ministry of Construction (Japan), 1987.

COMMENTS: Landslide killed 49 people. 105 houses inundated by upstream flooding. Failure of this dam washed out another landslide dam downstream.

07/15/91

COUNTRY: Japan

SUBDIVISION: Nara Prefecture, Kitatotsugawa Village

DATE: 1889; 8/20

RIVER OR LAKE: Totsu River

TYPE OF LANDSLIDE: Slide /avalanche, debris

TRIGGER: Rainfall

LANDSLIDE VOLUME (m^3): 5,600,000

DAM TYPE: II

DAM HEIGHT (m): 12

DAM LENGTH (m): 200

DAM WIDTH (m): 250

LAKE LENGTH (m): 2,300

LAKE VOLUME (m^3): 720,000

TIME TO FAILURE (days): ?

FAILURE MECHANISM: ?

BREACH DIMENSIONS: ?

CONTROLS: -

DAM MATERIALS: Sedimentary rocks.

REFERENCES: Ministry of Construction (Japan), 1987.

COMMENTS: Landslide killed six people. 12 houses, elementary school, post office, and training center inundated by upstream flooding.

07/15/91

COUNTRY: Japan

SUBDIVISION: Nara Prefecture, Kitatotsugawa Village

DATE: 1889; 8/20

RIVER OR LAKE: Kano River, trib. of Totsu River

TYPE OF LANDSLIDE: ?

TRIGGER: Rainfall

LANDSLIDE VOLUME (m^3): 3,600,000

DAM TYPE: II

DAM HEIGHT (m): 15

DAM LENGTH (m): 130

DAM WIDTH (m): 130

LAKE LENGTH (m): 2,500

LAKE VOLUME (m^3): 1,300,000

TIME TO FAILURE (days): 0.02

FAILURE MECHANISM: ?

BREACH DIMENSIONS: ?

CONTROLS: -

DAM MATERIALS: Sedimentary rocks.

REFERENCES: Ministry of Construction (Japan), 1987.

COMMENTS: Landslide killed eight and collapsed four houses.
Three houses inundated by upstream flooding.

07/15/91

COUNTRY: Japan

SUBDIVISION: Nara Prefecture, Nakatotsugawa Village

DATE: 1889; 8/20

RIVER OR LAKE: Totsu River

TYPE OF LANDSLIDE: Slide /avalanche, rock and earth

TRIGGER: Rainfall

LANDSLIDE VOLUME (m^3): 110,000

DAM TYPE: II

DAM HEIGHT (m): 7

DAM LENGTH (m): 100

DAM WIDTH (m): ?

LAKE LENGTH (m): 3,000

LAKE VOLUME (m^3): 650,000

TIME TO FAILURE (days): 0.08

FAILURE MECHANISM: ?

BREACH DIMENSIONS: ?

CONTROLS: -

DAM MATERIALS: Sedimentary rocks.

REFERENCES: Ministry of Construction (Japan), 1987.

COMMENTS: Landslide killed seven and collapsed seven houses.
Eight houses inundated by upstream flooding.

07/15/91

COUNTRY: Japan

SUBDIVISION: Nara Prefecture, Nishitotsugawa Village

DATE: 1889; 8/20

RIVER OR LAKE: Nishi River, trib. of Totsu River

TYPE OF LANDSLIDE: Slide, rock and earth

TRIGGER: Rainfall

LANDSLIDE VOLUME (m^3): 4,400,000

DAM TYPE: II

DAM HEIGHT (m): 25

DAM LENGTH (m): 130

DAM WIDTH (m): 250

LAKE LENGTH (m): 250

LAKE VOLUME (m^3): 110,000

TIME TO FAILURE (days): Did not fail.

FAILURE MECHANISM: -

BREACH DIMENSIONS: -

CONTROLS: -

DAM MATERIALS: Sedimentary rocks.

REFERENCES: Ministry of Construction (Japan), 1987.

COMMENTS: This is the only one of the 1889 landslide-dammed lakes that still exists.

07/15/91

COUNTRY: Japan

SUBDIVISION: Nara Prefecture, Nishiyoshino Village

DATE: 1982; 8/4

RIVER OR LAKE: Niu River

TYPE OF LANDSLIDE: Slump, rock/slide, debris

TRIGGER: Rainfall

LANDSLIDE VOLUME (m^3): 610,000

DAM TYPE: II

DAM HEIGHT (m): 15

DAM LENGTH (m): 50

DAM WIDTH (m): 180

LAKE LENGTH (m): 3,000

LAKE VOLUME (m^3): 1,300,000

TIME TO FAILURE (days): Did not fail.

FAILURE MECHANISM: -

BREACH DIMENSIONS: -

CONTROLS: Artificial channel opened in a few days.

DAM MATERIALS: Slate.

REFERENCES: Okunishi, 1985; Swanson and others, 1986; Ministry of Construction (Japan), 1987.

COMMENTS: 45 houses and many roads flooded by upstream flooding.

07/15/91

COUNTRY: Japan

SUBDIVISION: Nara Prefecture, Nosako Village

DATE: 1889; 8/19

RIVER OR LAKE: Iketsu River, trib. of Totsu River

TYPE OF LANDSLIDE: ?

TRIGGER: Rainfall

LANDSLIDE VOLUME (m^3): 5,400,000

DAM TYPE: II

DAM HEIGHT (m): 140

DAM LENGTH (m): 400

DAM WIDTH (m): 180

LAKE LENGTH (m): 4,000

LAKE VOLUME (m^3): 26,000,000

TIME TO FAILURE (days): 6

FAILURE MECHANISM: ?

BREACH DIMENSIONS: ?

CONTROLS: -

DAM MATERIALS: Sedimentary rocks.

REFERENCES: Ministry of Construction (Japan), 1987.

COMMENTS: -

07/15/91

COUNTRY: Japan

SUBDIVISION: Nara Prefecture, Oji Town

DATE: 1931 - 1932; 11/? - 7/?

RIVER OR LAKE: Yamato River

TYPE OF LANDSLIDE: Slide, rock and debris

TRIGGER: Rainfall

LANDSLIDE VOLUME (m^3): 22,000,000

DAM TYPE: VI

DAM HEIGHT (m): 20 - 36

DAM LENGTH (m): 50

DAM WIDTH (m): 170

LAKE LENGTH (m): ?

LAKE VOLUME (m^3): 10,000,000 (area = 2 sq km)

TIME TO FAILURE (days): Did not fail.

FAILURE MECHANISM: -

BREACH DIMENSIONS: -

CONTROLS: New channel 800 m long dug on south side of river.

DAM MATERIALS: Sandstone, tuff, clay.

REFERENCES: Ministry of Construction (Japan), 1980, 1987; Swanson and others, 1986.

COMMENTS: Best example of flooding due to uplift of streambed.

07/15/91

COUNTRY: Japan

SUBDIVISION: Nara Prefecture, Totsugawa Village

DATE: 1889; 8/20

RIVER OR LAKE: Imanishi River, trib. of Totsu River

TYPE OF LANDSLIDE: Slide, rock and earth

TRIGGER: Rainfall

LANDSLIDE VOLUME (m^3): 1,500,000

DAM TYPE: II

DAM HEIGHT (m): 60

DAM LENGTH (m): 250

DAM WIDTH (m): 250

LAKE LENGTH (m): 2,500

LAKE VOLUME (m^3): 6,400,000

TIME TO FAILURE (days): 1

FAILURE MECHANISM: ?

BREACH DIMENSIONS: ?

CONTROLS: -

DAM MATERIALS: Sedimentary rocks.

REFERENCES: Ministry of Construction (Japan), 1987.

COMMENTS: -

07/15/91

COUNTRY: Japan

SUBDIVISION: Nara Prefecture, Totsugawa Village

DATE: 1889; 8/20

RIVER OR LAKE: Kano River, trib. of Totsu River

TYPE OF LANDSLIDE: Flow, debris

TRIGGER: Rainfall

LANDSLIDE VOLUME (m^3): 5,200,000

DAM TYPE: II

DAM HEIGHT (m): 20

DAM LENGTH (m): 200

DAM WIDTH (m): 150

LAKE LENGTH (m): 1,600

LAKE VOLUME (m^3): 600,000

TIME TO FAILURE (days): 1

FAILURE MECHANISM: ?

BREACH DIMENSIONS: ?

CONTROLS: -

DAM MATERIALS: Sedimentary rocks.

REFERENCES: Ministry of Construction (Japan), 1987.

COMMENTS: One house inundated by upstream flooding.

07/15/91

COUNTRY: Japan

SUBDIVISION: Nara Prefecture, Totsugawa Village

DATE: 1889; 8/20

RIVER OR LAKE: Nishi River, trib. of Totsu River

TYPE OF LANDSLIDE: ?

TRIGGER: Rainfall

LANDSLIDE VOLUME (m^3): 4,400,000

DAM TYPE: ?

DAM HEIGHT (m): 20

DAM LENGTH (m): 200

DAM WIDTH (m): 250

LAKE LENGTH (m): 2,500

LAKE VOLUME (m^3): 1,300,000

TIME TO FAILURE (days): 0.4

FAILURE MECHANISM: ?

BREACH DIMENSIONS: ?

CONTROLS: -

DAM MATERIALS: Sedimentary rocks.

REFERENCES: Ministry of Construction (Japan), 1987.

COMMENTS: -

07/15/91

COUNTRY: Japan

SUBDIVISION: Nara Prefecture, Totsugawa Village

DATE: 1889; 8/20

RIVER OR LAKE: Yamate River, trib. of Totsu River

TYPE OF LANDSLIDE: Slide, rock and earth

TRIGGER: Rainfall

LANDSLIDE VOLUME (m^3): 6,600,000

DAM TYPE: II

DAM HEIGHT (m): 80

DAM LENGTH (m): 300

DAM WIDTH (m): 350

LAKE LENGTH (m): ?

LAKE VOLUME (m^3): 12,000,000

TIME TO FAILURE (days): 22

FAILURE MECHANISM: Overtopping

BREACH DIMENSIONS: ?

CONTROLS: -

DAM MATERIALS: Sedimentary rocks.

REFERENCES: Ministry of Construction (Japan), 1987.

COMMENTS: Landslide collapsed two houses. Two houses inundated by upstream flooding. Three houses inundated by dam-failure flood.

07/15/91

COUNTRY: Japan

SUBDIVISION: Nara Prefecture, Totsugawa Village

DATE: 1889; 8/20

RIVER OR LAKE: Oi River, trib. of Totsu River

TYPE OF LANDSLIDE: Slide, rock and earth

TRIGGER: Rainfall

LANDSLIDE VOLUME (m^3): 3,400,000

DAM TYPE: II

DAM HEIGHT (m): 100

DAM LENGTH (m): 400

DAM WIDTH (m): 150

LAKE LENGTH (m): 300

LAKE VOLUME (m^3): 2,300,000

TIME TO FAILURE (days): 10

FAILURE MECHANISM: ?

BREACH DIMENSIONS: ?

CONTROLS: -

DAM MATERIALS: Sedimentary rocks.

REFERENCES: Ministry of Construction (Japan), 1987.

COMMENTS: -

07/15/91

COUNTRY: Japan

SUBDIVISION: Nara Prefecture, Totsugawa Village

DATE: 1889; 8/20

RIVER OR LAKE: Kano River, trib. of Totsu River

TYPE OF LANDSLIDE: ?

TRIGGER: Rainfall

LANDSLIDE VOLUME (m^3): 1,300,000

DAM TYPE: II

DAM HEIGHT (m): 20

DAM LENGTH (m): 100

DAM WIDTH (m): 100

LAKE LENGTH (m): 1,800

LAKE VOLUME (m^3): 1,000,000

TIME TO FAILURE (days): ?

FAILURE MECHANISM: ?

BREACH DIMENSIONS: ?

CONTROLS: -

DAM MATERIALS: Sedimentary rocks.

REFERENCES: Ministry of Construction (Japan), 1987.

COMMENTS: Two houses flooded by upstream inundation.

07/15/91

COUNTRY: Japan

SUBDIVISION: Nara Prefecture, Totsugawa Village

DATE: 1889; 8/20

RIVER OR LAKE: Nishi River, trib. of Totsu River

TYPE OF LANDSLIDE: Slide, rock or earth

TRIGGER: Rainfall

LANDSLIDE VOLUME (m^3): 2,700,000

DAM TYPE: II

DAM HEIGHT (m): 25

DAM LENGTH (m): 200

DAM WIDTH (m): 250

LAKE LENGTH (m): 3,500

LAKE VOLUME (m^3): 1,800,000

TIME TO FAILURE (days): 0.4

FAILURE MECHANISM: ?

BREACH DIMENSIONS: ?

CONTROLS: -

DAM MATERIALS: Sedimentary rocks.

REFERENCES: Ministry of Construction (Japan), 1987.

COMMENTS: -

07/15/91

COUNTRY: Japan

SUBDIVISION: Nara Prefecture, Totsugawa Village

DATE: 1889; 8/20

RIVER OR LAKE: Nishi River, trib. of Totsu River

TYPE OF LANDSLIDE: ?

TRIGGER: Rainfall

LANDSLIDE VOLUME (m^3): 300,000

DAM TYPE: II

DAM HEIGHT (m): 20

DAM LENGTH (m): 120

DAM WIDTH (m): 160

LAKE LENGTH (m): 1,000

LAKE VOLUME (m^3): 400,000

TIME TO FAILURE (days): 0.4

FAILURE MECHANISM: ?

BREACH DIMENSIONS: ?

CONTROLS: -

DAM MATERIALS: Sedimentary rocks.

REFERENCES: Ministry of Construction (Japan), 1987.

COMMENTS: -

07/15/91

COUNTRY: Japan

SUBDIVISION: Nara Prefecture, Totsugawa Village

DATE: 1889; 8/20

RIVER OR LAKE: Imanishi River, trib. of Totsu River

TYPE OF LANDSLIDE: Slide, rock and earth

TRIGGER: Rainfall

LANDSLIDE VOLUME (m^3): 1,400,000

DAM TYPE: II

DAM HEIGHT (m): 75

DAM LENGTH (m): 350

DAM WIDTH (m): 125

LAKE LENGTH (m): 1,500

LAKE VOLUME (m^3): 9,000,000

TIME TO FAILURE (days): 1.5

FAILURE MECHANISM: ?

BREACH DIMENSIONS: ?

CONTROLS: -

DAM MATERIALS: Sedimentary rocks.

REFERENCES: Ministry of Construction (Japan), 1987.

COMMENTS: -

07/15/91

COUNTRY: Japan

SUBDIVISION: Nara Prefecture, Totsugawa Village

DATE: 1889; 8/20

RIVER OR LAKE: Kashiwa River, trib. of Totsu River

TYPE OF LANDSLIDE: Slide, rock and earth

TRIGGER: Rainfall

LANDSLIDE VOLUME (m^3): 4,900,000

DAM TYPE: II

DAM HEIGHT (m): 70

DAM LENGTH (m): 200

DAM WIDTH (m): 450

LAKE LENGTH (m): 600

LAKE VOLUME (m^3): 1,700,000

TIME TO FAILURE (days): 22

FAILURE MECHANISM: ?

BREACH DIMENSIONS: ?

CONTROLS: -

DAM MATERIALS: Sedimentary rocks.

REFERENCES: Ministry of Construction (Japan), 1987.

COMMENTS: Two houses and one shrine inundated by flood from dam failure.

07/15/91

COUNTRY: Japan

SUBDIVISION: Nara Prefecture, Totsugawa Village

DATE: 1889; 8/21

RIVER OR LAKE: Shiratani River, trib. of Totsu River

TYPE OF LANDSLIDE: Slide, rock and earth

TRIGGER: Rainfall

LANDSLIDE VOLUME (m^3): 20,000,000

DAM TYPE: II

DAM HEIGHT (m): 190

DAM LENGTH (m): 600

DAM WIDTH (m): 500

LAKE LENGTH (m): ?

LAKE VOLUME (m^3): 38,000,000

TIME TO FAILURE (days): 5

FAILURE MECHANISM: ?

BREACH DIMENSIONS: ?

CONTROLS: -

DAM MATERIALS: Sedimentary rocks.

REFERENCES: Ministry of Construction (Japan), 1987.

COMMENTS: Eleven houses flooded and two collapsed from flood due to dam failure. Failed because of "hydraulic pressure".

07/15/91

COUNTRY: Japan

SUBDIVISION: Niigata Prefecture, Arai City

DATE: 1962

RIVER OR LAKE: Hiramaru River

TYPE OF LANDSLIDE: Flow, mud

TRIGGER: Snowmelt

LANDSLIDE VOLUME (m^3): ?

DAM TYPE: ?

DAM HEIGHT (m): ?

DAM LENGTH (m): ?

DAM WIDTH (m): ?

LAKE LENGTH (m): ?

LAKE VOLUME (m^3): ?

TIME TO FAILURE (days): ?

FAILURE MECHANISM: ?

BREACH DIMENSIONS: ?

CONTROLS: ?

DAM MATERIALS: Mudstone.

REFERENCES: Japan Landslide Society, 1980.

COMMENTS: -

07/15/91

COUNTRY: Japan

SUBDIVISION: Niigata Prefecture, Arai City

DATE: 1970; 4/19

RIVER OR LAKE: Hiramaru River

TYPE OF LANDSLIDE: Flow, debris

TRIGGER: Snowmelt

LANDSLIDE VOLUME (m^3): 270,000

DAM TYPE: ?

DAM HEIGHT (m): 7

DAM LENGTH (m): ?

DAM WIDTH (m): ?

LAKE LENGTH (m): 200

LAKE VOLUME (m^3): 2,800

TIME TO FAILURE (days): ?

FAILURE MECHANISM: ?

BREACH DIMENSIONS: ?

CONTROLS: ?

DAM MATERIALS: Mudstone.

REFERENCES: Ministry of Construction (Japan), 1987.

COMMENTS: -

07/15/91

COUNTRY: Japan

SUBDIVISION: Niigata Prefecture, Arai City

DATE: 1978; 4/21

RIVER OR LAKE: Nagasawa River

TYPE OF LANDSLIDE: Slide, rock and earth

TRIGGER: Snowmelt

LANDSLIDE VOLUME (m^3): 300,000

DAM TYPE: II

DAM HEIGHT (m): 10

DAM LENGTH (m): 50

DAM WIDTH (m): 80

LAKE LENGTH (m): 300

LAKE VOLUME (m^3): 30,000

TIME TO FAILURE (days): ?

FAILURE MECHANISM: ?

BREACH DIMENSIONS: ?

CONTROLS: ?

DAM MATERIALS: Mudstone and tuff.

REFERENCES: Ministry of Construction (Japan), 1987.

COMMENTS: Road was flooded and closed for 2 months.

07/15/91

COUNTRY: Japan

SUBDIVISION: Niigata Prefecture, Itoigawa City

DATE: 1967; 5/?

RIVER OR LAKE: Odokoro River

TYPE OF LANDSLIDE: Flow, debris

TRIGGER: ?

LANDSLIDE VOLUME (m^3): 3,600,000

DAM TYPE: ?

DAM HEIGHT (m): 30

DAM LENGTH (m): 150

DAM WIDTH (m): 200

LAKE LENGTH (m): 900

LAKE VOLUME (m^3): 900,000

TIME TO FAILURE (days): ?

FAILURE MECHANISM: ?

BREACH DIMENSIONS: ?

CONTROLS: ?

DAM MATERIALS: Sandstone and shale.

REFERENCES: Ministry of Construction (Japan), 1987.

COMMENTS: Power plant upstream was almost inundated by upstream flooding. Roads and houses downstream were damaged by debris flow from failure of dam.

07/15/91

COUNTRY: Japan

SUBDIVISION: Niigata Prefecture, Kamikawa Village

DATE: 1961; 6/?

RIVER OR LAKE: Tokonami River, trib. of Agano River

TYPE OF LANDSLIDE: Slide, rock and earth

TRIGGER: Rainfall

LANDSLIDE VOLUME (m^3): 300,000

DAM TYPE: II

DAM HEIGHT (m): 20

DAM LENGTH (m): 50

DAM WIDTH (m): 170

LAKE LENGTH (m): 700

LAKE VOLUME (m^3): 350,000

TIME TO FAILURE (days): 30

FAILURE MECHANISM: Overtopping

BREACH DIMENSIONS: ?

CONTROLS: -

DAM MATERIALS: Sandstone and mudstone.

REFERENCES: Ministry of Construction (Japan), 1987.

COMMENTS: Rice field downstream was inundated by failure of dam.

07/15/91

COUNTRY: Japan

SUBDIVISION: Niigata Prefecture, Nagaoka City

DATE: 1984; 5/17

RIVER OR LAKE: Shinano River

TYPE OF LANDSLIDE: Slump

TRIGGER: ?

LANDSLIDE VOLUME (m^3): 500,000

DAM TYPE: II

DAM HEIGHT (m): 15

DAM LENGTH (m): ?

DAM WIDTH (m): 230

LAKE LENGTH (m): ?

LAKE VOLUME (m^3): ?

TIME TO FAILURE (days): ?

FAILURE MECHANISM: ?

BREACH DIMENSIONS: ?

CONTROLS: ?

DAM MATERIALS: Colluvium from mudstone and tuffaceous sandstone.

REFERENCES: Japan Landslide Society, 1988.

COMMENTS: -

07/15/91

COUNTRY: Japan

SUBDIVISION: Oita Prefecture, Honjo Village

DATE: 1943; 9/19-20

RIVER OR LAKE: Banjo River

TYPE OF LANDSLIDE: Slide, rock and earth

TRIGGER: Rainfall

LANDSLIDE VOLUME (m^3): 1,500,000

DAM TYPE: II

DAM HEIGHT (m): 80

DAM LENGTH (m): 400

DAM WIDTH (m): 250

LAKE LENGTH (m): 2,500

LAKE VOLUME (m^3): 14,000,000

TIME TO FAILURE (days): ?

FAILURE MECHANISM: ?

BREACH DIMENSIONS: ?

CONTROLS: -

DAM MATERIALS: Sedimentary rocks.

REFERENCES: Ministry of Construction (Japan), 1987.

COMMENTS: Five people buried by landslide; school building inundated by upstream flooding; large flood due to dam failure.

07/15/91

COUNTRY: Japan

SUBDIVISION: Shiga Prefecture, near Otsu

DATE: 1662

RIVER OR LAKE: ?

TYPE OF LANDSLIDE: ?

TRIGGER: Earthquake

LANDSLIDE VOLUME (m^3): ?

DAM TYPE: ?

DAM HEIGHT (m): ?

DAM LENGTH (m): ?

DAM WIDTH (m): ?

LAKE LENGTH (m): ?

LAKE VOLUME (m^3): ?

TIME TO FAILURE (days): ?

FAILURE MECHANISM: ?

BREACH DIMENSIONS: ?

CONTROLS: ?

DAM MATERIALS: ?

REFERENCES: Fujita, 1985.

COMMENTS: Landslide caused 300 deaths; collapse of natural dam caused damage.

07/15/91

COUNTRY: Japan

SUBDIVISION: Shizuoka Prefecture, Izu Peninsula, Nanamawari

DATE: 1978; 1/14

RIVER OR LAKE: Tajiri River

TYPE OF LANDSLIDE: Slide, debris; avalanche, debris

TRIGGER: Earthquake

LANDSLIDE VOLUME (m^3): 50,000

DAM TYPE: II

DAM HEIGHT (m): 10

DAM LENGTH (m): 20

DAM WIDTH (m): 125

LAKE LENGTH (m): ?

LAKE VOLUME (m^3): ?

TIME TO FAILURE (days): Did not fail.

FAILURE MECHANISM: -

BREACH DIMENSIONS: -

CONTROLS: Spillway dug immediately after landslide; no lake formed.

DAM MATERIALS: Reworked volcanic debris.

REFERENCES: Chigira, 1982; Chigira, Masahiro, 1989, Central Research Institute of Electric Power Authority, personal

COMMENTS: -

07/15/91

COUNTRY: Japan

SUBDIVISION: Shizuoka Prefecture, Shizuoka City

DATE: 1702

RIVER OR LAKE: Abe River

TYPE OF LANDSLIDE: ?

TRIGGER: Earthquake

LANDSLIDE VOLUME (m^3): 120,000,000

DAM TYPE: III

DAM HEIGHT (m): 30

DAM LENGTH (m): 500

DAM WIDTH (m): 650

LAKE LENGTH (m): ?

LAKE VOLUME (m^3): 4,700,000

TIME TO FAILURE (days): Did not fail.

FAILURE MECHANISM: -

BREACH DIMENSIONS: -

CONTROLS: -

DAM MATERIALS: Sandstone and slate.

REFERENCES: Ministry of Construction (Japan), 1987.

COMMENTS: Earthquake occurred during heavy rainfall.

07/15/91

COUNTRY: Japan

SUBDIVISION: Tochigi Prefecture, Fujiwara Town

DATE: 1683; 9/1

RIVER OR LAKE: Ojika River; Ikari Lake

TYPE OF LANDSLIDE: Slide, rock

TRIGGER: Earthquake

LANDSLIDE VOLUME (m^3): 3,300,000

DAM TYPE: II

DAM HEIGHT (m): 70

DAM LENGTH (m): 400

DAM WIDTH (m): 700

LAKE LENGTH (m): ?

LAKE VOLUME (m^3): 64,000,000

TIME TO FAILURE (days): 14,600

FAILURE MECHANISM: Overtopping

BREACH DIMENSIONS: ?

CONTROLS: Spillway constructed.

DAM MATERIALS: Rhyolite.

REFERENCES: Fujita, 1985; Ministry of Construction, 1987; Nakayama, 1988.

COMMENTS: Heavy rain 40 years later caused downcutting of spillway and dam failure. 102 houses flooded; 1005 killed by dam failure flood.

07/15/91

COUNTRY: Japan

SUBDIVISION: Tochigi Prefecture, Nikko City

DATE: 1949; 12/26

RIVER OR LAKE: Oya River

TYPE OF LANDSLIDE: Slide, rock and earth

TRIGGER: Earthquake

LANDSLIDE VOLUME (m^3): 9,000

DAM TYPE: II

DAM HEIGHT (m): 10

DAM LENGTH (m): 50

DAM WIDTH (m): 100

LAKE LENGTH (m): ?

LAKE VOLUME (m^3): 3,300

TIME TO FAILURE (days): Did not fail.

FAILURE MECHANISM: -

BREACH DIMENSIONS: -

CONTROLS: -

DAM MATERIALS: Scoria.

REFERENCES: Ministry of Construction (Japan), 1987.

COMMENTS: -

07/15/91

COUNTRY: Japan

SUBDIVISION: Tokushima Prefecture, Kainan town

DATE: 1892; 7/25

RIVER OR LAKE: Kaifu River

TYPE OF LANDSLIDE: Slide, rock and earth

TRIGGER: ?

LANDSLIDE VOLUME (m^3): 2,000,000

DAM TYPE: II

DAM HEIGHT (m): 45

DAM LENGTH (m): 250

DAM WIDTH (m): 350

LAKE LENGTH (m): 5,000

LAKE VOLUME (m^3): 14,000,000

TIME TO FAILURE (days): ?

FAILURE MECHANISM: ?

BREACH DIMENSIONS: ?

CONTROLS: -

DAM MATERIALS: Sedimentary rocks.

REFERENCES: Ministry of Construction (Japan), 1987.

