

# Applying Surficial Geologic Mapping to Geologic Hazards Mapping, Nez Perce County, Idaho

By Loudon R. Stanford,<sup>1</sup> Kurt L. Othberg,<sup>1</sup> Bill Reynolds,<sup>2</sup>  
and Roy M. Breckenridge<sup>1</sup> Idaho Geological Survey

<sup>1</sup>Idaho Geological Survey  
Third Floor, Morrill Hall  
University of Idaho  
Moscow, ID 83844-3014  
Telephone: (208) 885-7479  
Fax: (208) 885-5826

e-mail: stanford@uidaho.edu, roybreck@uidaho.edu, othberg@uidaho.edu

<sup>2</sup>Nez Perce County  
1230 Main street  
Lewiston, ID 83501-0896  
Telephone: (208) 750-2055  
e-mail: BillReynolds@co.nezperce.id.us

## INTRODUCTION

The Idaho Geological Survey's long-term geologic mapping plan is designed to serve the natural-resource base and the growing population of Idaho. However, utilization of geologic mapping by counties and cities has lagged even as maps have become available. During the 1990s, this underutilization began to change as more counties and cities began to use geographic information system (GIS) databases for their planning and decision making. Since 1999, the Idaho Geological Survey has coordinated new surficial geologic mapping with development of a geologic hazards component of Nez Perce County's newly implemented ArcView GIS. The Idaho Geological Survey cooperated with the commissioners and planning department of Nez Perce County to identify critical areas of need. Because of recurrent landslides, the county had retained a geotechnical consultant and was beginning to understand the utility of basic geologic mapping to planning, zoning, and permitting.

## SURFICIAL GEOLOGY

The surficial mapping used for Nez Perce County was from STATEMAP projects in the western and central parts of the county near the city of Lewiston and along the U.S. Highway 12 corridor. These areas are located in northern Idaho near the boundary between the Columbia Plateau

and the Northern Rocky Mountains. The Clearwater River valley is steep-sided and large landslides are common. The surficial geologic map shows units and symbols that characterize geomorphic processes and their potential as geologic hazards.

## GEOTECHNICAL TERRAIN UNITS

The county needs geologic mapping to help it identify geologic-hazards and locate areas that require site-specific geotechnical studies. The surficial geologic map is vital information; however, county decision makers are unable to directly translate the geologic units to practical engineering categories. The county's geotechnical contractor interpreted the engineering properties and material characteristics of the geologic units into "geotechnical terrain units" for the county. Each geotechnical terrain unit (GTU) includes a description of its capabilities for the following categories: slope, ground water, erosion, soils, earthwork, roadways, foundations, septic systems, and whether or not a site-specific study should be required.

## CONCLUSION

The collaboration by the county, its geotechnical contractor, and the Idaho Geological Survey through its STATEMAP project, was ideal in terms of timing. Because of costly damages from landslides, Nez

Perce County was prepared to make landslide hazard interpretations a priority in its budget when the Idaho Geological Survey began STATEMAP surficial geologic mapping in the area. As the survey's mapping data became available following each STATEMAP contract period, the county's geotechnical contractor interpreted the GTUs on the basis of the surficial geology, and each data set was imported into an ArcView coverage for the county planning department. The Idaho Bureau of Disaster Services and the State Mapping Advisory Committee have been supportive of this project and similar applications in other counties.

Idaho counties vary in their capability and willingness to incorporate geologic mapping and

geotechnical interpretations into their planning, zoning, and permitting procedures. The successful collaboration between the Idaho Survey and Nez Perce County is, however, serving as a model for increased utilization of geologic mapping elsewhere in Idaho.

## REFERENCES

- Howard, T. R., 2003 Geotechnical Hazard Mapping in Nez Perce County, Idaho: Unpublished mapping by the Idaho Geological Survey and Howard Consultants
- Howard, T. R., 2003 Geotechnical Hazard Mapping in Clearwater County, Idaho: Unpublished mapping by the Idaho Geological Survey and Howard Consultants