COMMENTS: 47 people died and four houses buried by landslide; eight houses inundated by upstream flooding.

07/15/91

COUNTRY: Japan

SUBDIVISION: Tokushima Prefecture, Kaminaka town

DATE: 1893; 7/25

RIVER OR LAKE: Naka River

TYPE OF LANDSLIDE: Slide, rock and earth

TRIGGER: Rainfall

LANDSLIDE VOLUME (m^3): 4,000,000

DAM TYPE: II

DAM HEIGHT (m): 80

DAM LENGTH (m): 250

DAM WIDTH (m): 330

LAKE LENGTH (m): 10,000

LAKE VOLUME (m^3): 75,000,000

TIME TO FAILURE (days): 3

FAILURE MECHANISM: ?

BREACH DIMENSIONS: ?

CONTROLS: -

DAM MATERIALS: Sedimentary rocks.

REFERENCES: Ministry of Construction (Japan), 1987.

COMMENTS: 15 houses buried and 65 people killed by landslide; 150 houses inundated by upstream flooding; don't know effects of dam failure downstream.

07/15/91

COUNTRY: Japan

SUBDIVISION: Toyama Prefecture, Oyama Town

DATE: 1858; 2/26

RIVER OR LAKE: Ma River

TYPE OF LANDSLIDE: Avalanche, debris

TRIGGER: Earthquake

LANDSLIDE VOLUME (m^3): 150,000,000

DAM TYPE: III

DAM HEIGHT (m): 110

DAM LENGTH (m): 600

DAM WIDTH (m): 200

LAKE LENGTH (m): 2,000

LAKE VOLUME (m^3): 2,600,000

TIME TO FAILURE (days): 59

FAILURE MECHANISM: ?

BREACH DIMENSIONS: ?

CONTROLS: -

DAM MATERIALS: Volcanics and fractured granodiorite.

REFERENCES: Yazawa and Mizuyama, 1986; Ouchi, 1987; Ministry of Construction (Japan), 1987.

COMMENTS: Failure of the Yu and Ma River dams caused two separate floods that flooded 156 downstream villages and drowned 140 people.

07/15/91

COUNTRY: Japan

SUBDIVISION: Toyama Prefecture, Oyama Town

DATE: 1858; 2/26

RIVER OR LAKE: Yu River

TYPE OF LANDSLIDE: Avalanche, debris

TRIGGER: Earthquake

LANDSLIDE VOLUME (m^3): 150,000,000

DAM TYPE: ?

DAM HEIGHT (m): 125

DAM LENGTH (m): 600

DAM WIDTH (m): 700

LAKE LENGTH (m): 1,000

LAKE VOLUME (m^3): 27,000,000

TIME TO FAILURE (days): 12

FAILURE MECHANISM: ?

BREACH DIMENSIONS: ?

CONTROLS: -

DAM MATERIALS: Volcanic rocks and granodiorite.

REFERENCES: Yazawa and Mizuyama, 1986; Ouchi, 1987; Ministry of Construction (Japan), 1987.

COMMENTS: Formed at same time as Ma River Dam, but failed later. Flooded 156 villages downstream and drowned 140 people.

07/15/91

COUNTRY: Japan

SUBDIVISION: Wakayama Prefecture, Hanazono Village

DATE: 1953; 7/18

RIVER OR LAKE: Arida River

TYPE OF LANDSLIDE: Slide, rock

TRIGGER: Rainfall

LANDSLIDE VOLUME (m^3): 640,000

DAM TYPE: II

DAM HEIGHT (m): 10

DAM LENGTH (m): 80

DAM WIDTH (m): 100

LAKE LENGTH (m): 300

LAKE VOLUME (m^3): 47,000

TIME TO FAILURE (days): 0.01

FAILURE MECHANISM: Overtopping

BREACH DIMENSIONS: ?

CONTROLS: -

DAM MATERIALS: Sandstone.

REFERENCES: Ministry of Construction (Japan), 1987.

COMMENTS: 98 people died and one village wiped out due to landslide.

07/15/91

COUNTRY: Japan

SUBDIVISION: Wakayama Prefecture, Hanazono Village

DATE: 1953; 7/18

RIVER OR LAKE: Shiratani River, trib. of Arida River

TYPE OF LANDSLIDE: Slide, rock

TRIGGER: Rainfall

LANDSLIDE VOLUME (m^3): 250,000

DAM TYPE: II

DAM HEIGHT (m): 25

DAM LENGTH (m): 100

DAM WIDTH (m): 100

LAKE LENGTH (m): 200

LAKE VOLUME (m^3): 60,000

TIME TO FAILURE (days): Did not fail.

FAILURE MECHANISM: -

BREACH DIMENSIONS: -

CONTROLS: -

DAM MATERIALS: Sandstone and slate.

REFERENCES: Ministry of Construction (Japan), 1987.

COMMENTS: Dam still existed in 1957. No data after that.

07/15/91

COUNTRY: Japan

SUBDIVISION: Wakayama Prefecture, Hanazono Village

DATE: 1953; 7/19

RIVER OR LAKE: Nakaya River

TYPE OF LANDSLIDE: Slide, rock

TRIGGER: Rainfall

LANDSLIDE VOLUME (m^3): 460,000

DAM TYPE: II

DAM HEIGHT (m): 40

DAM LENGTH (m): 100

DAM WIDTH (m): 200

LAKE LENGTH (m): 400

LAKE VOLUME (m^3): 270,000

TIME TO FAILURE (days): 68

FAILURE MECHANISM: ?

BREACH DIMENSIONS: ?

CONTROLS: -

DAM MATERIALS: Sandstone and slate.

REFERENCES: Ministry of Construction (Japan), 1987.

COMMENTS: -

07/15/91

COUNTRY: Japan

SUBDIVISION: Wakayama Prefecture, Hanazono Village

DATE: 1953; 7/19

RIVER OR LAKE: Arida River

TYPE OF LANDSLIDE: ?

TRIGGER: Rainfall

LANDSLIDE VOLUME (m^3): 1,400,000

DAM TYPE: ?

DAM HEIGHT (m): 20

DAM LENGTH (m): ?

DAM WIDTH (m): ?

LAKE LENGTH (m): ?

LAKE VOLUME (m^3): ?

TIME TO FAILURE (days): 0.01

FAILURE MECHANISM: ?

BREACH DIMENSIONS: ?

CONTROLS: -

DAM MATERIALS: Sandstone and slate.

REFERENCES: Ministry of Construction (Japan), 1987.

COMMENTS: Apparently dam failed so quickly that no real lake formed.

07/15/91

COUNTRY: Japan

SUBDIVISION: Wakayama Prefecture, Hanazono Village

DATE: 1953; 7/20

RIVER OR LAKE: Arida River

TYPE OF LANDSLIDE: Slide, rock and earth

TRIGGER: Rainfall

LANDSLIDE VOLUME (m^3): 5,200,000

DAM TYPE: II

DAM HEIGHT (m): 60

DAM LENGTH (m): 300

DAM WIDTH (m): 350

LAKE LENGTH (m): 5,000

LAKE VOLUME (m^3): 17,000,000

TIME TO FAILURE (days): 67

FAILURE MECHANISM: Overtopping

BREACH DIMENSIONS: ?

CONTROLS: -

DAM MATERIALS: Sedimentary rocks.

REFERENCES: Ministry of Construction (Japan), 1987.

COMMENTS: Flood due to dam failure was 7-10 m higher than rainfall-caused flood of July 18, 1953.
Dam-failure flood inundated many houses and farms.

07/15/91

COUNTRY: Japan

SUBDIVISION: Yamagata Prefecture, Ooe Town

DATE: 1984; 4/11

RIVER OR LAKE: Kose River

TYPE OF LANDSLIDE: Slump

TRIGGER: Snowmelt

LANDSLIDE VOLUME (m^3): 5,600,000

DAM TYPE: II

DAM HEIGHT (m): 20

DAM LENGTH (m): ?

DAM WIDTH (m): 90

LAKE LENGTH (m): 500

LAKE VOLUME (m^3): ?

TIME TO FAILURE (days): Did not fail.

FAILURE MECHANISM: -

BREACH DIMENSIONS: -

CONTROLS: Soil, well, and pile works were carried out to stabilize dam.

DAM MATERIALS: Mudstone, siltstone, tuff.

REFERENCES: Kumagai, 1985; Japan Landslide Society, 1988; A. Kumagai, Yamagata Prefectural Government, unpub. data, 198

COMMENTS: Lake existed in 1985, has since been drained.

07/15/91

COUNTRY: Nepal

SUBDIVISION: Central Nepal, Ghatlang Village (near Dhunche)

DATE: 1985; 8/4

RIVER OR LAKE: Trisuli (Bhote Kosi) River

TYPE OF LANDSLIDE: ?

TRIGGER: ?

LANDSLIDE VOLUME (m^3): ?

DAM TYPE: ?

DAM HEIGHT (m): ?

DAM LENGTH (m): ?

DAM WIDTH (m): ?

LAKE LENGTH (m): 2,500

LAKE VOLUME (m^3): ?

TIME TO FAILURE (days): 0.25 - 0.50

FAILURE MECHANISM: Overtopping

BREACH DIMENSIONS: ?

CONTROLS: -

DAM MATERIALS: ?

REFERENCES: Galay, 1985; Rising Nepal, 1985.

COMMENTS: Dam overtopped in 5 hours, partial failure occurred after overtopping. Normal flow in Trisuli River at that time of year is 453 cu m/s. Landslide occurred at 0300 hrs; overtopping occurred at 0830 hrs. Maximum flood was 2,010 cu m/s. Flow dropped to 510 cu m/s by 1500 hrs. Estimated time to failure: 6-12 hrs.

07/15/91

COUNTRY: Nepal

SUBDIVISION: Central Nepal, Lesser Himalayas

DATE: 1978; ?

RIVER OR LAKE: Chirling Khola (River)

TYPE OF LANDSLIDE: Slide, rock

TRIGGER: Rainfall

LANDSLIDE VOLUME (m^3): 20,000

DAM TYPE: II

DAM HEIGHT (m): 6

DAM LENGTH (m): 10

DAM WIDTH (m): 60

LAKE LENGTH (m): 100

LAKE VOLUME (m^3): 4,000

TIME TO FAILURE (days): 350

FAILURE MECHANISM: ?

BREACH DIMENSIONS: ?

CONTROLS: -

DAM MATERIALS: Slate and phyllite.

REFERENCES: Dikshit, Amod, 1990, personal commun., Dept. of Mines and Geology, Lainchaur, Nepal.

COMMENTS: Overspilling continued for one year. Dam totally removed by next year's monsoon floods. One man drowned. Trail blocked for 1 year.

07/15/91

COUNTRY: Nepal

SUBDIVISION: Central Nepal, north of Kathmandu

DATE: 1927; 7/25

RIVER OR LAKE: Tadi Khola River, trib. of Trisuli River

TYPE OF LANDSLIDE: Slide, rock

TRIGGER: Rainfall

LANDSLIDE VOLUME (m^3): ?

DAM TYPE: II

DAM HEIGHT (m): ?

DAM LENGTH (m): ?

DAM WIDTH (m): ?

LAKE LENGTH (m): 250

LAKE VOLUME (m^3): ?

TIME TO FAILURE (days): 0.2

FAILURE MECHANISM: ?

BREACH DIMENSIONS: ?

CONTROLS: ?

DAM MATERIALS: Schist and gneiss.

REFERENCES: A. Dikshit, 1990, personal commun., Dept. of Mines and Geology, Lainchaur, Nepal.

COMMENTS: Sudden breach. 5 houses, 3 people, and 30 cattle washed downstream.

07/15/91

COUNTRY: Nepal

SUBDIVISION: Eastern Nepal, Lesser Himalaya, near Olanchungola

DATE: 1980; 6/23-24

RIVER OR LAKE: Yangma Khola River, trib. of Tamar River

TYPE OF LANDSLIDE: Slide, rock and debris

TRIGGER: Rainfall

LANDSLIDE VOLUME (m^3): ?

DAM TYPE: II

DAM HEIGHT (m): ?

DAM LENGTH (m): ?

DAM WIDTH (m): ?

LAKE LENGTH (m): ?

LAKE VOLUME (m^3): ?

TIME TO FAILURE (days): 1

FAILURE MECHANISM: ?

BREACH DIMENSIONS: ?

CONTROLS: -

DAM MATERIALS: ?

REFERENCES: W. Revie, written commun., 1980.

COMMENTS: Dam existed for only a few hours; failure caused a debris flow on Tamur River on Jun 24, 1980.

07/15/91

COUNTRY: Nepal

SUBDIVISION: Eastern Nepal, Lesser Himalayas

DATE: 1984; 8/?

RIVER OR LAKE: Sunkoshi River (at confluence with Gresun Khola)

TYPE OF LANDSLIDE: Slide, rock

TRIGGER: Rainfall

LANDSLIDE VOLUME (m^3): 12,000,000

DAM TYPE: I

DAM HEIGHT (m): 8

DAM LENGTH (m): 300

DAM WIDTH (m): 300

LAKE LENGTH (m): 1,000

LAKE VOLUME (m^3): 2,400,000

TIME TO FAILURE (days): 0.08

FAILURE MECHANISM: Overtopping

BREACH DIMENSIONS: ?

CONTROLS: -

DAM MATERIALS: Quartzite and schist.

REFERENCES: A. Dikshit, 1990, unpub. data, Dept. of Mines and Geology, Lainchaur, Nepal.

COMMENTS: River pushed onto right bank.

07/15/91

COUNTRY: Nepal

SUBDIVISION: Eastern Nepal, Lesser Himalayas

DATE: 1984; 8/16

RIVER OR LAKE: Sunkoshi River (confluence with Majhuwa Khola)

TYPE OF LANDSLIDE: Slide, rock

TRIGGER: Rainfall

LANDSLIDE VOLUME (m^3): 3,000,000

DAM TYPE: I

DAM HEIGHT (m): 8

DAM LENGTH (m): 300

DAM WIDTH (m): 200

LAKE LENGTH (m): 1,000

LAKE VOLUME (m^3): 1,500,000

TIME TO FAILURE (days): 0.08

FAILURE MECHANISM: ?

BREACH DIMENSIONS: ?

CONTROLS: -

DAM MATERIALS: Limestone, phyllite, and slate.

REFERENCES: A. Dikshit, 1990, unpub. data, Dept. of Mines and Geology, Lainchaur, Nepal.

COMMENTS: Period of total damming was 2 hours. Breach was gradual. Sunkoshi River was pushed to the right bank.

07/15/91

COUNTRY: Nepal

SUBDIVISION: Eastern Nepal, Lesser Himalayas, Dhankuta Gorge

DATE: 1974

RIVER OR LAKE: Dhankuta Khola (River)

TYPE OF LANDSLIDE: Slide, rock

TRIGGER: Rainfall

LANDSLIDE VOLUME (m^3): ?

DAM TYPE: II

DAM HEIGHT (m): ?

DAM LENGTH (m): ?

DAM WIDTH (m): ?

LAKE LENGTH (m): ?

LAKE VOLUME (m^3): ?

TIME TO FAILURE (days): ?

FAILURE MECHANISM: ?

BREACH DIMENSIONS: ?

CONTROLS: -

DAM MATERIALS: Metamorphic rocks

REFERENCES: Brunsden and others, 1981.

COMMENTS: Dam failed within 1 year; could have been within hours.

07/15/91

COUNTRY: Nepal

SUBDIVISION: Western Nepal, Lesser Himalayas, Middle Hills

DATE: 1968; 3/15

RIVER OR LAKE: Labu Khola, trib. of Budhigandaki River

TYPE OF LANDSLIDE: Slide, rock

TRIGGER: Rainfall

LANDSLIDE VOLUME (m^3): >1,000,000

DAM TYPE: ?

DAM HEIGHT (m): 60

DAM LENGTH (m): 90

DAM WIDTH (m): 150

LAKE LENGTH (m): ?

LAKE VOLUME (m^3): ?

TIME TO FAILURE (days): 3.5 (first failure)

FAILURE MECHANISM: Piping and overtopping.

BREACH DIMENSIONS: ?

CONTROLS: -

DAM MATERIALS: Metamorphic sandstones and phyllite.

REFERENCES: Sharma, 1977, p. 22; A. Dikshit, 1990, unpub. data, Dept. of Mines and Geology, Lainchaur, Nepal.

COMMENTS: Many houses and much property flooded in low-lying areas of Arughat bazar when dam failed. Failure of dam occurred more than once: Mar 18, 1968, July 17, 1968, and Aug 1. 1968. The Aug 1, 1968, failure was the final washout of the dam.

07/15/91

COUNTRY: Nepal

SUBDIVISION: Western Nepal, Lesser Himalayas, Middle Hills, Baglung

DATE: 1930; 8/?

RIVER OR LAKE: Saptagandaki River tributary

TYPE OF LANDSLIDE: Slide, rock

TRIGGER: Rainfall

LANDSLIDE VOLUME (m^3): ?

DAM TYPE: ?

DAM HEIGHT (m): ?

DAM LENGTH (m): ?

DAM WIDTH (m): ?

LAKE LENGTH (m): ?

LAKE VOLUME (m^3): ?

TIME TO FAILURE (days): ?

FAILURE MECHANISM: ?

BREACH DIMENSIONS: ?

CONTROLS: ?

DAM MATERIALS: Metasedimentary rocks.

REFERENCES: A. Dikshit, 1990, unpub. data, Dept. of Mines and Geology, Lainchaur, Nepal.

COMMENTS: Dickshit got this information from Gorakhapatra Daily. Trail to Baglung was blocked for several days.

07/15/91

COUNTRY: Nepal

SUBDIVISION: Western Nepal, Middle Hills, near Kushma

DATE: 1936; 7/1

RIVER OR LAKE: Kaligandaki River

TYPE OF LANDSLIDE: Slide, rock

TRIGGER: Rainfall (?)

LANDSLIDE VOLUME (m^3): ?

DAM TYPE: I

DAM HEIGHT (m): ?

DAM LENGTH (m): ?

DAM WIDTH (m): ?

LAKE LENGTH (m): ?

LAKE VOLUME (m^3): ?

TIME TO FAILURE (days): 1.25

FAILURE MECHANISM: ?

BREACH DIMENSIONS: ?

CONTROLS: -

DAM MATERIALS: ?

REFERENCES: A. Dikshit, 1990, unpub. data, Dept. of Mines and Geology, Lainchaur, Nepal.

COMMENTS: Dam break was sudden, resulting in heavy damage downstream. Three people drowned near Kushma.

07/15/91

COUNTRY: New Zealand

SUBDIVISION: Canterbury Statistical Area, South Island

DATE: 1929; 3/9

RIVER OR LAKE: Thompson Stream, trib. of Poulter River

TYPE OF LANDSLIDE: Slide, rock /avalanche, rock

TRIGGER: Earthquake

LANDSLIDE VOLUME (m^3): ?

DAM TYPE: II

DAM HEIGHT (m): 30

DAM LENGTH (m): ?

DAM WIDTH (m): 400

LAKE LENGTH (m): ?

LAKE VOLUME (m^3): (area = < 0.1 sq km)

TIME TO FAILURE (days): ?

FAILURE MECHANISM: ?

BREACH DIMENSIONS: ?

CONTROLS: ?

DAM MATERIALS: Graywackes and argillites

REFERENCES: Speicht, 1933; Adams, 1981.

COMMENTS: -

07/15/91

COUNTRY: New Zealand

SUBDIVISION: East Coast Statistical Area, North Island, Waerengaokur

DATE: 1988; 3/?

RIVER OR LAKE: Hangaroa River

TYPE OF LANDSLIDE: Slide, rock

TRIGGER: Rainfall

LANDSLIDE VOLUME (m^3): ?

DAM TYPE: II

DAM HEIGHT (m): ?

DAM LENGTH (m): ?

DAM WIDTH (m): ?

LAKE LENGTH (m): 6,000

LAKE VOLUME (m^3): ?

TIME TO FAILURE (days): ?

FAILURE MECHANISM: ?

BREACH DIMENSIONS: ?

CONTROLS: Dug spillway.

DAM MATERIALS: Tertiary mudstone.

REFERENCES: N.A. Trustram, Division of Land and Soil Sciences, Palmerston North, unpub. data, 1990.

COMMENTS: -

07/15/91

COUNTRY: New Zealand

SUBDIVISION: Hawke's Bay Statistical Area, North Island

DATE: 1968; 7/1

RIVER OR LAKE: Tuki Tuki River; Lake Folger

TYPE OF LANDSLIDE: Slide, rock /avalanche, debris

TRIGGER: Undercutting

LANDSLIDE VOLUME (m^3): 765,000

DAM TYPE: II

DAM HEIGHT (m): 15

DAM LENGTH (m): ?

DAM WIDTH (m): ?

LAKE LENGTH (m): ?

LAKE VOLUME (m^3): ? (area = 0.2 sq km; depth = 15 m

TIME TO FAILURE (days): Did not fail.

FAILURE MECHANISM: -

BREACH DIMENSIONS: -

CONTROLS: Spillway dug across sandy siltstone right abutment.

DAM MATERIALS: Sandstone and argillite debris.

REFERENCES: Drummond, 1968; Adams, 1981.

COMMENTS: Spillway 9 m wide at bottom.

07/15/91

COUNTRY: New Zealand

SUBDIVISION: Hawke's Bay Statistical Area, North Island

DATE: 1931

RIVER OR LAKE: Te Hoe River; Lake Ngatapa

TYPE OF LANDSLIDE: ?

TRIGGER: Earthquake

LANDSLIDE VOLUME (m^3): ?

DAM TYPE: ?

DAM HEIGHT (m): 25

DAM LENGTH (m): ?

DAM WIDTH (m): ?

LAKE LENGTH (m): 2,000

LAKE VOLUME (m^3): 5,000,000 - 6,000,000 (2 sq km)

TIME TO FAILURE (days): 2,555

FAILURE MECHANISM: ?

BREACH DIMENSIONS: ?

CONTROLS: ?

DAM MATERIALS: Sedimentary rocks

REFERENCES: Grant, 1939; Adams, 1981.

COMMENTS: Dam was washed out by a major flood in 1938.

07/15/91

COUNTRY: New Zealand

SUBDIVISION: Hawke's Bay Statistical Area, North Island, 11 km N of

DATE: 1976; 8/5

RIVER OR LAKE: Coppermine Creek, trib. of Manga-Atua Stream

TYPE OF LANDSLIDE: Slump

TRIGGER: Rainfall

LANDSLIDE VOLUME (m^3): 35,000

DAM TYPE: III

DAM HEIGHT (m): 10

DAM LENGTH (m): ?

DAM WIDTH (m): ?

LAKE LENGTH (m): ?

LAKE VOLUME (m^3): ?

TIME TO FAILURE (days): ?

FAILURE MECHANISM: ?

BREACH DIMENSIONS: ?

CONTROLS: ?

DAM MATERIALS: ?

REFERENCES: Mosley and Blakeley, 1977.

COMMENTS: Not known if dam failed.

07/15/91

COUNTRY: New Zealand

SUBDIVISION: Hawke's Bay Statistical Area, North Island, near Kairak

DATE: 1976; 10/24

RIVER OR LAKE: Ponui Stream

TYPE OF LANDSLIDE: Slide, block /slide, debris

TRIGGER: Rainfall

LANDSLIDE VOLUME (m^3): 2,500,000

DAM TYPE: II

DAM HEIGHT (m): 50 - 60

DAM LENGTH (m): ?

DAM WIDTH (m): 570

LAKE LENGTH (m): ?

LAKE VOLUME (m^3): 2,890,000 (present depth = 35 m)

TIME TO FAILURE (days): Did not fail.

FAILURE MECHANISM: -

BREACH DIMENSIONS: -

CONTROLS: 15-m deep spillway dug through landslide and sandstone ridge.

DAM MATERIALS: Very weathered sandstone and mudstone.

REFERENCES: deLeon, 1977; Pettinga, 1987.

COMMENTS: Slide was reactivation of old landslide that occurred during 1931 earthquake. Excavation lowered lake level about 5 m.

07/15/91

COUNTRY: New Zealand

SUBDIVISION: Nelson Statistical Area, South Island

DATE: 1913; 2/22

RIVER OR LAKE: Drysdale Creek; Drysdale Lake

TYPE OF LANDSLIDE: Slide

TRIGGER: Earthquake (?)

LANDSLIDE VOLUME (m^3): ?

DAM TYPE: ?

DAM HEIGHT (m): ?

DAM LENGTH (m): ?

DAM WIDTH (m): ?

LAKE LENGTH (m): ?

LAKE VOLUME (m^3): ?

TIME TO FAILURE (days): ?

FAILURE MECHANISM: ?

BREACH DIMENSIONS: ?

CONTROLS: ?

DAM MATERIALS: Paleozoic graywacke.

REFERENCES: Henderson, 1937; Adams, 1981.

COMMENTS: -

07/15/91

COUNTRY: New Zealand

SUBDIVISION: Nelson Statistical Area, South Island

DATE: 1929; 6/17

RIVER OR LAKE: Glasseye Creek; Glasseye Lake

TYPE OF LANDSLIDE: ?

TRIGGER: Earthquake (Buller earthquake)

LANDSLIDE VOLUME (m^3): ?

DAM TYPE: ?

DAM HEIGHT (m): ?

DAM LENGTH (m): ?

DAM WIDTH (m): ?

LAKE LENGTH (m): ?

LAKE VOLUME (m^3): ? (area = 0.1 sq km)

TIME TO FAILURE (days): ?

FAILURE MECHANISM: ?

BREACH DIMENSIONS: ?

CONTROLS: ?

DAM MATERIALS: Sedimentary rocks.

REFERENCES: Henderson, 1937; Adams, 1981.

COMMENTS: -

07/15/91

COUNTRY: New Zealand

SUBDIVISION: Nelson Statistical Area, South Island

DATE: 1929; 6/17

RIVER OR LAKE: Matakitaki River; Mud Lake

TYPE OF LANDSLIDE: Slide, rock

TRIGGER: Earthquake (Buller Earthquake)

LANDSLIDE VOLUME (m^3): ?

DAM TYPE: II

DAM HEIGHT (m): 25

DAM LENGTH (m): ?

DAM WIDTH (m): ?

LAKE LENGTH (m): 5,000

LAKE VOLUME (m^3): ? (area = 4.5 sq km)

TIME TO FAILURE (days): ?

FAILURE MECHANISM: ?

BREACH DIMENSIONS: ?

CONTROLS: ?

DAM MATERIALS: Tertiary argillaceous sandstone.

REFERENCES: Henderson, 1937; Adams, 1981.

COMMENTS: Dam filled in 4 days; destroyed by drainage and sedimentation.

07/15/91

COUNTRY: New Zealand

SUBDIVISION: Nelson Statistical Area, South Island

DATE: 1929; 6/17

RIVER OR LAKE: Maruia River

TYPE OF LANDSLIDE: Slide, rock

TRIGGER: Earthquake

LANDSLIDE VOLUME (m^3): ?

DAM TYPE: II

DAM HEIGHT (m): ?

DAM LENGTH (m): ?

DAM WIDTH (m): ?

LAKE LENGTH (m): ?

LAKE VOLUME (m^3): ?

TIME TO FAILURE (days): 2

FAILURE MECHANISM: ?

BREACH DIMENSIONS: ?

CONTROLS: ?

DAM MATERIALS: Sedimentary rocks.

REFERENCES: Henderson, 1937.

COMMENTS: Landslide killed two people.

07/15/91

COUNTRY: New Zealand

SUBDIVISION: Nelson Statistical Area, South Island

DATE: 1929; 6/17

RIVER OR LAKE: Mokihinui River; Lake Perrine

TYPE OF LANDSLIDE: Slide, rock

TRIGGER: Earthquake

LANDSLIDE VOLUME (m^3): ?

DAM TYPE: II

DAM HEIGHT (m): 23

DAM LENGTH (m): 100

DAM WIDTH (m): ?

LAKE LENGTH (m): 11,000

LAKE VOLUME (m^3): ? (area = > 2 sq km)

TIME TO FAILURE (days): 17 (partial failure)

FAILURE MECHANISM: ?

BREACH DIMENSIONS: ?

CONTROLS: ?

DAM MATERIALS: Sedimentary rocks

REFERENCES: Henderson, 1937; Adams, 1981.

COMMENTS: Jul 4, 1929, part of dam washed away and lake lowered 7.6 m; floodwaters flooded Seddonville.

07/15/91

COUNTRY: New Zealand

SUBDIVISION: Nelson Statistical Area, South Island

DATE: 1929; 6/17

RIVER OR LAKE: Stanley River; Lake Stanley

TYPE OF LANDSLIDE: Avalanche, debris ?

TRIGGER: Earthquake

LANDSLIDE VOLUME (m^3): ?

DAM TYPE: ?

DAM HEIGHT (m): 40

DAM LENGTH (m): ?

DAM WIDTH (m): ?

LAKE LENGTH (m): 2,000

LAKE VOLUME (m^3): ? (area = 0.6 sq km)

TIME TO FAILURE (days): ?

FAILURE MECHANISM: -

BREACH DIMENSIONS: -

CONTROLS: -

DAM MATERIALS: Contains blocks of hard Paleozoic conglomerate up to 7 m long.

REFERENCES: Adams, 1981.

COMMENTS: Maximum lake depth 40 m; Lake Stanley has existed for 60 years. Probably rocks in natural spillway are too resistant to erosion for failure.

07/15/91

COUNTRY: New Zealand

SUBDIVISION: Nelson Statistical Area, South Island

DATE: 1929; 6/17

RIVER OR LAKE: Matiri River; Matiri Lake (lower)

TYPE OF LANDSLIDE: Slide, rock

TRIGGER: Earthquake (Buller Earthquake)

LANDSLIDE VOLUME (m^3): ?

DAM TYPE: ?

DAM HEIGHT (m): ?

DAM LENGTH (m): ?

DAM WIDTH (m): ?

LAKE LENGTH (m): ?

LAKE VOLUME (m^3): ?

TIME TO FAILURE (days): Did not fail.

FAILURE MECHANISM: -

BREACH DIMENSIONS: -

CONTROLS: -

DAM MATERIALS: Tertiary sandstone.

REFERENCES: Henderson, 1937; Adams, 1981.

COMMENTS: Matiri Lake had formed from earlier landslide dam.
1929 earthquake raised level of dam.

07/15/91

COUNTRY: New Zealand

SUBDIVISION: Nelson Statistical Area, South Island

DATE: 1929; 6/17

RIVER OR LAKE: Falls Creek; Falls Lake

TYPE OF LANDSLIDE: ?

TRIGGER: Earthquake

LANDSLIDE VOLUME (m^3): ?

DAM TYPE: ?

DAM HEIGHT (m): ?

DAM LENGTH (m): ?

DAM WIDTH (m): ?

LAKE LENGTH (m): ?

LAKE VOLUME (m^3): ? (area = 0.2 sq km)

TIME TO FAILURE (days): ?

FAILURE MECHANISM: ?

BREACH DIMENSIONS: ?

CONTROLS: ?

DAM MATERIALS: Sedimentary rocks

REFERENCES: Henderson, 1937; Adams, 1981.

COMMENTS: -

07/15/91

COUNTRY: New Zealand

SUBDIVISION: Nelson Statistical Area, South Island

DATE: 1968; 5/?

RIVER OR LAKE: Buller River; Buller Lake

TYPE OF LANDSLIDE: Avalanche, debris

TRIGGER: Earthquake

LANDSLIDE VOLUME (m^3): 4,300,000

DAM TYPE: II

DAM HEIGHT (m): 12

DAM LENGTH (m): 100

DAM WIDTH (m): 250

LAKE LENGTH (m): 6,000

LAKE VOLUME (m^3): ? (area = 0.6 sq km)

TIME TO FAILURE (days): 0.9

FAILURE MECHANISM: ?

BREACH DIMENSIONS: ?

CONTROLS: -

DAM MATERIALS: Weathered granite and soil.

REFERENCES: Sutherland, 1969; Johnston, 1974; Adams, 1981.

COMMENTS: Buller Lake formed by landslide in 1968; formed again in 1971 by reactivation of same landslide due to heavy rainfall. No data on 1971 failure.

07/15/91

COUNTRY: New Zealand

SUBDIVISION: Nelson Statistical Area, South Island

DATE: 1971; 10/3

RIVER OR LAKE: Buller River; Buller Lake

TYPE OF LANDSLIDE: Avalanche, debris

TRIGGER: Rainfall

LANDSLIDE VOLUME (m^3): ?

DAM TYPE: III

DAM HEIGHT (m): ?

DAM LENGTH (m): 100

DAM WIDTH (m): 350

LAKE LENGTH (m): ?

LAKE VOLUME (m^3): ?

TIME TO FAILURE (days): ?

FAILURE MECHANISM: ?

BREACH DIMENSIONS: ?

CONTROLS: -

DAM MATERIALS: Weathered granite and soil.

REFERENCES: Sutherland, 1969; Johnston, 1974; Adams, 1981.

COMMENTS: Reactivation of 1968 earthquake-induced landslide dam. No information on failure of 1971 dam.

07/15/91

COUNTRY: New Zealand

SUBDIVISION: Nelson Statistical Area, South Island

DATE: 1929; 6/17

RIVER OR LAKE: Matiri River, Upper Matiri Lake

TYPE OF LANDSLIDE: Slide, rock

TRIGGER: Earthquake (Buller Earthquake)

LANDSLIDE VOLUME (m^3): ?

DAM TYPE: ?

DAM HEIGHT (m): ?

DAM LENGTH (m): ?

DAM WIDTH (m): ?

LAKE LENGTH (m): ?

LAKE VOLUME (m^3): ? (area = 0.3 sq km)

TIME TO FAILURE (days): Did not fail.

FAILURE MECHANISM: -

BREACH DIMENSIONS: -

CONTROLS: -

DAM MATERIALS: Tertiary sandstone.

REFERENCES: Henderson, 1937; Adams, 1981.

COMMENTS: Second dam on Matiri River.

07/15/91

COUNTRY: New Zealand

SUBDIVISION: Nelson Statistical Area, South Island

DATE: 1929; 6/17

RIVER OR LAKE: Sandstone Lake

TYPE OF LANDSLIDE: ?

TRIGGER: Earthquake

LANDSLIDE VOLUME (m^3): ?

DAM TYPE: ?

DAM HEIGHT (m): ?

DAM LENGTH (m): ?

DAM WIDTH (m): ?

LAKE LENGTH (m): ?

LAKE VOLUME (m^3): ? (area = < 0.1 sq km)

TIME TO FAILURE (days): ?

FAILURE MECHANISM: ?

BREACH DIMENSIONS: ?

CONTROLS: ?

DAM MATERIALS: Sedimentary rocks.

REFERENCES: Adams, 1981.

COMMENTS:

07/15/91

COUNTRY: New Zealand

SUBDIVISION: Nelson Statistical Area, South Island

DATE: 1929; 6/17

RIVER OR LAKE: Lower Lindsay Lake

TYPE OF LANDSLIDE: ?

TRIGGER: Earthquake

LANDSLIDE VOLUME (m^3): ?

DAM TYPE: ?

DAM HEIGHT (m): ?

DAM LENGTH (m): ?

DAM WIDTH (m): ?

LAKE LENGTH (m): ?

LAKE VOLUME (m^3): ? (area = < 0.1 sq km)

TIME TO FAILURE (days): ?

FAILURE MECHANISM: ?

BREACH DIMENSIONS: ?

CONTROLS: ?

DAM MATERIALS: Indurated sedimentary rocks.

REFERENCES: Adams, 1981.

COMMENTS:

07/15/91

COUNTRY: New Zealand

SUBDIVISION: Nelson Statistical Area, South Island

DATE: 1929; 6/17

RIVER OR LAKE: Lake Marina

TYPE OF LANDSLIDE: ?

TRIGGER: Earthquake

LANDSLIDE VOLUME (m^3): ?

DAM TYPE: ?

DAM HEIGHT (m): ?

DAM LENGTH (m): ?

DAM WIDTH (m): ?

LAKE LENGTH (m): ?

LAKE VOLUME (m^3): ? (area = < 0.1 sq km)

TIME TO FAILURE (days): ?

FAILURE MECHANISM: ?

BREACH DIMENSIONS: ?

CONTROLS: ?

DAM MATERIALS: Granite.

REFERENCES: Adams, 1981.

COMMENTS:

07/15/91

COUNTRY: New Zealand

SUBDIVISION: Nelson Statistical Area, South Island

DATE: 1929; 6/17

RIVER OR LAKE: Moonstone Lake

TYPE OF LANDSLIDE: ?

TRIGGER: Earthquake

LANDSLIDE VOLUME (m^3): ?

DAM TYPE: ?

DAM HEIGHT (m): ?

DAM LENGTH (m): ?

DAM WIDTH (m): ?

LAKE LENGTH (m): ?

LAKE VOLUME (m^3): ? (area = < 0.1 sq km)

TIME TO FAILURE (days): ?

FAILURE MECHANISM: ?

BREACH DIMENSIONS: ?

CONTROLS: ?

DAM MATERIALS: Indurated sedimentary rocks.

REFERENCES: Adams, 1981.

COMMENTS:

07/15/91

COUNTRY: New Zealand

SUBDIVISION: Nelson Statistical Area, South Island, Lyell

DATE: 1908

RIVER OR LAKE: Buller River

TYPE OF LANDSLIDE: ?

TRIGGER: ?

LANDSLIDE VOLUME (m^3): ?

DAM TYPE: ?

DAM HEIGHT (m): ?

DAM LENGTH (m): ?

DAM WIDTH (m): ?

LAKE LENGTH (m): ?

LAKE VOLUME (m^3): ?

TIME TO FAILURE (days): ?

FAILURE MECHANISM: ?

BREACH DIMENSIONS: ?

CONTROLS: ?

DAM MATERIALS: ?

REFERENCES: Henderson, 1937; Adams, 1981.

COMMENTS: "Completely dammed the river for over a day".

07/15/91

COUNTRY: New Zealand

SUBDIVISION: Nelson Statistical Area, South Island, near Inangahua

DATE: 1968; 5/24

RIVER OR LAKE: Ram Creek

TYPE OF LANDSLIDE: Avalanche, rock

TRIGGER: Earthquake

LANDSLIDE VOLUME (m^3): 5,000,000

DAM TYPE: III

DAM HEIGHT (m): 20 - 30

DAM LENGTH (m): 150

DAM WIDTH (m): 1,200

LAKE LENGTH (m): 325

LAKE VOLUME (m^3): ? (area = 0.034 sq km)

TIME TO FAILURE (days): 5,475

FAILURE MECHANISM: Overtopping

BREACH DIMENSIONS: Top = 100 m; bottom = 30 m; slopes = 20-30 m.

CONTROLS: -

DAM MATERIALS: Granite and graywacke.

REFERENCES: Brazier, 1989.

COMMENTS: Flood caused by failure damaged 65 ha of farmland downstream.

07/15/91

COUNTRY: New Zealand

SUBDIVISION: Wellington Statistical Area, North Island

DATE: 1855; 1/23

RIVER OR LAKE: Ruamahanga River, Lake Bruce

TYPE OF LANDSLIDE: Slide, rock

TRIGGER: Earthquake

LANDSLIDE VOLUME (m^3): ?

DAM TYPE: II

DAM HEIGHT (m): ?

DAM LENGTH (m): ?

DAM WIDTH (m): ?

LAKE LENGTH (m): ?

LAKE VOLUME (m^3): ? (area = < 0.1 sq km)

TIME TO FAILURE (days): Did not fail.

FAILURE MECHANISM: -

BREACH DIMENSIONS: -

CONTROLS: ?

DAM MATERIALS: Sedimentary rocks.

REFERENCES: Ongley, 1943; Adams, 1981.

COMMENTS: Dam did not fail; photo in Ongley shows trees growing on dam.

07/15/91

COUNTRY: Norway

SUBDIVISION: Gauldalen Valley

DATE: 1345

RIVER OR LAKE: Gaula River

TYPE OF LANDSLIDE: Spread, lateral

TRIGGER: ?

LANDSLIDE VOLUME (m^3): ?

DAM TYPE: III

DAM HEIGHT (m): ?

DAM LENGTH (m): ?

DAM WIDTH (m): ?

LAKE LENGTH (m): ?

LAKE VOLUME (m^3): ?

TIME TO FAILURE (days): ?

FAILURE MECHANISM: ?

BREACH DIMENSIONS: ?

CONTROLS: ?

DAM MATERIALS: Sensitive marine clay.

REFERENCES: Holmsen, 1952-53.

COMMENTS: Dam burst; very heavy downstream flooding. 48 farms destroyed; 250 killed.

07/15/91

COUNTRY: Norway

SUBDIVISION: Ulvadal Valley

DATE: 1960; 6/26

RIVER OR LAKE: Ulvadal River; Lake Ulvadalsvatn

TYPE OF LANDSLIDE: Slide, debris

TRIGGER: Rainfall

LANDSLIDE VOLUME (m^3): ?

DAM TYPE: II

DAM HEIGHT (m): 2 - 3

DAM LENGTH (m): ?

DAM WIDTH (m): ?

LAKE LENGTH (m): ?

LAKE VOLUME (m^3): ?

TIME TO FAILURE (days): Did not fail.

FAILURE MECHANISM: -

BREACH DIMENSIONS: -

CONTROLS: ?

DAM MATERIALS: Boulders, birch trees, and earth.

REFERENCES: Rapp, 1963.

COMMENTS: Preexisting lake raised 2-3 m by landslide dam. Lake still intact in 1962 when Rapp did field work.

07/15/91

COUNTRY: Norway

SUBDIVISION: Vaerdalen

DATE: 1863

RIVER OR LAKE: Vaerdalselven River

TYPE OF LANDSLIDE: Spread, lateral

TRIGGER: ?

LANDSLIDE VOLUME (m^3): ?

DAM TYPE: ?

DAM HEIGHT (m): ?

DAM LENGTH (m): ?

DAM WIDTH (m): ?

LAKE LENGTH (m): ?

LAKE VOLUME (m^3): ?

TIME TO FAILURE (days): 0.03

FAILURE MECHANISM: ?

BREACH DIMENSIONS: ?

CONTROLS: ?

DAM MATERIALS: Clay.

REFERENCES: Holmsen, 1952-53.

COMMENTS: -

07/15/91

COUNTRY: Norway

SUBDIVISION: Vaerdalen

DATE: 1893; 5/19

RIVER OR LAKE: Vaerdalselven River

TYPE OF LANDSLIDE: Spread, lateral

TRIGGER: ?

LANDSLIDE VOLUME (m^3): 55,000,000

DAM TYPE: III

DAM HEIGHT (m): ?

DAM LENGTH (m): 7,000

DAM WIDTH (m): 1,200

LAKE LENGTH (m): 5,000

LAKE VOLUME (m^3): ?

TIME TO FAILURE (days): ?

FAILURE MECHANISM: ?

BREACH DIMENSIONS: ?

CONTROLS: ?

DAM MATERIALS: Stratified soft clay overlain by 15 m of sand.

REFERENCES: Holmsen, 1952-53.

COMMENTS: Flooded upstream farms. Area of lake 3.2 sq km; 22 farms lost, 111 killed. Good map of slide; plan view.

07/15/91

COUNTRY: Pakistan

SUBDIVISION: Kashmir

DATE: 1984; 7/21

RIVER OR LAKE: Gilgit River

TYPE OF LANDSLIDE: Flow, debris

TRIGGER: Rainfall

LANDSLIDE VOLUME (m^3): ?

DAM TYPE: ?

DAM HEIGHT (m): ?

DAM LENGTH (m): ?

DAM WIDTH (m): ?

LAKE LENGTH (m): ?

LAKE VOLUME (m^3): ?

TIME TO FAILURE (days): 0.1

FAILURE MECHANISM: ?

BREACH DIMENSIONS: ?

CONTROLS: -

DAM MATERIALS: ?

REFERENCES: Shroder, 1989.

COMMENTS: Debris flow from tributary blocked the Gilgit River.

07/15/91

COUNTRY: Pakistan

SUBDIVISION: Kashmir

DATE: 1840; 12/?

RIVER OR LAKE: Indus River

TYPE OF LANDSLIDE: Slide, rock /avalanche, debris

TRIGGER: Earthquake

LANDSLIDE VOLUME (m^3): ?

DAM TYPE: ?

DAM HEIGHT (m): 224

DAM LENGTH (m): 1,600

DAM WIDTH (m): ?

LAKE LENGTH (m): 64,000

LAKE VOLUME (m^3): ?

TIME TO FAILURE (days): 150

FAILURE MECHANISM: Overtopping; 2nd landslide into lake.

BREACH DIMENSIONS: ?

CONTROLS: -

DAM MATERIALS: Rock and soil debris.

REFERENCES: Mason, 1929; Code and Sirhindi, 1986; Butler and others, 1988.

COMMENTS: Failure occurred when 2nd landslide fell into lake, causing dam to be overtopped.

07/15/91

COUNTRY: Pakistan

SUBDIVISION: Kashmir, Gilgit, near Gupis

DATE: 1980; 7/27

RIVER OR LAKE: Ghizar River

TYPE OF LANDSLIDE: Flow, debris

TRIGGER: Dam failure

LANDSLIDE VOLUME (m^3): ?

DAM TYPE: III

DAM HEIGHT (m): 30

DAM LENGTH (m): ?

DAM WIDTH (m): 250

LAKE LENGTH (m): 5,000

LAKE VOLUME (m^3): ?

TIME TO FAILURE (days): 1.3 (did not fail)

FAILURE MECHANISM: Overtopping

BREACH DIMENSIONS: ?

CONTROLS: ?

DAM MATERIALS: Boulders, cobbles, and gravel in silty sand matrix.

REFERENCES: Nash and others, 1985; Hughes and Nash, 1986.

COMMENTS: Caused by upstream ice-dam failure. Flooded two upstream villages; displaced 500 people. No real failure because of particle-size distribution, high pore pressures.

07/15/91

COUNTRY: Pakistan

SUBDIVISION: Kashmir, Hunza

DATE: 1976

RIVER OR LAKE: Hunza River

TYPE OF LANDSLIDE: Flow, debris

TRIGGER: ?

LANDSLIDE VOLUME (m^3): ?

DAM TYPE: ?

DAM HEIGHT (m): 20

DAM LENGTH (m): ?

DAM WIDTH (m): ?

LAKE LENGTH (m): 12,000

LAKE VOLUME (m^3): ?

TIME TO FAILURE (days): Did not fail.

FAILURE MECHANISM: -

BREACH DIMENSIONS: -

CONTROLS: Several attempts to breach dam; did not fail.

DAM MATERIALS: ?

REFERENCES: Brunsden and Jones, 1984; Goudie and others, 1984; Nash and others, 1985.

COMMENTS: Friendship bridge flooded.

07/15/91

COUNTRY: Pakistan

SUBDIVISION: Kashmir, Hunza, Batura

DATE: 1974; 8/14

RIVER OR LAKE: Hunza River

TYPE OF LANDSLIDE: Flow, debris

TRIGGER: Rainfall

LANDSLIDE VOLUME (m^3): ?

DAM TYPE: ?

DAM HEIGHT (m): 4

DAM LENGTH (m): 40

DAM WIDTH (m): ?

LAKE LENGTH (m): ?

LAKE VOLUME (m^3): ?

TIME TO FAILURE (days): 0.04

FAILURE MECHANISM: ?

BREACH DIMENSIONS: ?

CONTROLS: -

DAM MATERIALS: ?

REFERENCES: Batura Investigation Group, 1976; Goudie and others, 1984.

COMMENTS: 10.3 mm rain in 2 days; upstream flooding flooded bridge across Hunza River.

07/15/91

COUNTRY: Pakistan

SUBDIVISION: Kashmir, Hunza, near Sarat

DATE: 1858

RIVER OR LAKE: Hunza River

TYPE OF LANDSLIDE: Slide, rock

TRIGGER: Rainfall and snowmelt

LANDSLIDE VOLUME (m^3): ?

DAM TYPE: ?

DAM HEIGHT (m): 100 (?)

DAM LENGTH (m): ?

DAM WIDTH (m): ?

LAKE LENGTH (m): 45,000

LAKE VOLUME (m^3): ?

TIME TO FAILURE (days): 180

FAILURE MECHANISM: Overtopping

BREACH DIMENSIONS: ?

CONTROLS: -

DAM MATERIALS: ?

REFERENCES: Belcher, 1859; Goudie and others, 1984.

COMMENTS: Caused major flood.

07/15/91

COUNTRY: Pakistan

SUBDIVISION: Kashmir, near Gilgit

DATE: 1981

RIVER OR LAKE: Gilgit River

TYPE OF LANDSLIDE: Flow, debris

TRIGGER: ?

LANDSLIDE VOLUME (m^3): ?

DAM TYPE: ?

DAM HEIGHT (m): 5

DAM LENGTH (m): 500

DAM WIDTH (m): ?

LAKE LENGTH (m): ?

LAKE VOLUME (m^3): ?

TIME TO FAILURE (days): ?

FAILURE MECHANISM: ?

BREACH DIMENSIONS: ?

CONTROLS: Lake was drained.

DAM MATERIALS: ?

REFERENCES: Goudie and others, 1984; Nash and others, 1985.

COMMENTS: -

07/15/91

COUNTRY: Papua New Guinea

SUBDIVISION: East New Britain Province

DATE: 1985; 5/11

RIVER OR LAKE: Bairaman River

TYPE OF LANDSLIDE: Slide, rock /avalanche, debris

TRIGGER: Earthquake

LANDSLIDE VOLUME (m^3): 200,000,000

DAM TYPE: III

DAM HEIGHT (m): 200

DAM LENGTH (m): 1,000

DAM WIDTH (m): 3,000

LAKE LENGTH (m): 3,000

LAKE VOLUME (m^3): 50,000,000

TIME TO FAILURE (days): 489

FAILURE MECHANISM: Overtopping

BREACH DIMENSIONS: 2 hours to full breach (R. L. Schuster, eye witness)

CONTROLS: Blasting of low point lowered dam 1-2 m.

DAM MATERIALS: Shale, limestone, 3 m max size, penetration N = 0.9-4 in top 0.5-0.7m.

REFERENCES: King, 1986; King, 1987; King and others. 1989.

COMMENTS: Low permeability, no seepage, high silt (22-37 %).
Drainage area = 100 sq km. 100-m-deep flood due to failure.

07/15/91

COUNTRY: Papua New Guinea

SUBDIVISION: East New Britain Province

DATE: 1985; 5/11

RIVER OR LAKE: Bairaman River, (NE headwaters)

TYPE OF LANDSLIDE: Slide, rock /avalanche, debris

TRIGGER: Earthquake

LANDSLIDE VOLUME (m^3): 150,000,000

DAM TYPE: III

DAM HEIGHT (m): 50

DAM LENGTH (m): 500

DAM WIDTH (m): 1,000

LAKE LENGTH (m): 3,500

LAKE VOLUME (m^3): 2,100,000

TIME TO FAILURE (days): Did not fail.

FAILURE MECHANISM: -

BREACH DIMENSIONS: -

CONTROLS: Lake may be draining by seepage through dam or limestone walls.

DAM MATERIALS: ?

REFERENCES: King and Loveday, 1985.

COMMENTS: -

07/15/91

COUNTRY: Papua New Guinea

SUBDIVISION: East New Britain Province, Gazelle Peninsula

DATE: 1941; 1/14

RIVER OR LAKE: Undal River

TYPE OF LANDSLIDE: ?

TRIGGER: Earthquake

LANDSLIDE VOLUME (m^3): ?

DAM TYPE: ?

DAM HEIGHT (m): 11

DAM LENGTH (m): 137

DAM WIDTH (m): 411

LAKE LENGTH (m): ?

LAKE VOLUME (m^3): ?

TIME TO FAILURE (days): ?

FAILURE MECHANISM: ?

BREACH DIMENSIONS: ?

CONTROLS: ?

DAM MATERIALS: Conglomerate, shales, sandstones.

REFERENCES: Fisher, 1944.

COMMENTS: -

07/15/91

COUNTRY: Papua New Guinea

SUBDIVISION: East Sepik Province, near Maprik

DATE: 1935; 9/20

RIVER OR LAKE: Clearwater Creek; Lake Imbia

TYPE OF LANDSLIDE: Slide, rock and earth

TRIGGER: Earthquake

LANDSLIDE VOLUME (m^3): 2,000,000

DAM TYPE: III

DAM HEIGHT (m): 45

DAM LENGTH (m): 100

DAM WIDTH (m): 200

LAKE LENGTH (m): 500

LAKE VOLUME (m^3): 1,000,000

TIME TO FAILURE (days): Did not fail.

FAILURE MECHANISM: -

BREACH DIMENSIONS: -

CONTROLS: Natural spillway eroded into in situ material on valley side.

DAM MATERIALS: Conglomerate and silty sandstone.

REFERENCES: Stanley, 1935; King, 1984.

COMMENTS: Lake-level dropped ca. 10 m into present channel.

07/15/91

COUNTRY: Papua New Guinea

SUBDIVISION: West New Britain Province

DATE: 1985; 5/11

RIVER OR LAKE: Tiaru River, (E headwaters)

TYPE OF LANDSLIDE: Flow, debris

TRIGGER: Earthquake

LANDSLIDE VOLUME (m^3): 600,000

DAM TYPE: ?

DAM HEIGHT (m): 30

DAM LENGTH (m): 100

DAM WIDTH (m): 300

LAKE LENGTH (m): 700

LAKE VOLUME (m^3): 280,000

TIME TO FAILURE (days): 19

FAILURE MECHANISM: ?

BREACH DIMENSIONS: ?

CONTROLS: -

DAM MATERIALS: ?

REFERENCES: King and Loveday, 1985.

COMMENTS: Site of previous landslide-dammed lake.

07/15/91

COUNTRY: Papua New Guinea

SUBDIVISION: West New Britain Province

DATE: 1985; 5/11

RIVER OR LAKE: Tiaru River, (W headwaters)

TYPE OF LANDSLIDE: Slide, rock and debris

TRIGGER: Earthquake

LANDSLIDE VOLUME (m^3): 5,000,000

DAM TYPE: ?

DAM HEIGHT (m): 50

DAM LENGTH (m): 200

DAM WIDTH (m): 500

LAKE LENGTH (m): 1,000

LAKE VOLUME (m^3): 2,000,000

TIME TO FAILURE (days): Did not fail.

FAILURE MECHANISM: -

BREACH DIMENSIONS: -

CONTROLS: Lake drainage by seepage.

DAM MATERIALS: ?

REFERENCES: King and Loveday, 1985.

COMMENTS: -

07/15/91

COUNTRY: Papua New Guinea

SUBDIVISION: Western Province, Ok Tedi Mine

DATE: 1984; 1/7

RIVER OR LAKE: Ok Ma River

TYPE OF LANDSLIDE: Slide, clay-slate translational

TRIGGER: Human-caused (construction)

LANDSLIDE VOLUME (m^3): 15,000,000

DAM TYPE: ?

DAM HEIGHT (m): 3

DAM LENGTH (m): 100

DAM WIDTH (m): 300

LAKE LENGTH (m): 800

LAKE VOLUME (m^3): 100,000

TIME TO FAILURE (days): 731

FAILURE MECHANISM: ?

BREACH DIMENSIONS: ?

CONTROLS: -

DAM MATERIALS: Clay-slate colluvium.

REFERENCES: Anderson and King, 1984.

COMMENTS: Landslide caused by excavation of toe of colluvial slope during dam construction.

07/15/91

COUNTRY: Peru

SUBDIVISION: Ancash Department

DATE: 1970; 5/31

RIVER OR LAKE: Nepena River

TYPE OF LANDSLIDE: Slide, rock

TRIGGER: Earthquake

LANDSLIDE VOLUME (m^3): ?

DAM TYPE: ?

DAM HEIGHT (m): 20

DAM LENGTH (m): ?

DAM WIDTH (m): ?

LAKE LENGTH (m): 480 (138 m wide)

LAKE VOLUME (m^3): ?

TIME TO FAILURE (days): Did not fail.

FAILURE MECHANISM: -

BREACH DIMENSIONS: -

CONTROLS: Lined spillway constructed across dam.

DAM MATERIALS: Fractured and altered granodiorite blocks.

REFERENCES: Plafker and others, 1971.

COMMENTS: Landslide length = 600 m; width = 300 m; average depth of lake is 20 m.

07/15/91

COUNTRY: Peru

SUBDIVISION: Ancash Department

DATE: 1970; 5/31

RIVER OR LAKE: Shacsha River; Upper Llanganuco Lake

TYPE OF LANDSLIDE: Fall, rock /avalanche, debris

TRIGGER: Earthquake

LANDSLIDE VOLUME (m^3): 500,000

DAM TYPE: II

DAM HEIGHT (m): ?

DAM LENGTH (m): ?

DAM WIDTH (m): ?

LAKE LENGTH (m): ?

LAKE VOLUME (m^3): ?

TIME TO FAILURE (days): Did not fail.

FAILURE MECHANISM: -

BREACH DIMENSIONS: -

CONTROLS: Trench dug within 1 mo to lower lake to pre-quake level.

DAM MATERIALS: ?

REFERENCES: Ericksen and others, 1970, 1989; Plafker and others, 1971.

COMMENTS: Caused level of upper lake to rise 7-8 m in 1 mo; landslide killed 15 Czechoslovakian hikers camped between lakes.

07/15/91

COUNTRY: Peru

SUBDIVISION: Ancash Department

DATE: 1946; 11/10

RIVER OR LAKE: Pelagatos River

TYPE OF LANDSLIDE: Avalanche, rock

TRIGGER: Earthquake

LANDSLIDE VOLUME (m^3): 25,000,000

DAM TYPE: ?

DAM HEIGHT (m): ?

DAM LENGTH (m): ?

DAM WIDTH (m): ?

LAKE LENGTH (m): ?

LAKE VOLUME (m^3): ?

TIME TO FAILURE (days): ?

FAILURE MECHANISM: ?

BREACH DIMENSIONS: ?

CONTROLS: -

DAM MATERIALS: Broken up granite.

REFERENCES: Heim, 1949; Silgado E., 1951.

COMMENTS: Formed two small lakes.

07/15/91

COUNTRY: Peru

SUBDIVISION: Ancash Department

DATE: 1946; 11/10

RIVER OR LAKE: Maranon River

TYPE OF LANDSLIDE: ?

TRIGGER: Earthquake

LANDSLIDE VOLUME (m^3): ?

DAM TYPE: ?

DAM HEIGHT (m): ?

DAM LENGTH (m): ?

DAM WIDTH (m): ?

LAKE LENGTH (m): ?

LAKE VOLUME (m^3): ?

TIME TO FAILURE (days): 41 (failed 12/21/46)

FAILURE MECHANISM: ?

BREACH DIMENSIONS: ?

CONTROLS: -

DAM MATERIALS: "Red beds"

REFERENCES: Heim, 1949.

COMMENTS: Small landslide in red beds dammed river, inundating large part of Hacienda Purhuay.

07/15/91

COUNTRY: Peru

SUBDIVISION: Ancash Department, Huaraz

DATE: 1941; 12/?

RIVER OR LAKE: Santa River

TYPE OF LANDSLIDE: Flow, debris

TRIGGER: Dam failure

LANDSLIDE VOLUME (m^3): 10,000,000

DAM TYPE: ?

DAM HEIGHT (m): ?

DAM LENGTH (m): ?

DAM WIDTH (m): ?

LAKE LENGTH (m): ?

LAKE VOLUME (m^3): ?

TIME TO FAILURE (days): 2

FAILURE MECHANISM: ?

BREACH DIMENSIONS: ?

CONTROLS: -

DAM MATERIALS: Debris-flow materials and boulders up to 700 tons each.

REFERENCES: Bodenlos and Ericksen, 1955; Ericksen and others, 1989.

COMMENTS: Temporary dam of Santa River caused by debris flow from moraine-dam failure on the tributary Cohup Valley. 4,000-6,000 people in Huaraz killed by original flow.

07/15/91

COUNTRY: Peru

SUBDIVISION: Ancash Department, Recuay

DATE: 1970; 5/31

RIVER OR LAKE: Santa River

TYPE OF LANDSLIDE: Slump

TRIGGER: Earthquake

LANDSLIDE VOLUME (m^3): 25,000,000

DAM TYPE: VI

DAM HEIGHT (m): ?

DAM LENGTH (m): 150

DAM WIDTH (m): 300

LAKE LENGTH (m): 700 (200 m wide)

LAKE VOLUME (m^3): ?

TIME TO FAILURE (days): Did not fail.

FAILURE MECHANISM: -

BREACH DIMENSIONS: -

CONTROLS: Two trenches 6-m long dug across dam to lower lake 2.5 m.

DAM MATERIALS: Fluvio-glacial sediments.

REFERENCES: Ericksen and others, 1970, 1989; Plafker and others, 1971.

COMMENTS: -

07/15/91

COUNTRY: Peru

SUBDIVISION: Ancash Department, Yungay

DATE: 1962; 1/10

RIVER OR LAKE: Santa River

TYPE OF LANDSLIDE: Avalanche, debris and ice

TRIGGER: Collapse of overhanging glacier; warm rainy season

LANDSLIDE VOLUME (m^3): 13,000,000 (20-25 % ice)

DAM TYPE: II

DAM HEIGHT (m): ?

DAM LENGTH (m): 300

DAM WIDTH (m): 1,300

LAKE LENGTH (m): ?

LAKE VOLUME (m^3): ?

TIME TO FAILURE (days): 0.002

FAILURE MECHANISM: ?

BREACH DIMENSIONS: ?

CONTROLS: -

DAM MATERIALS: 1/3 boulders and gravel; 2/3 < sand; some blocks of 15 m.

REFERENCES: Morales, 1966.

COMMENTS: Flow in Santa River 121 cu m/s before dam; 3,000 cu m/s after flood.

07/15/91

COUNTRY: Peru

SUBDIVISION: Ancash Department, Yungay

DATE: 1970; 5/31

RIVER OR LAKE: Santa River

TYPE OF LANDSLIDE: Avalanche, debris

TRIGGER: Earthquake

LANDSLIDE VOLUME (m^3): 50,000,000 - 100,000,000

DAM TYPE: III

DAM HEIGHT (m): ?

DAM LENGTH (m): 300

DAM WIDTH (m): 3,500

LAKE LENGTH (m): 1,000 - 2,000

LAKE VOLUME (m^3): ?

TIME TO FAILURE (days): 0.02

FAILURE MECHANISM: ?

BREACH DIMENSIONS: ?

CONTROLS: -

DAM MATERIALS: Gravelly mud; saturated. Liquid limit = 16%; Not plastic.

REFERENCES: Ericksen and others, 1970, 1989; Plafker and others, 1971.

COMMENTS: Flow in Santa River was from dam failure, not debris flow from mountain as reported. Ericksen and others report river dry for 1 hr after earthquake.

07/15/91

COUNTRY: Peru

SUBDIVISION: Ayacucho Department, Cerro Condor-Sencca

DATE: 1945; 8/16

RIVER OR LAKE: Mantaro River

TYPE OF LANDSLIDE: Slide, rock

TRIGGER: Undercutting

LANDSLIDE VOLUME (m^3): 3,500,000

DAM TYPE: II

DAM HEIGHT (m): 133

DAM LENGTH (m): 250

DAM WIDTH (m): 580

LAKE LENGTH (m): 21,000

LAKE VOLUME (m^3): 301,000,000

TIME TO FAILURE (days): 73

FAILURE MECHANISM: Piping and seepage.

BREACH DIMENSIONS: (Available in Snow, 1964).

CONTROLS: None. Evidence of dam is large lag rx, terraces, lake beds.

DAM MATERIALS: Fractured & weathered granodiorite blocks and much sand; some >6m.

REFERENCES: Snow, 1964.

COMMENTS: Upstream face (2.8:1); downstream (1.4:1); seepage reached 100 cu m/s, Qmax= 35,400 cu m/s; 50 times max annual flood; vel = 4.3 m/s.

07/15/91

COUNTRY: Peru

SUBDIVISION: Huancavelica Department, Acobamba

DATE: ?

RIVER OR LAKE: Huancapara River; Lake Azulcocha

TYPE OF LANDSLIDE: ?

TRIGGER: ?

LANDSLIDE VOLUME (m^3): ?

DAM TYPE: ?

DAM HEIGHT (m): 20

DAM LENGTH (m): 500

DAM WIDTH (m): 200

LAKE LENGTH (m): 750 (220 m wide)

LAKE VOLUME (m^3): ?

TIME TO FAILURE (days): ? (failed 3/21/67)

FAILURE MECHANISM: Overtopping

BREACH DIMENSIONS: ?

CONTROLS: -

DAM MATERIALS: Sandstone, limestone, volcanics.

REFERENCES: Garcia Marquez, 1973.

COMMENTS: Lake drained by seepage through dam; heavy rain filled to overflowing, breached. Dam surface cultivated.

07/15/91

COUNTRY: Peru

SUBDIVISION: Huancavelica Department, Mayunmarca

DATE: 1974; 4/25

RIVER OR LAKE: Mantaro River

TYPE OF LANDSLIDE: Avalanche, debris

TRIGGER: Rainfall ?; downcutting of river ?

LANDSLIDE VOLUME (m^3): 1,600,000,000

DAM TYPE: III

DAM HEIGHT (m): 160

DAM LENGTH (m): 1,000

DAM WIDTH (m): 3,800

LAKE LENGTH (m): 31,000 (200-300 m wide)

LAKE VOLUME (m^3): 670,000,000

TIME TO FAILURE (days): 42

FAILURE MECHANISM: Overtopping

BREACH DIMENSIONS: Eroded breach 107 m deep.

CONTROLS: -

DAM MATERIALS: Well-graded mix of clay, silt, sand, gravel, boulders. See references.

REFERENCES: Hutchinson and Kojan, 1974; Lee and Duncan, 1975.

COMMENTS: No seepage for 45 days. Geotechnical data in references. Overtopped for 2 days with very low discharge before erosion began. Dam much finer-grained than bedload. Four hours to maximum discharge. Serious erosion began 12:00 noon; maximum discharge reached at 4:00 PM. 25 percent of lake remained.

07/15/91

COUNTRY: Peru

SUBDIVISION: Huancavelica Department, Tablachaca

DATE: 1930

RIVER OR LAKE: Mantaro River

TYPE OF LANDSLIDE: Avalanche, debris

TRIGGER: ?

LANDSLIDE VOLUME (m^3): ?

DAM TYPE: II

DAM HEIGHT (m): ?

DAM LENGTH (m): 300

DAM WIDTH (m): 450

LAKE LENGTH (m): ?

LAKE VOLUME (m^3): ?

TIME TO FAILURE (days): 60

FAILURE MECHANISM: ?

BREACH DIMENSIONS: ?

CONTROLS: -

DAM MATERIALS: ?

REFERENCES: Lee and Duncan, 1975.

COMMENTS: -

07/15/91

COUNTRY: Peru

SUBDIVISION: Huancavelica Department, near Acobamba

DATE: 1967; 3/21

RIVER OR LAKE: Tincog River

TYPE OF LANDSLIDE: ?

TRIGGER: Rainfall

LANDSLIDE VOLUME (m^3): ?

DAM TYPE: ?

DAM HEIGHT (m): ?

DAM LENGTH (m): ?

DAM WIDTH (m): ?

LAKE LENGTH (m): ?

LAKE VOLUME (m^3): ?

TIME TO FAILURE (days): ?

FAILURE MECHANISM: ?

BREACH DIMENSIONS: ?

CONTROLS: ?

DAM MATERIALS: ?

REFERENCES: Garcia Marquez, 1973.

COMMENTS: Dam failed and caused mudflow; same storm led to failure of Lake Azulcocha (prehistoric ? landslide dam lake) on Huancapan River; caused flooding.

07/15/91

COUNTRY: Peru

SUBDIVISION: Loreto Department

DATE: 1968; 6/?

RIVER OR LAKE: Yuracyacu River

TYPE OF LANDSLIDE: Slide, rock

TRIGGER: ?

LANDSLIDE VOLUME (m^3): 300,000

DAM TYPE: ?

DAM HEIGHT (m): ?

DAM LENGTH (m): ?

DAM WIDTH (m): ?

LAKE LENGTH (m): ?

LAKE VOLUME (m^3): ? ("small lake")

TIME TO FAILURE (days): ?

FAILURE MECHANISM: ?

BREACH DIMENSIONS: ?

CONTROLS: ?

DAM MATERIALS: Marl.

REFERENCES: Rantucci, 1987.

COMMENTS: -

07/15/91

COUNTRY: Philippines

SUBDIVISION: Central Panay, 35 km W of Calinoq

DATE: 1938; 11/24

RIVER OR LAKE: Jalaur River

TYPE OF LANDSLIDE: Slump

TRIGGER: Rainfall

LANDSLIDE VOLUME (m^3): ?

DAM TYPE: ?

DAM HEIGHT (m): 55

DAM LENGTH (m): ?

DAM WIDTH (m): ?

LAKE LENGTH (m): 8,000 (1,000 m wide)

LAKE VOLUME (m^3): ?

TIME TO FAILURE (days): 33

FAILURE MECHANISM: ?

BREACH DIMENSIONS: ?

CONTROLS: ?

DAM MATERIALS: Tertiary sands and clays.

REFERENCES: Fryxell, 1941.

COMMENTS: -

07/15/91

COUNTRY: Philippines

SUBDIVISION: Luzon Island, Benguet Province, near Baguio

DATE: 1968; 11/?

RIVER OR LAKE: Bued River

TYPE OF LANDSLIDE: Flow, debris

TRIGGER: Rainfall

LANDSLIDE VOLUME (m^3): 1,000,000

DAM TYPE: ?

DAM HEIGHT (m): 10

DAM LENGTH (m): ?

DAM WIDTH (m): 300

LAKE LENGTH (m): ?

LAKE VOLUME (m^3): ?

TIME TO FAILURE (days): ?

FAILURE MECHANISM: ?

BREACH DIMENSIONS: ?

CONTROLS: -

DAM MATERIALS: Volcanic and sedimentary rock.

REFERENCES: Paderes and Contreras, 1969.

COMMENTS: Upstream exploration works of mining company were flooded by the lake.

07/15/91

COUNTRY: Philippines

SUBDIVISION: Luzon Island, Mount Iriga

DATE: 1628 (?)

RIVER OR LAKE: Naporoc River tributary; Lake Buhi

TYPE OF LANDSLIDE: Avalanche, debris

TRIGGER: ?

LANDSLIDE VOLUME (m^3): 1,500,000,000

DAM TYPE: III

DAM HEIGHT (m): 90 (?)

DAM LENGTH (m): ?

DAM WIDTH (m): ?

LAKE LENGTH (m): 5,000 (4,000 m wide)

LAKE VOLUME (m^3): ?

TIME TO FAILURE (days): Did not fail.

FAILURE MECHANISM: -

BREACH DIMENSIONS: -

CONTROLS: -

DAM MATERIALS: Volcanic debris.

REFERENCES: Aguila and others, 1986.

COMMENTS: Debris avalanche dammed a river and still retains a large lake despite the fact the lake drains over the blockage.

07/15/91

COUNTRY: Poland

SUBDIVISION: Carpathian Mountains, Bieszczady (near Soviet border)

DATE: 1980; 7/25

RIVER OR LAKE: Wetlina River; Srebrne (Silver) Lake

TYPE OF LANDSLIDE: Fall, rock /flow, debris

TRIGGER: Rainfall

LANDSLIDE VOLUME (m^3): 150,000

DAM TYPE: ?

DAM HEIGHT (m): 6 - 10

DAM LENGTH (m): 25 - 30

DAM WIDTH (m): 60

LAKE LENGTH (m): 200

LAKE VOLUME (m^3): ? (Max. depth = 5 m).

TIME TO FAILURE (days): 2,920

FAILURE MECHANISM: Overtopping

BREACH DIMENSIONS: breach width = 10-15 m; depth = 3-5 m.

CONTROLS: -

DAM MATERIALS: Shale and sandstone fragments.

REFERENCES: Dziuban, 1983; E. Gil, Szymbark, Poland, unpub. data, 1990.

COMMENTS: -

07/15/91

COUNTRY: Romania

SUBDIVISION: Carpathian Mountains, near Gheorgheni

DATE: 1828

RIVER OR LAKE: Lake Rosu

TYPE OF LANDSLIDE: Slide, rock

TRIGGER: ?

LANDSLIDE VOLUME (m^3): ?

DAM TYPE: ?

DAM HEIGHT (m): ?

DAM LENGTH (m): ?

DAM WIDTH (m): ?

LAKE LENGTH (m): ?

LAKE VOLUME (m^3): ?

TIME TO FAILURE (days): Did not fail.

FAILURE MECHANISM: -

BREACH DIMENSIONS: ?

CONTROLS: Probably erosion-resistant rock.

DAM MATERIALS: Limestone.

REFERENCES: Zaruba and Mencl, 1982.

COMMENTS: -

07/15/91

COUNTRY: Solomon Islands

SUBDIVISION: Guadalcanal, 22 km SW of Honiara

DATE: 1986; 5/23

RIVER OR LAKE: Mongga River tributary

TYPE OF LANDSLIDE: Avalanche, rock

TRIGGER: Rainfall

LANDSLIDE VOLUME (m^3): 5,000,000

DAM TYPE: III

DAM HEIGHT (m): 30

DAM LENGTH (m): 400

DAM WIDTH (m): 1,500

LAKE LENGTH (m): 3,000

LAKE VOLUME (m^3): 12,000,000

TIME TO FAILURE (days): 108

FAILURE MECHANISM: Overtopping

BREACH DIMENSIONS: -

CONTROLS: Artificial spillway built; washed out.

DAM MATERIALS: Massive blocks (250 t) to gravel, sand, silt. Wet and saturated.

REFERENCES: Booth, 1986.

COMMENTS: Lake is enlargement of previous landslide-dammed lake which formed in 1919; slow downcutting has destroyed spillway; downstream slope 3 degrees, locally 15 degrees.

07/15/91

COUNTRY: Spain

SUBDIVISION: Granada, Los Olivares

DATE: 1986; 4/?

RIVER OR LAKE: Velillos River

TYPE OF LANDSLIDE: Slump /flow, earth

TRIGGER: Human-caused (mining)

LANDSLIDE VOLUME (m^3): 500,000

DAM TYPE: II

DAM HEIGHT (m): 3

DAM LENGTH (m): 15

DAM WIDTH (m): 35

LAKE LENGTH (m): ?

LAKE VOLUME (m^3): ?

TIME TO FAILURE (days): Did not fail.

FAILURE MECHANISM: -

BREACH DIMENSIONS: -

CONTROLS: Culvert drain put under toe; spillway dug around toe of earthflow.

DAM MATERIALS: Shale and sandstone.

REFERENCES: Rodriguez and Duran, 1988.

COMMENTS: Interruption of surface drainage by dolomite quarry tailings caused ponding which triggered landslide.

07/15/91

COUNTRY: Sri Lanka

SUBDIVISION: Central Highlands, Matale

DATE: 1982; 12/9

RIVER OR LAKE: ?

TYPE OF LANDSLIDE: Slump/flow, debris

TRIGGER: Rainfall

LANDSLIDE VOLUME (m^3): ?

DAM TYPE: ?

DAM HEIGHT (m): ?

DAM LENGTH (m): ?

DAM WIDTH (m): ?

LAKE LENGTH (m): ?

LAKE VOLUME (m^3): ?

TIME TO FAILURE (days): < 1

FAILURE MECHANISM: ?

BREACH DIMENSIONS: ?

CONTROLS: ?

DAM MATERIALS: Gneiss and soil debris.

REFERENCES: Dahanayake, 1989.

COMMENTS: Landslide occurred along dip slope of gneiss. Dam failed, carrying with it large blocks of rock and soil debris, causing devastation of Pitakanda Estate and killing some of the people in rooms by burying them alive.

07/15/91

COUNTRY: Sweden

SUBDIVISION: near Goteborg

DATE: 1950; 9/29

RIVER OR LAKE: Gota Alv River

TYPE OF LANDSLIDE: Slide, earth

TRIGGER: Human-caused (shock waves from pile driving)

LANDSLIDE VOLUME (m^3): 3,000,000

DAM TYPE: VI

DAM HEIGHT (m): 5

DAM LENGTH (m): 110

DAM WIDTH (m): 110

LAKE LENGTH (m): ?

LAKE VOLUME (m^3): ?

TIME TO FAILURE (days): ?

FAILURE MECHANISM: ?

BREACH DIMENSIONS: ?

CONTROLS: ?

DAM MATERIALS: Sensitive marine clays.

REFERENCES: Caldenius and Lundstrom, 1955.

COMMENTS: Rotational uplift of riverbed by 5 m.

07/15/91

COUNTRY: Switzerland

SUBDIVISION: Berne Canton, Moutier-Court Gorge

DATE: 1937; 3/? - 4/?

RIVER OR LAKE: Birse River (upper dam)

TYPE OF LANDSLIDE: Slide, debris

TRIGGER: Rainfall

LANDSLIDE VOLUME (m^3): 2,000,000

DAM TYPE: V

DAM HEIGHT (m): 6

DAM LENGTH (m): 25

DAM WIDTH (m): 80

LAKE LENGTH (m): 60

LAKE VOLUME (m^3): ?

TIME TO FAILURE (days): Did not fail.

FAILURE MECHANISM: -

BREACH DIMENSIONS: -

CONTROLS: Blasting opened spillway.

DAM MATERIALS: Limestone, marl, and shale debris.

REFERENCES: Peter, 1938.

COMMENTS: Two lakes formed by single slide. This is the smaller lake.

07/15/91

COUNTRY: Switzerland

SUBDIVISION: Berne Canton, Moutier-Court Gorge

DATE: 1937; 3/? - 4/?

RIVER OR LAKE: Birse River (lower dam)

TYPE OF LANDSLIDE: Slide, debris

TRIGGER: Rainfall

LANDSLIDE VOLUME (m^3): 2,000,000

DAM TYPE: V

DAM HEIGHT (m): 9

DAM LENGTH (m): 30

DAM WIDTH (m): 110

LAKE LENGTH (m): 100

LAKE VOLUME (m^3): ?

TIME TO FAILURE (days): Did not fail.

FAILURE MECHANISM: -

BREACH DIMENSIONS: -

CONTROLS: Blasting opened spillway.

DAM MATERIALS: Limestone, marl, and shale debris.

REFERENCES: Peter, 1938.

COMMENTS: Two lakes formed by single slide. This is larger lake (Slide Lake).

07/15/91

COUNTRY: Switzerland

SUBDIVISION: Glarus Canton, Glarus

DATE: 1594; 7/3

RIVER OR LAKE: Linth River tributary

TYPE OF LANDSLIDE: Avalanche, rock

TRIGGER: Earthquake

LANDSLIDE VOLUME (m^3): ?

DAM TYPE: ?

DAM HEIGHT (m): ?

DAM LENGTH (m): ?

DAM WIDTH (m): ?

LAKE LENGTH (m): ?

LAKE VOLUME (m^3): ?

TIME TO FAILURE (days): 9

FAILURE MECHANISM: ?

BREACH DIMENSIONS: ?

CONTROLS: ?

DAM MATERIALS: ?

REFERENCES: Montandon, 1933.

COMMENTS: Flood caused much damage in city of Glarus.

07/15/91

COUNTRY: Switzerland

SUBDIVISION: Graubunden Canton, Disentis

DATE: 1683; 6/29

RIVER OR LAKE: Vorderrhein River

TYPE OF LANDSLIDE: Avalanche, rock

TRIGGER: ?

LANDSLIDE VOLUME (m^3): 10,000,000 - 20,000,000

DAM TYPE: ?

DAM HEIGHT (m): ?

DAM LENGTH (m): ?

DAM WIDTH (m): ?

LAKE LENGTH (m): ?

LAKE VOLUME (m^3): ?

TIME TO FAILURE (days): 0.1

FAILURE MECHANISM: Overtopping

BREACH DIMENSIONS: ?

CONTROLS: -

DAM MATERIALS: Gneiss debris.

REFERENCES: Heim, 1921; Montandon, 1933; Eisbacher and Clague, 1984, p. 131-132.

COMMENTS: Avalanche went across valley, "temporarily halted waters of the Vorderrhein River."

07/15/91

COUNTRY: Switzerland

SUBDIVISION: Graubunden Canton, Ober Engadin, Varuna Valley

DATE: 1987; 7/18

RIVER OR LAKE: Poschiavino River

TYPE OF LANDSLIDE: Flow, debris

TRIGGER: Rainfall

LANDSLIDE VOLUME (m^3): 350,000

DAM TYPE: ?

DAM HEIGHT (m): ?

DAM LENGTH (m): ?

DAM WIDTH (m): ?

LAKE LENGTH (m): ?

LAKE VOLUME (m^3): ?

TIME TO FAILURE (days): ?

FAILURE MECHANISM: ?

BREACH DIMENSIONS: ?

CONTROLS: -

DAM MATERIALS: Debris-flow materials.

REFERENCES: Naef and others, 1989.

COMMENTS: Damming of the Poschiavino River caused it to change its course and flow through the main village of the valley, where it caused severe damage.

07/15/91

COUNTRY: Switzerland

SUBDIVISION: Graubunden Canton, near Thusis

DATE: 1585; 8/15

RIVER OR LAKE: Rhine River

TYPE OF LANDSLIDE: Flow, debris

TRIGGER: Rainfall

LANDSLIDE VOLUME (m^3): ?

DAM TYPE: ?

DAM HEIGHT (m): ?

DAM LENGTH (m): ?

DAM WIDTH (m): ?

LAKE LENGTH (m): ?

LAKE VOLUME (m^3): ?

TIME TO FAILURE (days): ?

FAILURE MECHANISM: ?

BREACH DIMENSIONS: ?

CONTROLS: ?

DAM MATERIALS: ?

REFERENCES: Montandon, 1933.

COMMENTS: -

07/15/91

COUNTRY: Switzerland

SUBDIVISION: Graubunden Canton, near Thusis

DATE: 1868; 9/27-28

RIVER OR LAKE: Rhine River (upper)

TYPE OF LANDSLIDE: Flow, debris

TRIGGER: Rainfall

LANDSLIDE VOLUME (m^3): ?

DAM TYPE: ?

DAM HEIGHT (m): 10 - 12

DAM LENGTH (m): ?

DAM WIDTH (m): ?

LAKE LENGTH (m): ?

LAKE VOLUME (m^3): ?

TIME TO FAILURE (days): ?

FAILURE MECHANISM: ?

BREACH DIMENSIONS: ?

CONTROLS: ?

DAM MATERIALS: ?

REFERENCES: Montandon, 1933.

COMMENTS: This is repeat of earlier damming of Rhine at mouth of Nolla Torrent.

07/15/91

COUNTRY: Switzerland

SUBDIVISION: Graubunden Canton, near Thusis

DATE: 1807; 11/?

RIVER OR LAKE: Rhine River (upper)

TYPE OF LANDSLIDE: Flow, debris

TRIGGER: Rainfall

LANDSLIDE VOLUME (m^3): ?

DAM TYPE: ?

DAM HEIGHT (m): 12

DAM LENGTH (m): ?

DAM WIDTH (m): ?

LAKE LENGTH (m): ?

LAKE VOLUME (m^3): ?

TIME TO FAILURE (days): ?

FAILURE MECHANISM: ?

BREACH DIMENSIONS: ?

CONTROLS: ?

DAM MATERIALS: ?

REFERENCES: Montandon, 1933.

COMMENTS: Flood caused great damage in Domleschg Valley.
Debris flow from Nolla Torrent dammed Rhine River.
Other debris flows occurred 12 times between
1705-1870.

07/15/91

COUNTRY: Switzerland

SUBDIVISION: Ticino Canton, Val Blenio, Biasca

DATE: 1513; 9/30

RIVER OR LAKE: Brenno River

TYPE OF LANDSLIDE: Avalanche, rock

TRIGGER: Rainfall

LANDSLIDE VOLUME (m^3): 10,000,000 - 20,000,000

DAM TYPE: ?

DAM HEIGHT (m): 50

DAM LENGTH (m): ?

DAM WIDTH (m): ?

LAKE LENGTH (m): 5,000

LAKE VOLUME (m^3): 100,000,000

TIME TO FAILURE (days): 597

FAILURE MECHANISM: Overtopping

BREACH DIMENSIONS: ?

CONTROLS: -

DAM MATERIALS: Gneiss debris.

REFERENCES: Heim, 1932; Montandon, 1933; Eisbacher and Clague, 1984, p. 101-102.

COMMENTS: Rising water drowned hamlets of Malvaglia and Semione; flood from failure engulfed Biasca, formed large wave in Lake Maggiore; 600 killed.

07/15/91

COUNTRY: Switzerland

SUBDIVISION: Ticino Canton, Val Blenio, Biasca

DATE: 1868; 10/4

RIVER OR LAKE: Brenno River

TYPE OF LANDSLIDE: Flow, debris

TRIGGER: Rainfall

LANDSLIDE VOLUME (m^3): ?

DAM TYPE: ?

DAM HEIGHT (m): ?

DAM LENGTH (m): ?

DAM WIDTH (m): ?

LAKE LENGTH (m): ?

LAKE VOLUME (m^3): ?

TIME TO FAILURE (days): ?

FAILURE MECHANISM: ?

BREACH DIMENSIONS: ?

CONTROLS: -

DAM MATERIALS: ?

REFERENCES: Heim, 1932; Montandon, 1933, p. 311; Eisbacher and Clague, 1984, p. 101-102.

COMMENTS: Formed "huge lake"; overflowed without significant damage.

07/15/91

COUNTRY: Switzerland

SUBDIVISION: Ticino Canton, Val d'Arbedo, Bellizona

DATE: 1928; 10/2

RIVER OR LAKE: Traversagna Torrent

TYPE OF LANDSLIDE: Slide, rock /avalanche, rock

TRIGGER: Rainfall

LANDSLIDE VOLUME (m^3): 30,000,000 - 40,000,000

DAM TYPE: ?

DAM HEIGHT (m): ?

DAM LENGTH (m): ?

DAM WIDTH (m): 1,500

LAKE LENGTH (m): ?

LAKE VOLUME (m^3): ?

TIME TO FAILURE (days): ?

FAILURE MECHANISM: ?

BREACH DIMENSIONS: ?

CONTROLS: -

DAM MATERIALS: Gneiss and marble debris.

REFERENCES: Montandon, 1933, p. 329; Eisbacher and Clague, 1984, p. 200-201.

COMMENTS: 4 weeks later rainstorms saturated frontal parts of debris dam, triggering debris flows which engulfed buildings in Arbedo and Molinazzo.

07/15/91

COUNTRY: Switzerland

SUBDIVISION: Unterwalden Canton, Sarnen Valley, Schlierengrat

DATE: 1565 (?)

RIVER OR LAKE: Grosse Schliere Torrent

TYPE OF LANDSLIDE: Slide, rock

TRIGGER: ?

LANDSLIDE VOLUME (m^3): ?

DAM TYPE: ?

DAM HEIGHT (m): ?

DAM LENGTH (m): ?

DAM WIDTH (m): ?

LAKE LENGTH (m): ?

LAKE VOLUME (m^3): ?

TIME TO FAILURE (days): 350

FAILURE MECHANISM: ?

BREACH DIMENSIONS: ?

CONTROLS: -

DAM MATERIALS: Argillaceous sandstone debris.

REFERENCES: Montandon, 1933; Eisbacher and Clague, 1984, p. 107.

COMMENTS: Slide formed a new lake; lasted for "almost a year".

07/15/91

COUNTRY: Switzerland

SUBDIVISION: Unterwalden Canton, Sarnen Valley, Schlierengrat

DATE: 1910

RIVER OR LAKE: Grosse Schliere Torrent

TYPE OF LANDSLIDE: Slide, rock

TRIGGER: Rainfall and snowmelt ("wet spring")

LANDSLIDE VOLUME (m^3): ?

DAM TYPE: ?

DAM HEIGHT (m): ?

DAM LENGTH (m): ?

DAM WIDTH (m): ?

LAKE LENGTH (m): ?

LAKE VOLUME (m^3): ?

TIME TO FAILURE (days): ?

FAILURE MECHANISM: ?

BREACH DIMENSIONS: ?

CONTROLS: -

DAM MATERIALS: Sandstone slabs.

REFERENCES: Heim, 1932, p. 436-437; Eisbacher and Clague, 1984, p. 107.

COMMENTS: "Temporarly impounded torrent".

07/15/91

COUNTRY: Switzerland

SUBDIVISION: Uri Canton, Altdorf-Spiringen

DATE: 1887; 5/29

RIVER OR LAKE: Schachen Torrent

TYPE OF LANDSLIDE: Avalanche, debris

TRIGGER: Snowmelt

LANDSLIDE VOLUME (m^3): ?

DAM TYPE: ?

DAM HEIGHT (m): ?

DAM LENGTH (m): ?

DAM WIDTH (m): ?

LAKE LENGTH (m): ?

LAKE VOLUME (m^3): ?

TIME TO FAILURE (days): ? (brief spell)

FAILURE MECHANISM: ?

BREACH DIMENSIONS: ?

CONTROLS: -

DAM MATERIALS: Debris from slaty flysch.

REFERENCES: Heim, 1932, p. 68; Eisbacher and Clague, 1984, p. 185-186.

COMMENTS: Dammed torrent for a brief spell.

07/15/91

COUNTRY: Switzerland

SUBDIVISION: Valais Canton, Diablerets

DATE: 1749; 7/23

RIVER OR LAKE: Derborence Torrent; Lake of Derborence

TYPE OF LANDSLIDE: Avalanche, rock

TRIGGER: ?

LANDSLIDE VOLUME (m^3): 30,000,000

DAM TYPE: ?

DAM HEIGHT (m): ?

DAM LENGTH (m): ?

DAM WIDTH (m): ?

LAKE LENGTH (m): ?

LAKE VOLUME (m^3): ?

TIME TO FAILURE (days): Did not fail.

FAILURE MECHANISM: -

BREACH DIMENSIONS: -

CONTROLS: -

DAM MATERIALS: Slate and limestone.

REFERENCES: Heim, 1932, p. 130-133; Eisbacher and Clague, 1984, p. 133-134.

COMMENTS: Lake still exists.

07/15/91

COUNTRY: Switzerland

SUBDIVISION: Valais Canton, Rhone Valley, Illgraben

DATE: 1961; 3/26

RIVER OR LAKE: Illgraben Torrent

TYPE OF LANDSLIDE: Flow, debris

TRIGGER: ?

LANDSLIDE VOLUME (m^3): 3,500,000

DAM TYPE: ?

DAM HEIGHT (m): ?

DAM LENGTH (m): ?

DAM WIDTH (m): ?

LAKE LENGTH (m): ?

LAKE VOLUME (m^3): ?

TIME TO FAILURE (days): ?

FAILURE MECHANISM: Overtopping

BREACH DIMENSIONS: ?

CONTROLS: -

DAM MATERIALS: Evaporite and carbonate rock debris.

REFERENCES: Eisbacher and Clague, 1984, p. 211-212.

COMMENTS: By Jun 6, 1961, small lake formed behind debris.
Lake emptied rapidly.

07/15/91

COUNTRY: Switzerland

SUBDIVISION: Valais Canton, Val d'Anniviers, Mottec

DATE: 1200 - 1300

RIVER OR LAKE: Navisence Torrent

TYPE OF LANDSLIDE: Avalanche, rock

TRIGGER: ?

LANDSLIDE VOLUME (m^3): 2,000,000

DAM TYPE: ?

DAM HEIGHT (m): ?

DAM LENGTH (m): ?

DAM WIDTH (m): ?

LAKE LENGTH (m): 500

LAKE VOLUME (m^3): ?

TIME TO FAILURE (days): ?

FAILURE MECHANISM: ?

BREACH DIMENSIONS: ?

CONTROLS: -

DAM MATERIALS: Gneiss and schist debris.

REFERENCES: Montandon, 1933; Eisbacher and Clague, 1984, p. 84.

COMMENTS: -

07/15/91

COUNTRY: Switzerland

SUBDIVISION: Vaud Canton, Saint Maurice

DATE: 1636; 5/12

RIVER OR LAKE: Rhone River

TYPE OF LANDSLIDE: Flow, debris

TRIGGER: Rainfall and snowmelt

LANDSLIDE VOLUME (m^3): ?

DAM TYPE: ?

DAM HEIGHT (m): ?

DAM LENGTH (m): ?

DAM WIDTH (m): ?

LAKE LENGTH (m): ?

LAKE VOLUME (m^3): ?

TIME TO FAILURE (days): 0.02

FAILURE MECHANISM: Overtopping

BREACH DIMENSIONS: ?

CONTROLS: ?

DAM MATERIALS: Flysch grit.

REFERENCES: Montandon, 1933.

COMMENTS: A lake was formed upstream between the villages of Evionne and Collonges.

07/15/91

COUNTRY: Switzerland

SUBDIVISION: Vaud Canton, St. Maurice

DATE: 563

RIVER OR LAKE: Rhone River

TYPE OF LANDSLIDE: Flow, debris

TRIGGER: Rainfall and snowmelt

LANDSLIDE VOLUME (m^3): ?

DAM TYPE: ?

DAM HEIGHT (m): ?

DAM LENGTH (m): ?

DAM WIDTH (m): ?

LAKE LENGTH (m): ?

LAKE VOLUME (m^3): ?

TIME TO FAILURE (days): ?

FAILURE MECHANISM: ?

BREACH DIMENSIONS: ?

CONTROLS: -

DAM MATERIALS: ?

REFERENCES: Montandon, 1933, p. 280-281; Eisbacher and Clague, 1984, p. 170.

COMMENTS: River eventually broke through dam. Devastating flood wave raced downvalley to Lake Geneva killing many people.

07/15/91

COUNTRY: Switzerland

SUBDIVISION: Vaud Canton, St. Maurice

DATE: 1926; 9/20 - 10/9

RIVER OR LAKE: Rhone River

TYPE OF LANDSLIDE: Flow, debris

TRIGGER: Rainfall

LANDSLIDE VOLUME (m^3): 550,000 - 1,000,000

DAM TYPE: ?

DAM HEIGHT (m): ?

DAM LENGTH (m): ?

DAM WIDTH (m): ?

LAKE LENGTH (m): ?

LAKE VOLUME (m^3): ?

TIME TO FAILURE (days): ?

FAILURE MECHANISM: ?

BREACH DIMENSIONS: ?

CONTROLS: ?

DAM MATERIALS: Limestone.

REFERENCES: Montandon, 1933.

COMMENTS: -

07/15/91

COUNTRY: Taiwan

SUBDIVISION: Tsao-Ling

DATE: 1862; 6/6

RIVER OR LAKE: Chin-Shui-Chi River

TYPE OF LANDSLIDE: Slide, debris

TRIGGER: Earthquake

LANDSLIDE VOLUME (m^3): ?

DAM TYPE: II

DAM HEIGHT (m): ?

DAM LENGTH (m): ?

DAM WIDTH (m): ?

LAKE LENGTH (m): ?

LAKE VOLUME (m^3): ?

TIME TO FAILURE (days): 13,140

FAILURE MECHANISM: Overtopping

BREACH DIMENSIONS: ?

CONTROLS: ?

DAM MATERIALS: Pliocene bedded sandstone and shales.

REFERENCES: Chang, 1984; C. Fung, Taiwan Council for Economic Planning and Development, written commun., 1985.

COMMENTS: -

07/15/91

COUNTRY: Taiwan

SUBDIVISION: Tsao-Ling

DATE: 1942; 8/10

RIVER OR LAKE: Chin-Shui-Chi River

TYPE OF LANDSLIDE: Slide, debris

TRIGGER: Rainfall

LANDSLIDE VOLUME (m^3): ?

DAM TYPE: II

DAM HEIGHT (m): 217

DAM LENGTH (m): 1,100

DAM WIDTH (m): 1,600

LAKE LENGTH (m): 7,200

LAKE VOLUME (m^3): 157,000,000

TIME TO FAILURE (days): 3435

FAILURE MECHANISM: Overtopping

BREACH DIMENSIONS: ?

CONTROLS: ?

DAM MATERIALS: Pliocene sandstone and shale.

REFERENCES: Kawada, 1943; Chang, 1984; Fang, 1985.

COMMENTS: Lake area = 5.6 sq km; ave. width 770 m. 770 mm of rain in 3 days prior to landslide dam; 776 mm of rain in 3 days to cause overtopping. 154 people killed; 564 homes, 30 sq km of farmland lost.

07/15/91

COUNTRY: Taiwan

SUBDIVISION: Tsao-Ling

DATE: 1979; 8/15

RIVER OR LAKE: Chin-Shui-Chi River

TYPE OF LANDSLIDE: Slide, debris

TRIGGER: Rainfall

LANDSLIDE VOLUME (m^3): 5,000,000

DAM TYPE: II

DAM HEIGHT (m): 90

DAM LENGTH (m): ?

DAM WIDTH (m): ?

LAKE LENGTH (m): ?

LAKE VOLUME (m^3): 40,000,000

TIME TO FAILURE (days): 9

FAILURE MECHANISM: Overtopping

BREACH DIMENSIONS: ?

CONTROLS: ?

DAM MATERIALS: Pliocene sandstone and shale.

REFERENCES: Chang, 1984.

COMMENTS: Typhoon Judy; 624 mm rain in 2 days; some leakage before overtopping, no lake remains on map in Chang, 1984.

07/15/91

COUNTRY: Taiwan

SUBDIVISION: Tsao-Ling

DATE: 1941; 12/17

RIVER OR LAKE: Chin-Shui-Chi River

TYPE OF LANDSLIDE: Slide, debris

TRIGGER: Earthquake

LANDSLIDE VOLUME (m^3): 48,000,000

DAM TYPE: II

DAM HEIGHT (m): 140

DAM LENGTH (m): ?

DAM WIDTH (m): ?

LAKE LENGTH (m): ?

LAKE VOLUME (m^3): 12,800,000

TIME TO FAILURE (days): 3,669

FAILURE MECHANISM: Overtopping

BREACH DIMENSIONS: ?

CONTROLS: ?

DAM MATERIALS: Pliocene sandstone and shale.

REFERENCES: Kawada, 1943; Chang, 1984; Fang, 1985.

COMMENTS: First landslide to form dam in this location. Dam was raised and expanded by landslide in 1942.

07/15/91

COUNTRY: Thailand

SUBDIVISION: Nakhon Si Thammarat Province

DATE: 1988; 11/19-21

RIVER OR LAKE: Tha Di River

TYPE OF LANDSLIDE: Slide, rock

TRIGGER: Rainfall

LANDSLIDE VOLUME (m^3): ?

DAM TYPE: I

DAM HEIGHT (m): 6

DAM LENGTH (m): 80

DAM WIDTH (m): 25

LAKE LENGTH (m): ?

LAKE VOLUME (m^3): ?

TIME TO FAILURE (days): 4

FAILURE MECHANISM: Overtopping

BREACH DIMENSIONS: ?

CONTROLS: -

DAM MATERIALS: Granitic fragments with boulders up to 20 m diameter.

REFERENCES: DeGraff, 1989, 1990.

COMMENTS: Failure contributed to flooding of Ban Kiri Wong village.

07/15/91

COUNTRY: Thailand

SUBDIVISION: Nakhon Si Thammarat Province, 1 km from Ban Khiri Wong

DATE: 1988; 11/19-21

RIVER OR LAKE: Tha Di River

TYPE OF LANDSLIDE: Flow, debris

TRIGGER: Rainfall

LANDSLIDE VOLUME (m^3): ?

DAM TYPE: I

DAM HEIGHT (m): 3

DAM LENGTH (m): 40

DAM WIDTH (m): 5

LAKE LENGTH (m): ?

LAKE VOLUME (m^3): ?

TIME TO FAILURE (days): 2

FAILURE MECHANISM: Overtopping

BREACH DIMENSIONS: ?

CONTROLS: -

DAM MATERIALS: Sand with cobbles.

REFERENCES: DeGraff, 1989, 1990.

COMMENTS: Failure contributed to flooding of Ban Kiri Wong village.

07/15/91

COUNTRY: Thailand

SUBDIVISION: Surat Thani Province, near Ban Kathuan Nua Village

DATE: 1988; 11/19-23

RIVER OR LAKE: Haui Sao River

TYPE OF LANDSLIDE: Slide, rock

TRIGGER: Rainfall

LANDSLIDE VOLUME (m^3): ?

DAM TYPE: II

DAM HEIGHT (m): 12

DAM LENGTH (m): 50 - 100

DAM WIDTH (m): 35

LAKE LENGTH (m): ?

LAKE VOLUME (m^3): ?

TIME TO FAILURE (days): 1

FAILURE MECHANISM: Overtopping

BREACH DIMENSIONS: ?

CONTROLS: -

DAM MATERIALS: Broken granite bedrock.

REFERENCES: DeGraff, 1989, 1990.

COMMENTS: One of several landslide dams that formed on Haui Sao River during this storm. Failure of these dams contributed to flooding of Ban Kathuan Nua.

07/15/91

COUNTRY: Turkey

SUBDIVISION: Mount Ararat

DATE: 1840; 6/20

RIVER OR LAKE: Gorge from Cehennem-Dere Glacier

TYPE OF LANDSLIDE: Avalanche, rock and ice

TRIGGER: Earthquake

LANDSLIDE VOLUME (m^3): ?

DAM TYPE: ?

DAM HEIGHT (m): ?

DAM LENGTH (m): ?

DAM WIDTH (m): ?

LAKE LENGTH (m): ?

LAKE VOLUME (m^3): ?

TIME TO FAILURE (days): 3

FAILURE MECHANISM: ?

BREACH DIMENSIONS: ?

CONTROLS: -

DAM MATERIALS: ?

REFERENCES: Eisbacher and Clague, 1984, p. 40-41.

COMMENTS: -

07/15/91

COUNTRY: Turkey

SUBDIVISION: Trabzon Province, Catak

DATE: 1988; 6/23

RIVER OR LAKE: Degirmen River

TYPE OF LANDSLIDE: Avalanche, rock

TRIGGER: Rainfall

LANDSLIDE VOLUME (m^3): 250,000

DAM TYPE: ?

DAM HEIGHT (m): 6

DAM LENGTH (m): 50

DAM WIDTH (m): 130

LAKE LENGTH (m): 300

LAKE VOLUME (m^3): ?

TIME TO FAILURE (days): Did not fail.

FAILURE MECHANISM: -

BREACH DIMENSIONS: -

CONTROLS: Artificial channel constructed through debris.

DAM MATERIALS: Colluvial deposits, marls, mudstone, limestone, tuff, basalt.

REFERENCES: Jones and others, 1989a,b.

COMMENTS: Dam overtopped along western margin of cone, but did not fail. Lake waters drained on 29 June 1988 when artificial channel was excavated.

07/15/91

COUNTRY: U.S.S.R.

SUBDIVISION: Dagestan S.S.R., Achijisk landslide

DATE: 1970; 5/14

RIVER OR LAKE: Chavkhun-bak River

TYPE OF LANDSLIDE: Slide, rock

TRIGGER: Earthquake

LANDSLIDE VOLUME (m^3): 10,000,000

DAM TYPE: ?

DAM HEIGHT (m): ?

DAM LENGTH (m): ?

DAM WIDTH (m): ?

LAKE LENGTH (m): ?

LAKE VOLUME (m^3): ?

TIME TO FAILURE (days): ?

FAILURE MECHANISM: ?

BREACH DIMENSIONS: ?

CONTROLS: ?

DAM MATERIALS: Sedimentary rocks.

REFERENCES: Solonenko, 1977, 1979.

COMMENTS: -

07/15/91

COUNTRY: U.S.S.R.

SUBDIVISION: Georgian S.S.R., Adzhariya Region, near Tsablana

DATE: 1989; 4/19

RIVER OR LAKE: Charukha River

TYPE OF LANDSLIDE: ?

TRIGGER: ?

LANDSLIDE VOLUME (m^3): ?

DAM TYPE: ?

DAM HEIGHT (m): 90

DAM LENGTH (m): ?

DAM WIDTH (m): ?

LAKE LENGTH (m): ?

LAKE VOLUME (m^3): ?

TIME TO FAILURE (days): ?

FAILURE MECHANISM: ?

BREACH DIMENSIONS: ?

CONTROLS: -

DAM MATERIALS: ?

REFERENCES: Newman, 1989.

COMMENTS: Landslide dam caused the Charukha River to flow into Tsablana, where 30 villages may have been destroyed.

07/15/91

COUNTRY: U.S.S.R.

SUBDIVISION: Georgian S.S.R., Caucasus Mountains, near Amtkel

DATE: 1891

RIVER OR LAKE: Amtkel Lake

TYPE OF LANDSLIDE: ?

TRIGGER: Earthquake

LANDSLIDE VOLUME (m^3): ?

DAM TYPE: ?

DAM HEIGHT (m): 200

DAM LENGTH (m): ?

DAM WIDTH (m): ?

LAKE LENGTH (m): ?

LAKE VOLUME (m^3): ?

TIME TO FAILURE (days): ?

FAILURE MECHANISM: ?

BREACH DIMENSIONS: ?

CONTROLS: ?

DAM MATERIALS: ?

REFERENCES: Solonenko, 1979.

COMMENTS: Do not know if dam failed or not.

07/15/91

COUNTRY: U.S.S.R.

SUBDIVISION: Georgian S.S.R., near Ambrolauri (NE of Kutaisi)

DATE: 1972

RIVER OR LAKE: Ritseuli River, trib. of Rioni River

TYPE OF LANDSLIDE: ?

TRIGGER: ?

LANDSLIDE VOLUME (m^3): 30,000,000

DAM TYPE: ?

DAM HEIGHT (m): 20

DAM LENGTH (m): ?

DAM WIDTH (m): ?

LAKE LENGTH (m): ?

LAKE VOLUME (m^3): ?

TIME TO FAILURE (days): Did not fail.

FAILURE MECHANISM: -

BREACH DIMENSIONS: ?

CONTROLS: Artificially breached.

DAM MATERIALS: Clays of Oligocene and Miocene age.

REFERENCES: Chkeidze and others, 1979.

COMMENTS: This was the Kldisubani landslide which moved 80 m on "Substratum of ancient-landslide topography of Maikopian clay".

07/15/91

COUNTRY: U.S.S.R.

SUBDIVISION: Kazakh S.S.R., near Alma Alta

DATE: 1966-67

RIVER OR LAKE: Malaya Alma-Atinka River (Medeo Dam)

TYPE OF LANDSLIDE: ?

TRIGGER: Human-caused (explosions)

LANDSLIDE VOLUME (m^3): 2,500,000

DAM TYPE: II

DAM HEIGHT (m): 110

DAM LENGTH (m): ?

DAM WIDTH (m): ?

LAKE LENGTH (m): Filled with sediment.

LAKE VOLUME (m^3): 6,200,000

TIME TO FAILURE (days): Did not fail.

FAILURE MECHANISM: -

BREACH DIMENSIONS: -

CONTROLS: Dam built from artificially-triggered landslides.

DAM MATERIALS: ?

REFERENCES: Yesenov and Degovets, 1982.

COMMENTS: Two explosions used to construct this dam. First on right bank in Oct. 1966 formed 62-m high dam. Second explosion on left bank in April 1967 raised height to 110 m. Volume of landslide from first explosion was 1,700,000 cu m; second was 800,000 cu m. There is no lake. Dam build for sediment-retention, and was filled by debris flows in 1973 (5,500,000 cu m). Dam then raised to 150 m by conventional engineering measures.

07/15/91

COUNTRY: U.S.S.R.

SUBDIVISION: Kirghiz S.S.R., Chatkal River basin

DATE: 1946; 12/3

RIVER OR LAKE: Naryn River

TYPE OF LANDSLIDE: ?

TRIGGER: Earthquake

LANDSLIDE VOLUME (m^3): ?

DAM TYPE: ?

DAM HEIGHT (m): 50 - 60

DAM LENGTH (m): ?

DAM WIDTH (m): ?

LAKE LENGTH (m): ?

LAKE VOLUME (m^3): ?

TIME TO FAILURE (days): ?

FAILURE MECHANISM: ?

BREACH DIMENSIONS: ?

CONTROLS: ?

DAM MATERIALS: ?

REFERENCES: Solonenko, 1972.

COMMENTS: -

07/15/91

COUNTRY: U.S.S.R.

SUBDIVISION: Kirghiz S.S.R., Kichik-Alay Mountains

DATE: 1977; 7/17

RIVER OR LAKE: Isfayram River

TYPE OF LANDSLIDE: Flow, debris

TRIGGER: Rainfall and snowmelt

LANDSLIDE VOLUME (m^3): ?

DAM TYPE: ?

DAM HEIGHT (m): ?

DAM LENGTH (m): ?

DAM WIDTH (m): ?

LAKE LENGTH (m): ?

LAKE VOLUME (m^3): ?

TIME TO FAILURE (days): ?

FAILURE MECHANISM: Overtopping

BREACH DIMENSIONS: ?

CONTROLS: -

DAM MATERIALS: ?

REFERENCES: Pushkarenko and Nikitin, 1988.

COMMENTS: Emptying of the lake proceeded gradually.

07/15/91

COUNTRY: U.S.S.R.

SUBDIVISION: Kirghiz S.S.R., Kichik-Alay Mountains

DATE: 1835

RIVER OR LAKE: Tegermach River; Lake Yashilkul

TYPE OF LANDSLIDE: Fall, rock and debris

TRIGGER: Earthquake

LANDSLIDE VOLUME (m^3): 20,000,000

DAM TYPE: III

DAM HEIGHT (m): 120

DAM LENGTH (m): ?

DAM WIDTH (m): 60

LAKE LENGTH (m): ?

LAKE VOLUME (m^3): 6,600,000 (area = 36 sq km)

TIME TO FAILURE (days): 48,000 (130 yrs)

FAILURE MECHANISM: Piping

BREACH DIMENSIONS: W top = 280-340 m; W btm = 50-60 m; depth = 90 m.

CONTROLS: -

DAM MATERIALS: Crumbled shale rubble with soil.

REFERENCES: Glazyrin and Reyzvikh, 1968; Pushkarenko and Nikitin, 1988.

COMMENTS: Dam breached on June 18, 1966. Costs of damage in the downstream populated Fergana Valley expected to have been high.

07/15/91

COUNTRY: U.S.S.R.

SUBDIVISION: Kirrghiz S.S.R., Tien Shan Mountains.

DATE: 1989; 6/11

RIVER OR LAKE: Utch-Terek River, trib. of Naryn River

TYPE OF LANDSLIDE: ?

TRIGGER: Human-caused (explosions)

LANDSLIDE VOLUME (m^3): 3,000,000

DAM TYPE: II

DAM HEIGHT (m): 42

DAM LENGTH (m): ?

DAM WIDTH (m): ?

LAKE LENGTH (m): ?

LAKE VOLUME (m^3): ?

TIME TO FAILURE (days): Did not fail.

FAILURE MECHANISM: -

BREACH DIMENSIONS: -

CONTROLS: -

DAM MATERIALS: ?

REFERENCES: V.V. Adushkin, O. Yu Schmidt Institute of Earth Sciences, Moscow, personal commun., 1991.

COMMENTS: This dam is a pilot project for the much larger (260-m high) landslide dam to be formed on the Naryn River in 1997 as part of the Kambarata hydropower project.

07/15/91

COUNTRY: U.S.S.R.

SUBDIVISION: Tadzhik S.S.R.

DATE: 1964; 4/?

RIVER OR LAKE: Zeravshan River

TYPE OF LANDSLIDE: ?

TRIGGER: Earthquake

LANDSLIDE VOLUME (m^3): 15,000,000 - 20,000,000

DAM TYPE: ?

DAM HEIGHT (m): 200

DAM LENGTH (m): 400

DAM WIDTH (m): 1,800

LAKE LENGTH (m): ?

LAKE VOLUME (m^3): ?

TIME TO FAILURE (days): Did not fail.

FAILURE MECHANISM: -

BREACH DIMENSIONS: ?

CONTROLS: Spillway constructed by blasting and bulldozing.

DAM MATERIALS: Granite, earth and rock.

REFERENCES: Engineering News-Record, 1964; Washington Post, 1964.

COMMENTS: Apparently spillway construction successful and lake drained.

07/15/91

COUNTRY: U.S.S.R.

SUBDIVISION: Tadzhik S.S.R., Usoy

DATE: 1911; 2/18

RIVER OR LAKE: Murgab River; Lake Sarez

TYPE OF LANDSLIDE: Slide, rock

TRIGGER: Earthquake

LANDSLIDE VOLUME (m^3): 2,000,000,000

DAM TYPE: II

DAM HEIGHT (m): 800

DAM LENGTH (m): 1,000

DAM WIDTH (m): 1,000

LAKE LENGTH (m): 53,000

LAKE VOLUME (m^3): 16,000,000,000 (depth = 550 m)

TIME TO FAILURE (days): Did not fail.

FAILURE MECHANISM: -

BREACH DIMENSIONS: -

CONTROLS: -

DAM MATERIALS: Blocks of sandstone, shale, and carbonaceous rocks.

REFERENCES: Berg, 1950; Gasiev, 1984; Zolotarev and others, 1986; Pushkarenko and Nikitin, 1988.

COMMENTS: Highest dam in the world.

07/15/91

COUNTRY: U.S.S.R.

SUBDIVISION: Tadzhik S.S.R., near Khait

DATE: 1949; 7/10

RIVER OR LAKE: Yasman River

TYPE OF LANDSLIDE: Avalanche, debris

TRIGGER: Earthquake

LANDSLIDE VOLUME (m^3): ?

DAM TYPE: III

DAM HEIGHT (m): ?

DAM LENGTH (m): 1,500

DAM WIDTH (m): ?

LAKE LENGTH (m): ?

LAKE VOLUME (m^3): ?

TIME TO FAILURE (days): ?

FAILURE MECHANISM: ?

BREACH DIMENSIONS: ?

CONTROLS: -

DAM MATERIALS: Metamorphic rock and loess.

REFERENCES: Leonov, 1960.

COMMENTS: 33 villages destroyed and 12,000 - 20,000 killed by landslide from Khait earthquake.

07/15/91

COUNTRY: U.S.S.R.

SUBDIVISION: Tadzhik S.S.R., near Khait

DATE: 1949; 7/10

RIVER OR LAKE: Obi-Kabut River

TYPE OF LANDSLIDE: Avalanche, debris

TRIGGER: Earthquake

LANDSLIDE VOLUME (m^3): ?

DAM TYPE: II

DAM HEIGHT (m): ?

DAM LENGTH (m): ?

DAM WIDTH (m): ?

LAKE LENGTH (m): ?

LAKE VOLUME (m^3): ?

TIME TO FAILURE (days): ?

FAILURE MECHANISM: ?

BREACH DIMENSIONS: ?

CONTROLS: -

DAM MATERIALS: Metamorphic rocks and loess.

REFERENCES: Leonov, 1960.

COMMENTS: 33 villages destroyed and 12,000 - 20,000 killed by landslide caused by Khait earthquake.

07/15/91

COUNTRY: U.S.S.R.

SUBDIVISION: Tadzhik S.S.R., near Khait

DATE: 1949; 7/10

RIVER OR LAKE: Dubursa River tributary

TYPE OF LANDSLIDE: Avalanche, debris

TRIGGER: Earthquake

LANDSLIDE VOLUME (m^3): ?

DAM TYPE: ?

DAM HEIGHT (m): ?

DAM LENGTH (m): ?

DAM WIDTH (m): ?

LAKE LENGTH (m): ?

LAKE VOLUME (m^3): ?

TIME TO FAILURE (days): ?

FAILURE MECHANISM: ?

BREACH DIMENSIONS: ?

CONTROLS: -

DAM MATERIALS: Metamorphic rocks and loess.

REFERENCES: Leonov, 1960.

COMMENTS: 33 villages destroyed and 12,000 - 20,000 killed by landslides triggered by Khait earthquake

07/15/91

COUNTRY: U.S.S.R.

SUBDIVISION: Uzbek S.S.R., Atchy

DATE: 1973

RIVER OR LAKE: Angren River

TYPE OF LANDSLIDE: Slide, rock

TRIGGER: Human-caused (mining)

LANDSLIDE VOLUME (m^3): 600,000,000 - 700,000,000

DAM TYPE: II

DAM HEIGHT (m): 50 - 60

DAM LENGTH (m): ?

DAM WIDTH (m): ?

LAKE LENGTH (m): ?

LAKE VOLUME (m^3): ?

TIME TO FAILURE (days): ?

FAILURE MECHANISM: ?

BREACH DIMENSIONS: ?

CONTROLS: Diversion drain was dug.

DAM MATERIALS: Argillaceous sedimentary rocks.

REFERENCES: Zolotarev and others, 1978.

COMMENTS: Do not know if diversion channel drained lake or served as spillway.

07/15/91

COUNTRY: United States

SUBDIVISION: Alaska, Mount Spurr

DATE: 1953; 7/9

RIVER OR LAKE: Chakachatna River

TYPE OF LANDSLIDE: Flow, debris

TRIGGER: Rainfall; volcanic eruption

LANDSLIDE VOLUME (m^3): ?

DAM TYPE: ?

DAM HEIGHT (m): ?

DAM LENGTH (m): ?

DAM WIDTH (m): ?

LAKE LENGTH (m): 8,000

LAKE VOLUME (m^3): ?

TIME TO FAILURE (days): 2

FAILURE MECHANISM: ?

BREACH DIMENSIONS: ?

CONTROLS: -

DAM MATERIALS: Large boulders.

REFERENCES: Juhle and Coulter, 1955.

COMMENTS: By July 11 (2 days later) lake level dropped 4.6 m due to partial dam failure. Channel now paved with large boulders; little additional erosion.

07/15/91

COUNTRY: United States

SUBDIVISION: Alaska, near Seward

DATE: 1964; 3/27

RIVER OR LAKE: Box Canyon Creek

TYPE OF LANDSLIDE: Slide, rock and debris

TRIGGER: Earthquake

LANDSLIDE VOLUME (m^3): ?

DAM TYPE: II

DAM HEIGHT (m): 3 - 5

DAM LENGTH (m): ?

DAM WIDTH (m): ?

LAKE LENGTH (m): ?

LAKE VOLUME (m^3): ?

TIME TO FAILURE (days): Did not fail.

FAILURE MECHANISM: -

BREACH DIMENSIONS: -

CONTROLS: Channel bulldozed through the slide mass.

DAM MATERIALS: Boulders, cobbles, fine material.

REFERENCES: Lemke, 1967.

COMMENTS: -

07/15/91

COUNTRY: United States

SUBDIVISION: Alaska, near Seward

DATE: 1964; 3/27

RIVER OR LAKE: Jap Creek

TYPE OF LANDSLIDE: Slide, rock and debris

TRIGGER: Earthquake

LANDSLIDE VOLUME (m^3): ?

DAM TYPE: II

DAM HEIGHT (m): 5 - 8

DAM LENGTH (m): ?

DAM WIDTH (m): 125

LAKE LENGTH (m): ?

LAKE VOLUME (m^3): ?

TIME TO FAILURE (days): Did not fail.

FAILURE MECHANISM: -

BREACH DIMENSIONS: -

CONTROLS: No lake formed; water flowed through dam.

DAM MATERIALS: Glacial drift.

REFERENCES: Lemke, 1967.

COMMENTS: Because of coarseness of dam material, lake did not form.

07/15/91

COUNTRY: United States

SUBDIVISION: Alaska, near Seward

DATE: 1986; 10/?

RIVER OR LAKE: Spruce Creek

TYPE OF LANDSLIDE: Avalanche, debris

TRIGGER: Rainfall

LANDSLIDE VOLUME (m^3): 90,000

DAM TYPE: II

DAM HEIGHT (m): ?

DAM LENGTH (m): 50

DAM WIDTH (m): 200

LAKE LENGTH (m): ?

LAKE VOLUME (m^3): ?

TIME TO FAILURE (days): ?

FAILURE MECHANISM: ?

BREACH DIMENSIONS: ?

CONTROLS: -

DAM MATERIALS: Glacial till.

REFERENCES: Jones and Zenone, 1988.

COMMENTS: Catastrophic release of water eroded new channel below dam.

07/15/91

COUNTRY: United States

SUBDIVISION: Arizona, Coconino County, Grand Canyon National Park

DATE: 1984; 7/27

RIVER OR LAKE: Monument Creek

TYPE OF LANDSLIDE: Avalanche, debris

TRIGGER: Rainfall

LANDSLIDE VOLUME (m^3): ?

DAM TYPE: ?

DAM HEIGHT (m): 6

DAM LENGTH (m): ?

DAM WIDTH (m): ?

LAKE LENGTH (m): ?

LAKE VOLUME (m^3): ?

TIME TO FAILURE (days): ?

FAILURE MECHANISM: ?

BREACH DIMENSIONS: ?

CONTROLS: ?

DAM MATERIALS: Sandstone and colluvial debris.

REFERENCES: Webb and others, 1989.

COMMENTS: Dam had not failed as of 1986.

07/15/91

COUNTRY: United States

SUBDIVISION: Arizona, Coconino County, Grand Canyon National Park

DATE: 1966; 12/5

RIVER OR LAKE: Colorado River

TYPE OF LANDSLIDE: Flow, debris

TRIGGER: Rainfall

LANDSLIDE VOLUME (m^3): ?

DAM TYPE: II

DAM HEIGHT (m): ?

DAM LENGTH (m): ?

DAM WIDTH (m): ?

LAKE LENGTH (m): ?

LAKE VOLUME (m^3): ?

TIME TO FAILURE (days): ?

FAILURE MECHANISM: ?

BREACH DIMENSIONS: ?

CONTROLS: -

DAM MATERIALS: Coarse boulders and debris.

REFERENCES: Webb and others, 1989.

COMMENTS: Colorado River was 85 m wide in 1965. Debris flow came from Crystal Creek.

07/15/91

COUNTRY: United States

SUBDIVISION: California, Del Norte County

DATE: 1970; 1/24

RIVER OR LAKE: South Fork Smith River

TYPE OF LANDSLIDE: Flow, debris

TRIGGER: Rainfall

LANDSLIDE VOLUME (m^3): 1,100,000

DAM TYPE: III

DAM HEIGHT (m): 13.5

DAM LENGTH (m): 75

DAM WIDTH (m): 400

LAKE LENGTH (m): ?

LAKE VOLUME (m^3): 1,700,000

TIME TO FAILURE (days): 0.05

FAILURE MECHANISM: Overtopping

BREACH DIMENSIONS: ?

CONTROLS: -

DAM MATERIALS: Clay, rock, serpentinite blocks up to 2 m diameter.

REFERENCES: Evoy, 1982.

COMMENTS: Two dams at same site 4 years apart.

07/15/91

COUNTRY: United States

SUBDIVISION: California, Del Norte County

DATE: 1964; 12/?

RIVER OR LAKE: Hurdygurdy Creek

TYPE OF LANDSLIDE: ?

TRIGGER: Rainfall

LANDSLIDE VOLUME (m^3): ?

DAM TYPE: ?

DAM HEIGHT (m): ?

DAM LENGTH (m): ?

DAM WIDTH (m): ?

LAKE LENGTH (m): 5,000

LAKE VOLUME (m^3): ?

TIME TO FAILURE (days): ?

FAILURE MECHANISM: ?

BREACH DIMENSIONS: ?

CONTROLS: ?

DAM MATERIALS: ?

REFERENCES: Farrington and Savina, 1977.

COMMENTS: -

07/15/91

COUNTRY: United States

SUBDIVISION: California, Del Norte County

DATE: 1965; 12/28

RIVER OR LAKE: South Fork Smith River

TYPE OF LANDSLIDE: Flow, debris

TRIGGER: Rainfall

LANDSLIDE VOLUME (m^3): 1,900,000

DAM TYPE: III

DAM HEIGHT (m): 15

DAM LENGTH (m): 75

DAM WIDTH (m): 500

LAKE LENGTH (m): ?

LAKE VOLUME (m^3): 2,700,000

TIME TO FAILURE (days): 0.25

FAILURE MECHANISM: Overtopping

BREACH DIMENSIONS: ?

CONTROLS: -

DAM MATERIALS: Clay, rock, serpentinite blocks up to 2 m diameter.

REFERENCES: Evoy, 1982.

COMMENTS: Two dams at same site 4 years apart.

07/15/91

COUNTRY: United States

SUBDIVISION: California, Del Norte County

DATE: 1965; 12/28

RIVER OR LAKE: South Fork of Smith River

TYPE OF LANDSLIDE: Flow, debris

TRIGGER: Rainfall

LANDSLIDE VOLUME (m^3): 1,900,000

DAM TYPE: III

DAM HEIGHT (m): 15

DAM LENGTH (m): 75

DAM WIDTH (m): 500

LAKE LENGTH (m): ?

LAKE VOLUME (m^3): 2,700,000

TIME TO FAILURE (days): 0.25

FAILURE MECHANISM: Overtopping

BREACH DIMENSIONS: ?

CONTROLS: -

DAM MATERIALS: Clay, rock fragments, serpentinite blocks up to 1.7 m diameter.

REFERENCES: Evoy, 1982.

COMMENTS: These two debris flows occurred at the same site 4 years apart.

07/15/91

COUNTRY: United States

SUBDIVISION: California, Eldorado County

DATE: 1983; 4/9

RIVER OR LAKE: South Fork American River; Pony Express Lake

TYPE OF LANDSLIDE: Slide, rock

TRIGGER: Rainfall; undercutting

LANDSLIDE VOLUME (m^3): 3,000,000

DAM TYPE: II

DAM HEIGHT (m): 15

DAM LENGTH (m): 20

DAM WIDTH (m): 130

LAKE LENGTH (m): ?

LAKE VOLUME (m^3): 395,000 (area = 0.07 sq km)

TIME TO FAILURE (days): 0.35

FAILURE MECHANISM: Overtopping

BREACH DIMENSIONS: ?

CONTROLS: Natural armoring; spillway was dug.

DAM MATERIALS: Weathered granite.

REFERENCES: Kuehn and Bedrossian, 1987.

COMMENTS: Overtopping eroded 1.5 m from dam. 5/2/83, lake lowered 5 m by digging spillway. 5/24/83 spring runoff lowered channel 1.5 m; 5/31/83 landslide filled lake bed.

07/15/91

COUNTRY: United States

SUBDIVISION: California, Humboldt County

DATE: 1979 - 1980; (winter)

RIVER OR LAKE: Mosquito Creek, trib. of S Fork Trinity River

TYPE OF LANDSLIDE: Slide, debris

TRIGGER: Rainfall

LANDSLIDE VOLUME (m^3): 400,000

DAM TYPE: II

DAM HEIGHT (m): 9

DAM LENGTH (m): ?

DAM WIDTH (m): 60

LAKE LENGTH (m): ?

LAKE VOLUME (m^3): ?

TIME TO FAILURE (days): ?

FAILURE MECHANISM: ?

BREACH DIMENSIONS: ?

CONTROLS: -

DAM MATERIALS: Broken schist and slate.

REFERENCES: Dolcini, 1980.

COMMENTS: 23,000 cu m debris flow entered Mosquito Creek and formed dam.

07/15/91

COUNTRY: United States

SUBDIVISION: California, Humboldt County

DATE: 1983; 4/3

RIVER OR LAKE: Mattole River; "Lake Marijuana"

TYPE OF LANDSLIDE: Slide /flow, debris

TRIGGER: Rainfall

LANDSLIDE VOLUME (m^3): 9,500,000

DAM TYPE: III

DAM HEIGHT (m): 12

DAM LENGTH (m): 90

DAM WIDTH (m): 400

LAKE LENGTH (m): 2,200

LAKE VOLUME (m^3): ?

TIME TO FAILURE (days): Did not fail.

FAILURE MECHANISM: -

BREACH DIMENSIONS: -

CONTROLS: -

DAM MATERIALS: Large sandstone and conglomerate blocks, and silt.

REFERENCES: R. Scott, California Department of Water Resources, unpub. data, 1983.

COMMENTS: Winter precipitation was 150 percent of normal.
Natural spillway developed between debris-flow dam
and left streambank. Large blocks prevented
spillway erosion.

07/15/91

COUNTRY: United States

SUBDIVISION: California, Humboldt County

DATE: 1955; 12/?

RIVER OR LAKE: Grouse Creek

TYPE OF LANDSLIDE: Flow, earth

TRIGGER: Rainfall

LANDSLIDE VOLUME (m^3): ?

DAM TYPE: ?

DAM HEIGHT (m): ?

DAM LENGTH (m): ?

DAM WIDTH (m): ?

LAKE LENGTH (m): ?

LAKE VOLUME (m^3): ?

TIME TO FAILURE (days): 250

FAILURE MECHANISM: Overtopping

BREACH DIMENSIONS: ?

CONTROLS: -

DAM MATERIALS: Earth and debris.

REFERENCES: Buer and Senter, 1982.

COMMENTS: Devastation landslide formed two separate dams on Grouse Creek in 1955 and 1964.

07/15/91

COUNTRY: United States

SUBDIVISION: California, Humboldt County

DATE: 1964; 12/?

RIVER OR LAKE: Grouse Creek

TYPE OF LANDSLIDE: Flow, earth

TRIGGER: Rainfall

LANDSLIDE VOLUME (m^3): ?

DAM TYPE: ?

DAM HEIGHT (m): ?

DAM LENGTH (m): ?

DAM WIDTH (m): ?

LAKE LENGTH (m): ?

LAKE VOLUME (m^3): ?

TIME TO FAILURE (days): ?

FAILURE MECHANISM: ?

BREACH DIMENSIONS: ?

CONTROLS: -

DAM MATERIALS: Earth and debris.

REFERENCES: Buer and Senter, 1982.

COMMENTS: Devastation landslide formed two dams on Grouse Creek in 1955 and 1964.

07/15/91

COUNTRY: United States

SUBDIVISION: California, Humboldt County, 23 km upstream from Bridge

DATE: 1964; 12/?

RIVER OR LAKE: Van Duzen River

TYPE OF LANDSLIDE: Avalanche, debris

TRIGGER: Rainfall

LANDSLIDE VOLUME (m^3): 450,000

DAM TYPE: ?

DAM HEIGHT (m): 10

DAM LENGTH (m): ?

DAM WIDTH (m): ?

LAKE LENGTH (m): 3,000

LAKE VOLUME (m^3): 2,000,000

TIME TO FAILURE (days): 1

FAILURE MECHANISM: ?

BREACH DIMENSIONS: ?

CONTROLS: -

DAM MATERIALS: Siltstone and sandstone.

REFERENCES: Kelsey, 1976, 1977.

COMMENTS: Rapid drawdown of lake caused 14 major debris slides upstream, contributing 1,500,000 cu m of rock debris to channel.

07/15/91

COUNTRY: United States

SUBDIVISION: California, Lake County

DATE: 1906; 5/1

RIVER OR LAKE: Cache Creek

TYPE OF LANDSLIDE: Slide, debris

TRIGGER: Earthquake

LANDSLIDE VOLUME (m^3): 2,400,000

DAM TYPE: II

DAM HEIGHT (m): 30

DAM LENGTH (m): 120

DAM WIDTH (m): 240

LAKE LENGTH (m): 9,000

LAKE VOLUME (m^3): 14,900,000

TIME TO FAILURE (days): 5

FAILURE MECHANISM: Piping (?); overtopping (?)

BREACH DIMENSIONS: ?

CONTROLS: -

DAM MATERIALS: Cretaceous marine weathered shale and sandstone; no large rocks.

REFERENCES: Scott, 1970.

COMMENTS: Landslide area = 0.11 sq km; dam volume = 550,000 cu m; Scott estimates dam failed with water 2.5 m from overtopping or piping ? Downstream flooding.

07/15/91

COUNTRY: United States

SUBDIVISION: California, San Mateo County

DATE: 1906; 4/18

RIVER OR LAKE: Purisma Creek

TYPE OF LANDSLIDE: ?

TRIGGER: Earthquake

LANDSLIDE VOLUME (m^3): ?

DAM TYPE: II

DAM HEIGHT (m): 8 - 10

DAM LENGTH (m): ?

DAM WIDTH (m): ?

LAKE LENGTH (m): ?

LAKE VOLUME (m^3): ?

TIME TO FAILURE (days): ?

FAILURE MECHANISM: ?

BREACH DIMENSIONS: ?

CONTROLS: -

DAM MATERIALS: ?

REFERENCES: Lawson, 1908.

COMMENTS: -

07/15/91

COUNTRY: United States

SUBDIVISION: California, San Mateo County

DATE: 1906; 4/18

RIVER OR LAKE: San Gregorio Creek

TYPE OF LANDSLIDE: ?

TRIGGER: Earthquake

LANDSLIDE VOLUME (m^3): ?

DAM TYPE: ?

DAM HEIGHT (m): 2

DAM LENGTH (m): ?

DAM WIDTH (m): ?

LAKE LENGTH (m): ?

LAKE VOLUME (m^3): ?

TIME TO FAILURE (days): ?

FAILURE MECHANISM: ?

BREACH DIMENSIONS: ?

CONTROLS: -

DAM MATERIALS: ?

REFERENCES: Lawson, 1908.

COMMENTS: -

07/15/91

COUNTRY: United States

SUBDIVISION: California, Santa Cruz County

DATE: 1906; 4/18

RIVER OR LAKE: Los Gatos Creek

TYPE OF LANDSLIDE: ?

TRIGGER: Earthquake

LANDSLIDE VOLUME (m^3): ?

DAM TYPE: ?

DAM HEIGHT (m): ?

DAM LENGTH (m): ?

DAM WIDTH (m): ?

LAKE LENGTH (m): ?

LAKE VOLUME (m^3): ? ("large pool")

TIME TO FAILURE (days): ?

FAILURE MECHANISM: ?

BREACH DIMENSIONS: ?

CONTROLS: -

DAM MATERIALS: ?

REFERENCES: Lawson, 1908.

COMMENTS: -

07/15/91

COUNTRY: United States

SUBDIVISION: California, Santa Cruz County

DATE: 1982; 1/5

RIVER OR LAKE: Love Creek

TYPE OF LANDSLIDE: Flow, debris

TRIGGER: Rainfall

LANDSLIDE VOLUME (m^3): 460,000

DAM TYPE: III

DAM HEIGHT (m): 6

DAM LENGTH (m): 50

DAM WIDTH (m): 200

LAKE LENGTH (m): 300

LAKE VOLUME (m^3): ?

TIME TO FAILURE (days): ?

FAILURE MECHANISM: ?

BREACH DIMENSIONS: ?

CONTROLS: Workers dug spillway with backhoe to drain lake.

DAM MATERIALS: Deeply weathered soil from thinly bedded shale and sandstone.

REFERENCES: Cotton and Cochrane, 1982; Blair and others, 1985.

COMMENTS: Landslide killed 10 people.

07/15/91

COUNTRY: United States

SUBDIVISION: California, Santa Cruz County

DATE: 1989; 10/17

RIVER OR LAKE: Corralitos Creek

TYPE OF LANDSLIDE: Fall, rock

TRIGGER: Earthquake

LANDSLIDE VOLUME (m^3): 3,500

DAM TYPE: II

DAM HEIGHT (m): 7

DAM LENGTH (m): 10 - 15

DAM WIDTH (m): 20

LAKE LENGTH (m): 200

LAKE VOLUME (m^3): 6,000

TIME TO FAILURE (days): Did not fail.

FAILURE MECHANISM: -

BREACH DIMENSIONS: -

CONTROLS: Dam was excavated to lower lake level.

DAM MATERIALS: Sandstone fragments and blocks.

REFERENCES: Muraoka, 1989; D. Hope, Santa Cruz County Planning Dept., unpub. data, 1990.

COMMENTS: Landslide dam material removed to eliminate hazard using a hydraulic excavator.

07/15/91

COUNTRY: United States

SUBDIVISION: California, Santa Cruz County

DATE: 1989; 10/17

RIVER OR LAKE: Hinckley Creek

TYPE OF LANDSLIDE: Fall, rock

TRIGGER: Earthquake

LANDSLIDE VOLUME (m^3): 1,600

DAM TYPE: II

DAM HEIGHT (m): 5

DAM LENGTH (m): 15

DAM WIDTH (m): 15

LAKE LENGTH (m): 130

LAKE VOLUME (m^3): ? (depth = 4 m).

TIME TO FAILURE (days): Did not fail.

FAILURE MECHANISM: -

BREACH DIMENSIONS: -

CONTROLS: Spillway cut about 1 m deep. Lake still there in June 1990.

DAM MATERIALS: Sandstone fragments and blocks up to 1 m; large redwood trees.

REFERENCES: D. Hope, Santa Cruz County Planning Dept., unpub. data, 1990.

COMMENTS: Outlet had cut about half way through dam within a month.

07/15/91

COUNTRY: United States

SUBDIVISION: California, Santa Cruz County

DATE: 1989; 10/17

RIVER OR LAKE: Corralitos Creek

TYPE OF LANDSLIDE: Slide, rock

TRIGGER: Earthquake

LANDSLIDE VOLUME (m^3): 3,500

DAM TYPE: II

DAM HEIGHT (m): 3

DAM LENGTH (m): 25

DAM WIDTH (m): 15

LAKE LENGTH (m): 30

LAKE VOLUME (m^3): 1,200

TIME TO FAILURE (days): Did not fail.

FAILURE MECHANISM: -

BREACH DIMENSIONS: -

CONTROLS: Dam was excavated to lower water level.

DAM MATERIALS: Weathered sandstone and claystone.

REFERENCES: Muraoka, 1989; D. Hope, Santa Cruz County Planning Dept., unpub. data, 1990.

COMMENTS: Before earthquake, flow in creek was about 0.03 cu m/s. After earthquake, flow dramatically increased to about 0.71 cu m/s.

07/15/91

COUNTRY: United States

SUBDIVISION: California, Santa Cruz County

DATE: 1989; 10/17

RIVER OR LAKE: West Branch Soquel Creek

TYPE OF LANDSLIDE: Slump

TRIGGER: Earthquake

LANDSLIDE VOLUME (m^3): ?

DAM TYPE: II

DAM HEIGHT (m): 4

DAM LENGTH (m): 12

DAM WIDTH (m): 25

LAKE LENGTH (m): 75

LAKE VOLUME (m^3): 1,850

TIME TO FAILURE (days): 61 (failed 12/12/89)

FAILURE MECHANISM: Overtopping

BREACH DIMENSIONS: ?

CONTROLS: -

DAM MATERIALS: Medium-grained sandstone (Purisima Formation)

REFERENCES: D. Hope, Santa Cruz County Planning Dept., unpub. data, 1990.

COMMENTS: Dam had a lot of timber debris in it. Failure caused minor flooding considerable siltation in West Branch Soquel Creek.

07/15/91

COUNTRY: United States

SUBDIVISION: California, Santa Cruz County, Olive Springs

DATE: 1906; 4/18

RIVER OR LAKE: Hinckley Creek

TYPE OF LANDSLIDE: ?

TRIGGER: Earthquake

LANDSLIDE VOLUME (m^3): ?

DAM TYPE: ?

DAM HEIGHT (m): 20

DAM LENGTH (m): ?

DAM WIDTH (m): ?

LAKE LENGTH (m): ?

LAKE VOLUME (m^3): ? (depth = 20 m)

TIME TO FAILURE (days): ?

FAILURE MECHANISM: ?

BREACH DIMENSIONS: ?

CONTROLS: ?

DAM MATERIALS: ?

REFERENCES: Santa Cruz Morning Sentinel, 1906.

COMMENTS: This large landslide buried the Loma Prieta lumber mill, killing nine workers.

07/15/91

COUNTRY: United States

SUBDIVISION: California, Sonoma County

DATE: 1906; 4/18

RIVER OR LAKE: Maacama Creek

TYPE OF LANDSLIDE: Slide, rock

TRIGGER: Earthquake

LANDSLIDE VOLUME (m^3): ?

DAM TYPE: II

DAM HEIGHT (m): ?

DAM LENGTH (m): ?

DAM WIDTH (m): ?

LAKE LENGTH (m): ?

LAKE VOLUME (m^3): ?

TIME TO FAILURE (days): ?

FAILURE MECHANISM: ?

BREACH DIMENSIONS: ?

CONTROLS: -

DAM MATERIALS: Tuff.

REFERENCES: Lawson, 1908.

COMMENTS: -

07/15/91

COUNTRY: United States

SUBDIVISION: California, Sonoma County

DATE: 1906; 4/18

RIVER OR LAKE: Gualala River

TYPE OF LANDSLIDE: ?

TRIGGER: Earthquake

LANDSLIDE VOLUME (m^3): ?

DAM TYPE: IV

DAM HEIGHT (m): ?

DAM LENGTH (m): ?

DAM WIDTH (m): ?

LAKE LENGTH (m): ?

LAKE VOLUME (m^3): ?

TIME TO FAILURE (days): ?

FAILURE MECHANISM: ?

BREACH DIMENSIONS: ?

CONTROLS: -

DAM MATERIALS: ?

REFERENCES: Lawson, 1908.

COMMENTS: -

07/15/91

COUNTRY: United States

SUBDIVISION: California, Trinity County

DATE: 1890; 2/3

RIVER OR LAKE: Trinity River

TYPE OF LANDSLIDE: Slide, rock

TRIGGER: Rainfall and snowmelt

LANDSLIDE VOLUME (m^3): ?

DAM TYPE: II

DAM HEIGHT (m): ?

DAM LENGTH (m): ?

DAM WIDTH (m): ?

LAKE LENGTH (m): 22,000

LAKE VOLUME (m^3): ?

TIME TO FAILURE (days): 0.6

FAILURE MECHANISM: Overtopping

BREACH DIMENSIONS: ?

CONTROLS: -

DAM MATERIALS: Diorite.

REFERENCES: Hicks, 1974.

COMMENTS: River reported to take 10 years to erode to original channel level. Called "China Slide" because of miners killed by wave of water from slide.

07/15/91

COUNTRY: United States

SUBDIVISION: California, Tulare County, Sequoia National Park

DATE: 1867; 12/20

RIVER OR LAKE: Garfield Creek

TYPE OF LANDSLIDE: Avalanche, debris /flow, debris

TRIGGER: Rainfall (for 41 days prior to slide)

LANDSLIDE VOLUME (m^3): ?

DAM TYPE: III

DAM HEIGHT (m): 13

DAM LENGTH (m): 100

DAM WIDTH (m): 350

LAKE LENGTH (m): 200

LAKE VOLUME (m^3): ?

TIME TO FAILURE (days): 1

FAILURE MECHANISM: ?

BREACH DIMENSIONS: ?

CONTROLS: ?

DAM MATERIALS: Debris-flow materials with 1-m granite boulders.

REFERENCES: Fry, 1933; R.L. Schuster, U.S. Geological Survey, unpub. data, 1988.

COMMENTS: Two streams dammed by single debris flow from Snowslide Canyon into Garfield Creek, forming dam, then down Garfield Creek to South Fork Kaweah River, damming it.

07/15/91

COUNTRY: United States

SUBDIVISION: California, Tulare County, Sequoia National Park

DATE: 1867; 12/20

RIVER OR LAKE: South Fork Kaweah River

TYPE OF LANDSLIDE: Avalanche, debris /flow, debris

TRIGGER: Rainfall

LANDSLIDE VOLUME (m^3): ?

DAM TYPE: III

DAM HEIGHT (m): 20

DAM LENGTH (m): 100

DAM WIDTH (m): 200

LAKE LENGTH (m): 300

LAKE VOLUME (m^3): ?

TIME TO FAILURE (days): 1

FAILURE MECHANISM: ?

BREACH DIMENSIONS: ?

CONTROLS: ?

DAM MATERIALS: Debris-flow materials with 1-m granite boulders.

REFERENCES: Fry, 1933; R.L. Schuster, U.S. Geological Survey, unpub. data, 1988.

COMMENTS: Two streams dammed by single debris flow from Snowslide Canyon.

07/15/91

COUNTRY: United States

SUBDIVISION: Colorado, Eagle County

DATE: 1976

RIVER OR LAKE: Sweetwater Creek

TYPE OF LANDSLIDE: Flow, debris

TRIGGER: Rainfall

LANDSLIDE VOLUME (m^3): ?

DAM TYPE: ?

DAM HEIGHT (m): ?

DAM LENGTH (m): ?

DAM WIDTH (m): ?

LAKE LENGTH (m): ?

LAKE VOLUME (m^3): ?

TIME TO FAILURE (days): ?

FAILURE MECHANISM: ?

BREACH DIMENSIONS: ?

CONTROLS: ?

DAM MATERIALS: ?

REFERENCES: Costa and Jarrett, 1981.

COMMENTS: -

07/15/91

COUNTRY: United States

SUBDIVISION: Colorado, Grand County

DATE: 1985; 4/16

RIVER OR LAKE: Fraser River

TYPE OF LANDSLIDE: Slump /flow, debris

TRIGGER: Snowmelt

LANDSLIDE VOLUME (m^3): 3,000

DAM TYPE: III

DAM HEIGHT (m): 1 - 2

DAM LENGTH (m): ?

DAM WIDTH (m): 50 - 70

LAKE LENGTH (m): 300

LAKE VOLUME (m^3): ?

TIME TO FAILURE (days): Did not fail.

FAILURE MECHANISM: -

BREACH DIMENSIONS: -

CONTROLS: -

DAM MATERIALS: Colluvium from Precambrian igneous bedrock.

REFERENCES: Schuster, 1986.

COMMENTS: Slide in embankment of railroad, caused major train wreck. Formed low dam on Fraser River.

07/15/91

COUNTRY: United States

SUBDIVISION: Colorado, Gunnison County

DATE: 1986; 4/?

RIVER OR LAKE: Muddy Creek

TYPE OF LANDSLIDE: Slide, earth

TRIGGER: Snowmelt

LANDSLIDE VOLUME (m^3): 180,000,000

DAM TYPE: VI

DAM HEIGHT (m): 1

DAM LENGTH (m): 30

DAM WIDTH (m): 1,000

LAKE LENGTH (m): ?

LAKE VOLUME (m^3): ? (area = 0.14 sq km)

TIME TO FAILURE (days): Did not fail.

FAILURE MECHANISM: -

BREACH DIMENSIONS: -

CONTROLS: Channel dug out as landslide elevated it.

DAM MATERIALS: Tertiary mudstone.

REFERENCES: Stover and Cannon, 1988.

COMMENTS: Toe of slide went under Muddy Creek, which was uplifted as slide slowly advanced. Highway crew dug channel with power shovels.

07/15/91

COUNTRY: United States

SUBDIVISION: Colorado, Ouray County, Ouray

DATE: 1971

RIVER OR LAKE: Uncompahgre River

TYPE OF LANDSLIDE: Flow, debris

TRIGGER: Rainfall

LANDSLIDE VOLUME (m^3): ?

DAM TYPE: ?

DAM HEIGHT (m): ?

DAM LENGTH (m): ?

DAM WIDTH (m): ?

LAKE LENGTH (m): ?

LAKE VOLUME (m^3): ?

TIME TO FAILURE (days): ?

FAILURE MECHANISM: ?

BREACH DIMENSIONS: ?

CONTROLS: ?

DAM MATERIALS: ?

REFERENCES: Costa and Jarrett, 1981.

COMMENTS: Information obtained from Ouray newspaper.

07/15/91

COUNTRY: United States

SUBDIVISION: Maine, Cumberland County, Westbrook

DATE: 1868; 11/22

RIVER OR LAKE: Presumpscot River

TYPE OF LANDSLIDE: Slide, soil

TRIGGER: ?

LANDSLIDE VOLUME (m^3): 600,000

DAM TYPE: II

DAM HEIGHT (m): 5

DAM LENGTH (m): 60

DAM WIDTH (m): 500

LAKE LENGTH (m): 1,000

LAKE VOLUME (m^3): ?

TIME TO FAILURE (days): ?

FAILURE MECHANISM: ?

BREACH DIMENSIONS: ?

CONTROLS: -

DAM MATERIALS: Sensitive glacio-marine clay (Presumpscot Formation).

REFERENCES: Devin and Sandford, 1990.

COMMENTS: -

07/15/91

COUNTRY: United States

SUBDIVISION: Montana, Glacier County, Glacier National Park

DATE: 1910

RIVER OR LAKE: Otatso Creek; Slide Pond

TYPE OF LANDSLIDE: Avalanche, rock

TRIGGER: Rainfall

LANDSLIDE VOLUME (m^3): 7,000,000

DAM TYPE: V

DAM HEIGHT (m): 5

DAM LENGTH (m): 100

DAM WIDTH (m): 120

LAKE LENGTH (m): 400

LAKE VOLUME (m^3): ?

TIME TO FAILURE (days): Did not fail.

FAILURE MECHANISM: -

BREACH DIMENSIONS: -

CONTROLS: -

DAM MATERIALS: Limestone blocks and fragments.

REFERENCES: Butler and others, 1986.

COMMENTS: Two lakes formed from separate lobes of same landslide. Both still exist; this is smaller lake.

07/15/91

COUNTRY: United States

SUBDIVISION: Montana, Glacier County, Glacier National Park

DATE: 1910

RIVER OR LAKE: Otatso Creek; Slide Lake

TYPE OF LANDSLIDE: Avalanche, rock

TRIGGER: Rainfall

LANDSLIDE VOLUME (m^3): 7,000,000

DAM TYPE: V

DAM HEIGHT (m): 5

DAM LENGTH (m): 100

DAM WIDTH (m): 120

LAKE LENGTH (m): 1,000

LAKE VOLUME (m^3): ?

TIME TO FAILURE (days): Did not fail.

FAILURE MECHANISM: -

BREACH DIMENSIONS: -

CONTROLS: -

DAM MATERIALS: Limestone blocks and fragments.

REFERENCES: Butler and others, 1986.

COMMENTS: Two lakes formed from separate lobes of same landslide, both still exist; this is larger lake.

07/15/91

COUNTRY: United States

SUBDIVISION: Montana, Madison County

DATE: 1959; 8/17

RIVER OR LAKE: Madison River; Earthquake Lake

TYPE OF LANDSLIDE: Slide, rock

TRIGGER: Earthquake

LANDSLIDE VOLUME (m^3): 21,000,000

DAM TYPE: II

DAM HEIGHT (m): 60 - 70

DAM LENGTH (m): 500

DAM WIDTH (m): 1,600

LAKE LENGTH (m): 10,000

LAKE VOLUME (m^3): ? (depth = 60 m)

TIME TO FAILURE (days): Did not fail.

FAILURE MECHANISM: -

BREACH DIMENSIONS: -

CONTROLS: 75-m wide spillway built across dam.

DAM MATERIALS: Fragments of gneiss, schist, and dolomite.

REFERENCES: Hadley, 1964, 1978; Harrison, 1974.

COMMENTS: Spillway bottom has eroded downward about 6 m since construction.

07/15/91

COUNTRY: United States

SUBDIVISION: New York, Columbia County, near Hudson

DATE: 1915; 8/2

RIVER OR LAKE: Claverack Creek

TYPE OF LANDSLIDE: Slump

TRIGGER: Rainfall

LANDSLIDE VOLUME (m^3): ?

DAM TYPE: VI

DAM HEIGHT (m): 6

DAM LENGTH (m): ?

DAM WIDTH (m): ?

LAKE LENGTH (m): ?

LAKE VOLUME (m^3): ?

TIME TO FAILURE (days): ?

FAILURE MECHANISM: ?

BREACH DIMENSIONS: ?

CONTROLS: -

DAM MATERIALS: Lake Albany lacustrine blue and brown clays.

REFERENCES: Newland, 1916.

COMMENTS: -

07/15/91

COUNTRY: United States

SUBDIVISION: Oregon, Baker County

DATE: 1984; 8/?

RIVER OR LAKE: Powder River

TYPE OF LANDSLIDE: Slide, rock /avalanche, debris

TRIGGER: Rainfall

LANDSLIDE VOLUME (m^3): 6,000,000

DAM TYPE: II

DAM HEIGHT (m): 9

DAM LENGTH (m): 60

DAM WIDTH (m): 200

LAKE LENGTH (m): ?

LAKE VOLUME (m^3): 290,000 (area = 0.045 sq km)

TIME TO FAILURE (days): Did not fail.

FAILURE MECHANISM: -

BREACH DIMENSIONS: -

CONTROLS: High percentage of erosion-resistant basalt blocks.

DAM MATERIALS: Basalt debris.

REFERENCES: Geist and Schuster, 1986.

COMMENTS: -

07/15/91

COUNTRY: United States

SUBDIVISION: Oregon, Hood River County

DATE: 1980; 12/25

RIVER OR LAKE: East Fork Hood River

TYPE OF LANDSLIDE: Flow, debris

TRIGGER: Rainfall

LANDSLIDE VOLUME (m^3): 70,000 - 100,000

DAM TYPE: III

DAM HEIGHT (m): 11

DAM LENGTH (m): 100

DAM WIDTH (m): 225

LAKE LENGTH (m): ?

LAKE VOLUME (m^3): 105,000

TIME TO FAILURE (days): 0.01

FAILURE MECHANISM: Overtopping

BREACH DIMENSIONS: ?

CONTROLS: -

DAM MATERIALS: Volcanic debris.

REFERENCES: Gallino and Pierson, 1984.

COMMENTS: Resulting flood caused much damage to state highway.

07/15/91

COUNTRY: United States

SUBDIVISION: Oregon, Josephine County

DATE: 1988 - 1989; (winter)

RIVER OR LAKE: Silver Creek

TYPE OF LANDSLIDE: Fall, rock

TRIGGER: ?

LANDSLIDE VOLUME (m^3): 17,000

DAM TYPE: II

DAM HEIGHT (m): 12

DAM LENGTH (m): 30

DAM WIDTH (m): 92

LAKE LENGTH (m): 610

LAKE VOLUME (m^3): 57,400

TIME TO FAILURE (days): 365 (failed 1/2-3/90).

FAILURE MECHANISM: ?

BREACH DIMENSIONS: ?

CONTROLS: Wide dam in narrow bedrock valley; large, coarse, angular blocks.

DAM MATERIALS: Gabbro, large angular blocks, few fines; d50= 274 mm; d90= 724 mm.

REFERENCES: Cornell and Carroll, 1989; J. Cornell, U.S. Forest Service, unpub. data, 1990.

COMMENTS: Dam was overtopped, estimated flow from overtopping and seepage was 10 cu m/s. Lake level varied 10-12 m with season; failed during large rainstorm; 85 % of dam washed away; small pool remains.

07/15/91

COUNTRY: United States

SUBDIVISION: Oregon, Tillamook County

DATE: 1964; 12/?

RIVER OR LAKE: Wilson River

TYPE OF LANDSLIDE: Flow, debris

TRIGGER: Rainfall

LANDSLIDE VOLUME (m^3): 450,000

DAM TYPE: ?

DAM HEIGHT (m): 20

DAM LENGTH (m): ?

DAM WIDTH (m): 135

LAKE LENGTH (m): ?

LAKE VOLUME (m^3): ? (depth = 20 m)

TIME TO FAILURE (days): Did not fail.

FAILURE MECHANISM: -

BREACH DIMENSIONS: -

CONTROLS: Dam made of huge tightly locked boulders and smaller fragments.

DAM MATERIALS: Mud, trees, rock debris.

REFERENCES: Association of Engineering Geologists, 1971.

COMMENTS: Dam had to be excavated before the lake could be lowered enough to begin removal of slide blocking the highway.

07/15/91

COUNTRY: United States

SUBDIVISION: Oregon, Tillamook County

DATE: 1991; 4/4

RIVER OR LAKE: Wilson River

TYPE OF LANDSLIDE: Slide, debris

TRIGGER: Rainfall

LANDSLIDE VOLUME (m^3): 760,000

DAM TYPE: II

DAM HEIGHT (m): 6

DAM LENGTH (m): 50

DAM WIDTH (m): 100

LAKE LENGTH (m): 490

LAKE VOLUME (m^3): ?

TIME TO FAILURE (days): Did not fail.

FAILURE MECHANISM: -

BREACH DIMENSIONS: -

CONTROLS: ?

DAM MATERIALS: Broken Eocene volcanic rock and colluvium.

REFERENCES: Oregonian, 1991; R.L. Schuster, personal observations.

COMMENTS: Large boulders make up dam. Lake and dam at full height on 10 May 1991. Control measures not yet implemented.

07/15/91

COUNTRY: United States

SUBDIVISION: South Dakota, Shannon County, Pine Ridge Reservation

DATE: 1988; 11/19-25

RIVER OR LAKE: Cedar Creek

TYPE OF LANDSLIDE: Slump-slide, earth

TRIGGER: ?

LANDSLIDE VOLUME (m^3): 1,700,000

DAM TYPE: I

DAM HEIGHT (m): 3

DAM LENGTH (m): 30

DAM WIDTH (m): 150

LAKE LENGTH (m): 1,300

LAKE VOLUME (m^3): 53,000

TIME TO FAILURE (days): 105 (failed 3/9/89)

FAILURE MECHANISM: Overtopping

BREACH DIMENSIONS: Depth = 2 m; top w = 10 m; bottom w = 8 m.

CONTROLS: -

DAM MATERIALS: Pierre Shale.

REFERENCES: Sheikh, 1989; R.L. Schuster, U.S. Geological Survey, unpub. data, 1989.

COMMENTS: Part of dam is type VI; 75 m of old stream bed raised as much as 3-4 m. Stream moved to right and cut new channel around toe of slide.

07/15/91

COUNTRY: United States

SUBDIVISION: Utah, Grand County, Moab

DATE: 1923; 8/16

RIVER OR LAKE: Colorado River

TYPE OF LANDSLIDE: Flow, mud

TRIGGER: Rainfall

LANDSLIDE VOLUME (m^3): ?

DAM TYPE: III

DAM HEIGHT (m): ?

DAM LENGTH (m): ?

DAM WIDTH (m): ?

LAKE LENGTH (m): ?

LAKE VOLUME (m^3): ?

TIME TO FAILURE (days): 1

FAILURE MECHANISM: Overtopping

BREACH DIMENSIONS: ?

CONTROLS: -

DAM MATERIALS: ?

REFERENCES: Woolley, 1946.

COMMENTS: Flood from tributary wash dammed river.

07/15/91

COUNTRY: United States

SUBDIVISION: Utah, Juab County

DATE: 1931; 8/14

RIVER OR LAKE: Dragon Canyon unnamed tributary

TYPE OF LANDSLIDE: Flow, debris

TRIGGER: Rainfall

LANDSLIDE VOLUME (m^3): ?

DAM TYPE: ?

DAM HEIGHT (m): ?

DAM LENGTH (m): ?

DAM WIDTH (m): ?

LAKE LENGTH (m): ?

LAKE VOLUME (m^3): ?

TIME TO FAILURE (days): 1

FAILURE MECHANISM: Overtopping

BREACH DIMENSIONS: ?

CONTROLS: -

DAM MATERIALS: ?

REFERENCES: Woolley, 1946.

COMMENTS: -

07/15/91

COUNTRY: United States

SUBDIVISION: Utah, Juab County, near Levan

DATE: 1984; 5/12

RIVER OR LAKE: Chicken Creek

TYPE OF LANDSLIDE: Slump, earth

TRIGGER: Snowmelt

LANDSLIDE VOLUME (m^3): ?

DAM TYPE: II

DAM HEIGHT (m): 6

DAM LENGTH (m): 50

DAM WIDTH (m): ?

LAKE LENGTH (m): 170

LAKE VOLUME (m^3): 20,000

TIME TO FAILURE (days): 0.13

FAILURE MECHANISM: Overtopping

BREACH DIMENSIONS: ?

CONTROLS: -

DAM MATERIALS: Shale debris.

REFERENCES: R.L. Schuster, personal observation.

COMMENTS: Lake overtopped dam and slowly eroded it away by removing fines. Too small to cause any large flood.

07/15/91

COUNTRY: United States

SUBDIVISION: Utah, Kane County, Hackberry Canyon

DATE: 1988; 4/?

RIVER OR LAKE: Hackberry Creek

TYPE OF LANDSLIDE: Fall, rock

TRIGGER: Undercutting

LANDSLIDE VOLUME (m^3): ?

DAM TYPE: II

DAM HEIGHT (m): 10

DAM LENGTH (m): 30

DAM WIDTH (m): ?

LAKE LENGTH (m): 75

LAKE VOLUME (m^3): ?

TIME TO FAILURE (days): Did not fail.

FAILURE MECHANISM: -

BREACH DIMENSIONS: -

CONTROLS: Large blocks of rock allowed seepage through dam.

DAM MATERIALS: Large sandstone blocks.

REFERENCES: Doeling, 1988.

COMMENTS: Blocks up to 10m x 6m, allowed seepage and washing out of fines by stream. Depth 1.3 m on April 28, 1988, but had been deeper.

07/15/91

COUNTRY: United States

SUBDIVISION: Utah, San Pete County, Fairview Canyon

DATE: 1983

RIVER OR LAKE: Cottonwood Creek

TYPE OF LANDSLIDE: Slump /avalanche, debris

TRIGGER: Snowmelt

LANDSLIDE VOLUME (m^3): ?

DAM TYPE: II

DAM HEIGHT (m): 5

DAM LENGTH (m): ?

DAM WIDTH (m): ?

LAKE LENGTH (m): ?

LAKE VOLUME (m^3): ?

TIME TO FAILURE (days): 0.6

FAILURE MECHANISM: Overtopping

BREACH DIMENSIONS: ?

CONTROLS: -

DAM MATERIALS: Soft sedimentary rocks.

REFERENCES: R.L. Schuster, U.S. Geological Survey, unpub. data, 1983.

COMMENTS: Very steep gradient; therefore, small lake formed.

07/15/91

COUNTRY: United States

SUBDIVISION: Utah, San Pete County, Fairview Canyon

DATE: 1984; 5/13

RIVER OR LAKE: Cottonwood Creek

TYPE OF LANDSLIDE: Flow, debris

TRIGGER: Snowmelt

LANDSLIDE VOLUME (m^3): ?

DAM TYPE: III

DAM HEIGHT (m): 2.5

DAM LENGTH (m): 20

DAM WIDTH (m): 50

LAKE LENGTH (m): 50

LAKE VOLUME (m^3): ?

TIME TO FAILURE (days): Did not fail.

FAILURE MECHANISM: -

BREACH DIMENSIONS: -

CONTROLS: Dam slowly eroded through by small stream.

DAM MATERIALS: Silt to large limestone blocks.

REFERENCES: R.L. Schuster, U.S. Geological Survey, unpub. data, 1984.

COMMENTS: Practically no lake remained in June 1985.

07/15/91

COUNTRY: United States

SUBDIVISION: Utah, Sevier County, Brown's Hole

DATE: 1984; 5/?

RIVER OR LAKE: Dead Horse Creek tributary

TYPE OF LANDSLIDE: Flow, debris

TRIGGER: Snowmelt

LANDSLIDE VOLUME (m^3): 150,000

DAM TYPE: III

DAM HEIGHT (m): 4

DAM LENGTH (m): 100

DAM WIDTH (m): 200

LAKE LENGTH (m): 170

LAKE VOLUME (m^3): 9,000

TIME TO FAILURE (days): ?

FAILURE MECHANISM: ?

BREACH DIMENSIONS: ?

CONTROLS: ?

DAM MATERIALS: Clayey debris with sandstone and limestone blocks.

REFERENCES: R.L. Schuster, U.S. Geological Survey, unpub. data, 1984.

COMMENTS: -

07/15/91

COUNTRY: United States

SUBDIVISION: Utah, Utah County, Provo Canyon, 16 km NE of Provo

DATE: 1938; 7/13

RIVER OR LAKE: Provo River

TYPE OF LANDSLIDE: Flow, debris

TRIGGER: Rainfall

LANDSLIDE VOLUME (m^3): ?

DAM TYPE: ?

DAM HEIGHT (m): ?

DAM LENGTH (m): ?

DAM WIDTH (m): 100

LAKE LENGTH (m): ?

LAKE VOLUME (m^3): ?

TIME TO FAILURE (days): Did not fail.

FAILURE MECHANISM: -

BREACH DIMENSIONS: -

CONTROLS: Spillway constructed by draglines, 9 days to complete.

DAM MATERIALS: ?

REFERENCES: Woolley, 1946.

COMMENTS: -

07/15/91

COUNTRY: United States

SUBDIVISION: Utah, Utah County, Provo Canyon, 20 km NE of Provo

DATE: 1930; 8/12

RIVER OR LAKE: Provo River

TYPE OF LANDSLIDE: Flow, debris

TRIGGER: Rainfall

LANDSLIDE VOLUME (m^3): ?

DAM TYPE: ?

DAM HEIGHT (m): 2.5

DAM LENGTH (m): ?

DAM WIDTH (m): ?

LAKE LENGTH (m): ?

LAKE VOLUME (m^3): ?

TIME TO FAILURE (days): 14

FAILURE MECHANISM: Overtopping

BREACH DIMENSIONS: ?

CONTROLS: -

DAM MATERIALS: ?

REFERENCES: Woolley, 1946

COMMENTS: -

07/15/91

COUNTRY: United States

SUBDIVISION: Utah, Utah County, Provo Canyon, 20 km NE of Provo

DATE: 1931; 7/30

RIVER OR LAKE: Provo River

TYPE OF LANDSLIDE: Flow, debris

TRIGGER: Rainfall

LANDSLIDE VOLUME (m^3): ?

DAM TYPE: ?

DAM HEIGHT (m): 6

DAM LENGTH (m): ?

DAM WIDTH (m): 120

LAKE LENGTH (m): ?

LAKE VOLUME (m^3): ?

TIME TO FAILURE (days): ?

FAILURE MECHANISM: Overtopping

BREACH DIMENSIONS: ?

CONTROLS: -

DAM MATERIALS: ?

REFERENCES: Woolley, 1946.

COMMENTS: -

07/15/91

COUNTRY: United States

SUBDIVISION: Utah, Utah County, Provo Canyon, 20 km NE of Provo

DATE: 1938; 7/13

RIVER OR LAKE: Provo River

TYPE OF LANDSLIDE: Flow, debris

TRIGGER: Rainfall

LANDSLIDE VOLUME (m^3): 38,000

DAM TYPE: ?

DAM HEIGHT (m): 4

DAM LENGTH (m): ?

DAM WIDTH (m): 120

LAKE LENGTH (m): 2,500

LAKE VOLUME (m^3): ?

TIME TO FAILURE (days): ?

FAILURE MECHANISM: ?

BREACH DIMENSIONS: ?

CONTROLS: -

DAM MATERIALS: ?

REFERENCES: Woolley, 1946.

COMMENTS: -

07/15/91

COUNTRY: United States

SUBDIVISION: Utah, Utah County, Thistle

DATE: 1983; 4/?

RIVER OR LAKE: Spanish Fork River

TYPE OF LANDSLIDE: Slide, debris

TRIGGER: Snowmelt

LANDSLIDE VOLUME (m^3): 22,000,000

DAM TYPE: II

DAM HEIGHT (m): 63

DAM LENGTH (m): 200

DAM WIDTH (m): 450

LAKE LENGTH (m): 6,000

LAKE VOLUME (m^3): 78,000,000

TIME TO FAILURE (days): Did not fail.

FAILURE MECHANISM: -

BREACH DIMENSIONS: -

CONTROLS: Drainage tunnel through dam; permanent one through right abutment.

DAM MATERIALS: Plastic gravelly clay from argillaceous sedimentary rocks.

REFERENCES: Hansen and Morgan, 1986; Kaliser and Fleming, 1986.

COMMENTS: -

07/15/91

COUNTRY: United States

SUBDIVISION: Utah, Washington County, Zion National Park

DATE: 1923

RIVER OR LAKE: Virgin River

TYPE OF LANDSLIDE: Slide, rock

TRIGGER: ?

LANDSLIDE VOLUME (m^3): ?

DAM TYPE: ?

DAM HEIGHT (m): ?

DAM LENGTH (m): ?

DAM WIDTH (m): ?

LAKE LENGTH (m): ?

LAKE VOLUME (m^3): ?

TIME TO FAILURE (days): ?

FAILURE MECHANISM: ?

BREACH DIMENSIONS: ?

CONTROLS: ?

DAM MATERIALS: ?

REFERENCES: Grater, 1945

COMMENTS: -

07/15/91

COUNTRY: United States

SUBDIVISION: Utah, Washington County, Zion National Park

DATE: 1941

RIVER OR LAKE: Virgin River

TYPE OF LANDSLIDE: Slide, rock

TRIGGER: ?

LANDSLIDE VOLUME (m^3): 115,000

DAM TYPE: ?

DAM HEIGHT (m): ?

DAM LENGTH (m): ?

DAM WIDTH (m): ?

LAKE LENGTH (m): ?

LAKE VOLUME (m^3): ?

TIME TO FAILURE (days): ?

FAILURE MECHANISM: ?

BREACH DIMENSIONS: ?

CONTROLS: ?

DAM MATERIALS: ?

REFERENCES: Grater, 1945

COMMENTS: -

07/15/91

COUNTRY: United States

SUBDIVISION: Utah, Washington County, near Zion National Park

DATE: 1990; 5/?

RIVER OR LAKE: Kolob Creek, trib. of Virgin River

TYPE OF LANDSLIDE: Slide, rock /avalanche, debris

TRIGGER: ?

LANDSLIDE VOLUME (m^3): ?

DAM TYPE: II

DAM HEIGHT (m): 6

DAM LENGTH (m): 9

DAM WIDTH (m): 40

LAKE LENGTH (m): 400

LAKE VOLUME (m^3): 6,000

TIME TO FAILURE (days): 15 (did not fail)

FAILURE MECHANISM: -

BREACH DIMENSIONS: -

CONTROLS: Navajo Sandstone blocks apparently resistant to erosion.

DAM MATERIALS: Sandstone blocks.

REFERENCES: U.S. Department of the Interior, 1990.

COMMENTS: After overtopping, spillway was slowly eroded downward. No major downstream flooding occurred. This is in a remote wilderness area. Spillway eroded to depth of about 1 meter.

07/15/91

COUNTRY: United States

SUBDIVISION: Vermont, Windsor County

DATE: 1984; 5/?

RIVER OR LAKE: Ottauqueche River tributary

TYPE OF LANDSLIDE: Flow, earth

TRIGGER: Rainfall and snowmelt

LANDSLIDE VOLUME (m^3): 21,000

DAM TYPE: ?

DAM HEIGHT (m): 2.5

DAM LENGTH (m): ?

DAM WIDTH (m): ?

LAKE LENGTH (m): ?

LAKE VOLUME (m^3): ?

TIME TO FAILURE (days): ?

FAILURE MECHANISM: Overtopping

BREACH DIMENSIONS: ?

CONTROLS: ?

DAM MATERIALS: Glacial lake deposits.

REFERENCES: Baskerville and Ohlmacher, 1988.

COMMENTS: -

07/15/91

COUNTRY: United States

SUBDIVISION: Virginia, Nelson County, near Roseland

DATE: 1969; 8/19-20

RIVER OR LAKE: Ginseng Hollow creek

TYPE OF LANDSLIDE: Avalanche, soil /flow, mud

TRIGGER: Rainfall

LANDSLIDE VOLUME (m^3): 1,600

DAM TYPE: ?

DAM HEIGHT (m): 2

DAM LENGTH (m): 5

DAM WIDTH (m): 100

LAKE LENGTH (m): ?

LAKE VOLUME (m^3): 140

TIME TO FAILURE (days): 0.01

FAILURE MECHANISM: Overtopping

BREACH DIMENSIONS: ?

CONTROLS: -

DAM MATERIALS: ?

REFERENCES: Guy, 1971.

COMMENTS: Well-documented example of very rapid formation and failure.

07/15/91

COUNTRY: United States

SUBDIVISION: Washington, Cowlitz County

DATE: 1980; 5/18

RIVER OR LAKE: South Fork Castle Creek; Castle Lake

TYPE OF LANDSLIDE: Avalanche, debris

TRIGGER: Volcanic eruption

LANDSLIDE VOLUME (m^3): 2,800,000,000

DAM TYPE: III

DAM HEIGHT (m): 37

DAM LENGTH (m): ?

DAM WIDTH (m): ?

LAKE LENGTH (m): 2,000

LAKE VOLUME (m^3): 24,000,000

TIME TO FAILURE (days): Did not fail.

FAILURE MECHANISM: -

BREACH DIMENSIONS: -

CONTROLS: Spillway constructed.

DAM MATERIALS: Volcanic debris.

REFERENCES: Meyer and others, 1986.

COMMENTS: Has not failed, much ground-water data available.

07/15/91

COUNTRY: United States

SUBDIVISION: Washington, Cowlitz County

DATE: 1980; 5/18

RIVER OR LAKE: Coldwater Creek; Coldwater Lake

TYPE OF LANDSLIDE: Avalanche, debris

TRIGGER: Volcanic eruption

LANDSLIDE VOLUME (m^3): 2,800,000,000

DAM TYPE: III

DAM HEIGHT (m): 71

DAM LENGTH (m): ?

DAM WIDTH (m): ?

LAKE LENGTH (m): 3,500

LAKE VOLUME (m^3): 83,000,000

TIME TO FAILURE (days): Did not fail.

FAILURE MECHANISM: -

BREACH DIMENSIONS: -

CONTROLS: Spillway constructed.

DAM MATERIALS: Volcanic debris.

REFERENCES: Meyer and others, 1986.

COMMENTS: Has not failed.

07/15/91

COUNTRY: United States

SUBDIVISION: Washington, Cowlitz County

DATE: 1980; 5/18

RIVER OR LAKE: North Fork Toutle River; Elk Rock Lake

TYPE OF LANDSLIDE: Avalanche, debris

TRIGGER: Volcanic eruption

LANDSLIDE VOLUME (m^3): 2,800,000,000

DAM TYPE: III

DAM HEIGHT (m): 9

DAM LENGTH (m): ?

DAM WIDTH (m): ?

LAKE LENGTH (m): ?

LAKE VOLUME (m^3): 300,000

TIME TO FAILURE (days): 63

FAILURE MECHANISM: Overtopping

BREACH DIMENSIONS: ?

CONTROLS: -

DAM MATERIALS: Volcanic debris.

REFERENCES: Jennings and others, 1981.

COMMENTS: Flood peak flow was 450 cu m/s.

07/15/91

COUNTRY: United States

SUBDIVISION: Washington, Cowlitz County

DATE: 1980; 5/18

RIVER OR LAKE: North Fork Toutle River; Jackson Creek Lake

TYPE OF LANDSLIDE: Avalanche, debris

TRIGGER: Volcanic eruption

LANDSLIDE VOLUME (m^3): 2,800,000,000

DAM TYPE: III

DAM HEIGHT (m): 4.5

DAM LENGTH (m): 975

DAM WIDTH (m): 180 - 425

LAKE LENGTH (m): 820

LAKE VOLUME (m^3): 2,470,000

TIME TO FAILURE (days): 644 (failed 2/20/82)

FAILURE MECHANISM: Overtopping

BREACH DIMENSIONS: ?

CONTROLS: Dug spillway.

DAM MATERIALS: Volcanic debris.

REFERENCES: R.J. Janda, 1991, U.S. Geological Survey, unpub. data.

COMMENTS: On Feb. 20, 1982, North Fork Toutle River flowed into Jackson Lake, and caused it to overflow and fail. Estimated peak discharge from failure was 477 cu m/s.

07/15/91

COUNTRY: United States

SUBDIVISION: Washington, King County

DATE: 1967

RIVER OR LAKE: Tolt River

TYPE OF LANDSLIDE: Slump

TRIGGER: Undercutting

LANDSLIDE VOLUME (m^3): ?

DAM TYPE: II

DAM HEIGHT (m): ?

DAM LENGTH (m): ?

DAM WIDTH (m): ?

LAKE LENGTH (m): ?

LAKE VOLUME (m^3): ?

TIME TO FAILURE (days): 1

FAILURE MECHANISM: ?

BREACH DIMENSIONS: ?

CONTROLS: -

DAM MATERIALS: Silty till mixed with gravel.

REFERENCES: Foxworthy, 1978.

COMMENTS: Failure sent 2-m flood wave down river for short distance.

07/15/91

COUNTRY: United States

SUBDIVISION: Washington, Kittitas County, 9 km E of Cle Elum

DATE: 1947; 8/30

RIVER OR LAKE: Yakima River

TYPE OF LANDSLIDE: Slump

TRIGGER: Human-caused (irrigation seepage)

LANDSLIDE VOLUME (m^3): 3,000,000 - 4,000,000

DAM TYPE: II

DAM HEIGHT (m): 5 - 10

DAM LENGTH (m): 200

DAM WIDTH (m): 400

LAKE LENGTH (m): ?

LAKE VOLUME (m^3): ?

TIME TO FAILURE (days): 5

FAILURE MECHANISM: ?

BREACH DIMENSIONS: ?

CONTROLS: ?

DAM MATERIALS: Clay, silt, sand, gravel, boulders from high river terrace.

REFERENCES: Engineering-News Record, 1947; Welch, 1947.

COMMENTS: Breaching was aided by removal of material by Milwaukee railroad crews.

07/15/91

COUNTRY: United States

SUBDIVISION: Washington, Lewis County

DATE: 1949; 4/13

RIVER OR LAKE: Cowlitz River

TYPE OF LANDSLIDE: Slump /flow, earth

TRIGGER: Earthquake

LANDSLIDE VOLUME (m^3): 15,000 - 20,000

DAM TYPE: II

DAM HEIGHT (m): 5

DAM LENGTH (m): 40 - 50

DAM WIDTH (m): 50 - 80

LAKE LENGTH (m): ?

LAKE VOLUME (m^3): ? (Probably only 3-4 m deep)

TIME TO FAILURE (days): ?

FAILURE MECHANISM: Overtopping

BREACH DIMENSIONS: ?

CONTROLS: ?

DAM MATERIALS: Sand and gravel from alluvial terrace.

REFERENCES: Derossett, Hubert, 1988, personal commun., Randle, WA.

COMMENTS: Occurred as slump on vertical face of sand and gravel river terrace.

07/15/91

COUNTRY: United States

SUBDIVISION: Washington, Skamania County

DATE: 1980

RIVER OR LAKE: North Fork Toutle River; Spirit Lake

TYPE OF LANDSLIDE: Avalanche, debris

TRIGGER: Volcanic eruption

LANDSLIDE VOLUME (m^3): 2,800,000,000

DAM TYPE: III

DAM HEIGHT (m): 69

DAM LENGTH (m): ?

DAM WIDTH (m): ?

LAKE LENGTH (m): 5,000

LAKE VOLUME (m^3): 330,000,000 (Aug, 1982)

TIME TO FAILURE (days): Did not fail.

FAILURE MECHANISM: -

BREACH DIMENSIONS: -

CONTROLS: Lake lowered by pumping; construction of diversion tunnel.

DAM MATERIALS: Volcanic debris from Mount St. Helens.

REFERENCES: Schuster, 1985; Meyer and others, 1986.

COMMENTS: Permanent volume of lake is 259,000,000 cu m.

07/15/91

COUNTRY: United States

SUBDIVISION: Washington, Thurston County (below Ohop Creek)

DATE: 1990; 9/16

RIVER OR LAKE: Nisqually River

TYPE OF LANDSLIDE: Slump

TRIGGER: Undercutting ?

LANDSLIDE VOLUME (m^3): 200,000

DAM TYPE: I

DAM HEIGHT (m): 7

DAM LENGTH (m): 240

DAM WIDTH (m): 170

LAKE LENGTH (m): 1,000

LAKE VOLUME (m^3): ? (depth = 3 - 4.5 m)

TIME TO FAILURE (days): Did not fail.

FAILURE MECHANISM: -

BREACH DIMENSIONS: -

CONTROLS: -

DAM MATERIALS: Tertiary fine-grained volcaniclastics and late Wisconsinan till.

REFERENCES: Pringle, 1990.

COMMENTS: River diverted to north bank by landslide and flows through forested floodplain back into channel downstream.

07/15/91

COUNTRY: United States

SUBDIVISION: Washington, Whatcom County

DATE: 1983; 1/10

RIVER OR LAKE: Lake Whatcom tributary

TYPE OF LANDSLIDE: Slide, rock

TRIGGER: Rainfall

LANDSLIDE VOLUME (m^3): ?

DAM TYPE: II

DAM HEIGHT (m): 10

DAM LENGTH (m): ?

DAM WIDTH (m): 250

LAKE LENGTH (m): ?

LAKE VOLUME (m^3): ?

TIME TO FAILURE (days): Did not fail.

FAILURE MECHANISM: -

BREACH DIMENSIONS: -

CONTROLS: Never overtopped because of seepage through sandstone blocks.

DAM MATERIALS: Sandstone.

REFERENCES: G.W. Thorsen, Division of Geology and Earth Resources, State of Washington, Olympia, personal commun., 1987.

COMMENTS: -

07/15/91

COUNTRY: United States

SUBDIVISION: West Virginia, Grant County, Smoke Hole Canyon

DATE: 1949; 6/17-18

RIVER OR LAKE: North Fork of South Branch Potomac River

TYPE OF LANDSLIDE: Avalanche, debris

TRIGGER: Rainfall

LANDSLIDE VOLUME (m^3): ?

DAM TYPE: ?

DAM HEIGHT (m): ?

DAM LENGTH (m): ?

DAM WIDTH (m): ?

LAKE LENGTH (m): ?

LAKE VOLUME (m^3): ?

TIME TO FAILURE (days): ?

FAILURE MECHANISM: ?

BREACH DIMENSIONS: ?

CONTROLS: -

DAM MATERIALS: Tuscarora Sandstone, sand, gravel, rocks.

REFERENCES: Allard, 1951; Stringfield and Smith, 1956.

COMMENTS: "Huge dams" "When these natural dams finally gave way, great walls of water swept down into the Moosefield Valley above Petersburg with devastating force."

07/15/91

COUNTRY: United States

SUBDIVISION: Wyoming, Lincoln County, 7 km NE of Afton

DATE: 1984; 5/?

RIVER OR LAKE: Swift Creek

TYPE OF LANDSLIDE: Avalanche, debris

TRIGGER: Snowmelt

LANDSLIDE VOLUME (m^3): 10,000

DAM TYPE: III

DAM HEIGHT (m): 5

DAM LENGTH (m): 25

DAM WIDTH (m): 100

LAKE LENGTH (m): 300

LAKE VOLUME (m^3): ?

TIME TO FAILURE (days): "Few days"

FAILURE MECHANISM: Overtopping

BREACH DIMENSIONS: ?

CONTROLS: Natural armoring formed in channel by boulders.

DAM MATERIALS: Dolomite, sandstone, claystone.

REFERENCES: Fullmer, 1984; R.L. Schuster, U.S. Geological Survey, unpub. data, 1986.

COMMENTS: Partial failure; lake still exists.

07/15/91

COUNTRY: United States

SUBDIVISION: Wyoming, Teton County

DATE: 1909 - 1910

RIVER OR LAKE: Gros Ventre River; Upper Slide Lake

TYPE OF LANDSLIDE: Flow, earth

TRIGGER: Snowmelt

LANDSLIDE VOLUME (m^3): ?

DAM TYPE: III

DAM HEIGHT (m): ?

DAM LENGTH (m): 1,000

DAM WIDTH (m): 3,000 - 4,000

LAKE LENGTH (m): 2,000

LAKE VOLUME (m^3): ?

TIME TO FAILURE (days): Did not fail.

FAILURE MECHANISM: ?

BREACH DIMENSIONS: ?

CONTROLS: Downcutting stopped by armoring of channel by boulders.

DAM MATERIALS: Sandstone and limestone.

REFERENCES: Blackwelder, 1912; Keefer and Love, 1956.

COMMENTS: Rapid cutting had lowered lake by 3 m by Aug. 1911. Upper Slide Lake still exists.

07/15/91

COUNTRY: United States

SUBDIVISION: Wyoming, Teton County

DATE: 1925; 6/23

RIVER OR LAKE: Gros Ventre River; Lower Slide Lake

TYPE OF LANDSLIDE: Avalanche, debris /slide, rock

TRIGGER: Snowmelt

LANDSLIDE VOLUME (m^3): 38,000,000

DAM TYPE: III

DAM HEIGHT (m): 70 - 75

DAM LENGTH (m): 600

DAM WIDTH (m): 3,000

LAKE LENGTH (m): 6,500

LAKE VOLUME (m^3): 80,000,000

TIME TO FAILURE (days): 696

FAILURE MECHANISM: Overtopping

BREACH DIMENSIONS: 15 m deep

CONTROLS: -

DAM MATERIALS: Sandstone, limestone, shale, and soil debris.

REFERENCES: Emerson, 1925; Alden, 1928; Voight, 1978.

COMMENTS: About 53,000,000 cu m of water was released by the flood; overwhelmed town of Kelly, 6 km downstream; 6 people drowned.

07/15/91

COUNTRY: United States

SUBDIVISION: Wyoming, Teton County, Grand Teton National Park

DATE: 1941; 8/9-10

RIVER OR LAKE: Cascade Creek

TYPE OF LANDSLIDE: Flow, debris

TRIGGER: Rainfall

LANDSLIDE VOLUME (m^3): ?

DAM TYPE: IV

DAM HEIGHT (m): ?

DAM LENGTH (m): ?

DAM WIDTH (m): ?

LAKE LENGTH (m): 120 (60 m wide)

LAKE VOLUME (m^3): ?

TIME TO FAILURE (days): ?

FAILURE MECHANISM: ?

BREACH DIMENSIONS: ?

CONTROLS: ?

DAM MATERIALS: ?

REFERENCES: Fryxell and Horberg, 1943.

COMMENTS: No information if dam failed; no lake shown on topographic map.

07/15/91

COUNTRY: United States

SUBDIVISION: Wyoming, Teton County, Grand Teton National Park

DATE: 1941; 8/9-10

RIVER OR LAKE: Leigh Creek

TYPE OF LANDSLIDE: Flow, debris

TRIGGER: Rainfall

LANDSLIDE VOLUME (m^3): ?

DAM TYPE: III

DAM HEIGHT (m): ?

DAM LENGTH (m): 100

DAM WIDTH (m): ?

LAKE LENGTH (m): 300 (150 m wide)

LAKE VOLUME (m^3): ?

TIME TO FAILURE (days): Did not fail.

FAILURE MECHANISM: -

BREACH DIMENSIONS: -

CONTROLS: Apparently too much rock debris.

DAM MATERIALS: Igneous rock debris.

REFERENCES: Fryxell and Horberg, 1943.

COMMENTS: Lake is still shown on topographic map.

07/15/91

COUNTRY: Yugoslavia

SUBDIVISION: Gradot Hill

DATE: 1956; 9/5

RIVER OR LAKE: Vatasha River

TYPE OF LANDSLIDE: Slump, rock and soil

TRIGGER: Undercutting

LANDSLIDE VOLUME (m^3): 20,000,000

DAM TYPE: II

DAM HEIGHT (m): 70

DAM LENGTH (m): 400

DAM WIDTH (m): 800

LAKE LENGTH (m): ?

LAKE VOLUME (m^3): ?

TIME TO FAILURE (days): Did not fail.

FAILURE MECHANISM: -

BREACH DIMENSIONS: -

CONTROLS: Spillway constructed across dam.

DAM MATERIALS: Pliocene and Pleistocene tuff, conglomerate, clay.

REFERENCES: Anagnosti, 1988.

COMMENTS: Rectangular outflow channel was constructed across landslide dam to allow safe release of water.

07/15/91

COUNTRY: Yugoslavia

SUBDIVISION: Jovatz River Valley

DATE: 1977; 2/15

RIVER OR LAKE: Jovatz River

TYPE OF LANDSLIDE: Slide, debris

TRIGGER: Rainfall

LANDSLIDE VOLUME (m^3): 200,000,000

DAM TYPE: II

DAM HEIGHT (m): 15 - 20

DAM LENGTH (m): 150

DAM WIDTH (m): 700

LAKE LENGTH (m): 2,500

LAKE VOLUME (m^3): 500,000

TIME TO FAILURE (days): Did not fail.

FAILURE MECHANISM: _

BREACH DIMENSIONS: _

CONTROLS: Small overflow cut natural spillway.

DAM MATERIALS: Marl, claystone, sandstone, siltstone debris.

REFERENCES: Anagnosti, 1988.

COMMENTS: Subsequent months were dry, small overflow of 0.3 to 0.5 cu m/s cut spillway; performed satisfactorily for 10 years since overtopping.

07/15/91

COUNTRY: Yugoslavia

SUBDIVISION: Zavoj, near Temska

DATE: 1963; 2/23-27

RIVER OR LAKE: Visotchitza River

TYPE OF LANDSLIDE: Slide, debris

TRIGGER: Snowmelt and rainfall

LANDSLIDE VOLUME (m^3): 4,000,000

DAM TYPE: II

DAM HEIGHT (m): 35

DAM LENGTH (m): 150

DAM WIDTH (m): 500

LAKE LENGTH (m): 5,000

LAKE VOLUME (m^3): 14,000,000

TIME TO FAILURE (days): Did not fail.

FAILURE MECHANISM: -

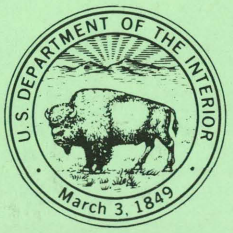
BREACH DIMENSIONS: -

CONTROLS: Spillway channel dug through dam; 2.5 m diameter diversion tunnel.

DAM MATERIALS: Quaternary clay with blocks of sandstone.

REFERENCES: Engineering News-Record, 1963; Anagnosti, 1988; B.S. Jovanovic, Civil Engineer, Belgrade, unpub. data, 1989.

COMMENTS: Zavoj under 30 m water, 3.4 km upstream. Heavy rain and snowmelt eroded through spillway. Permanent solution was diversion tunnel through abutment. New hydropower dam constructed in 1989 just upstream with toe on landslide dam.



-- DOCUMENTED HISTORICAL LANDSLIDE DAMS FROM AROUND THE WORLD --

JOHN E. COSTA AND ROBERT L. SCHUSTER

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