DEPARTMENT OF THE INTERIOR
U.S. GEOLOGICAL SURVEY

PROFESSIONAL PAPER 1336–B
PLATE 1

EXPLANATION

This map shows sand blow distribution and intensity on alluvium of the St. Francis Basin; relative difficulty of identifying sand blows and fissures in alluvium of the St. Francis Basin; principal inferred faults and fault zones beneath the alluvium (locations of inferred faults and fault zones from Zoback and others, 1980); and major geologic and geographic features in late Quaternary alluvium.

The portion of the map showing sand blow distribution and intensity was made by visually estimating from aerial photography (scale 1:20,000 to 1:24,000, vintage 1937 to 1941) the percentage of the land surface covered with sand vented to the surface by earthquake shaking (sand blows); numerous field verifications were made by using borings and test pits.

The red dotted rectangular areas show regions having sand blows, and the dot size is keyed to the percentage of the surface covered with sand blows. Each rectangular area conforms to the coverage of a single aerial photograph; some parts of the photograph may have a greater or lesser percentage or may be forested. Estimates were not made on photographs of areas that were greater than 50 percent forested.

The map also shows the relative difficulty of identifying 1811–12 earthquake-induced liquefaction effects of various terrains and soils. Aerial-photograph interpretation and field checking are the observation methods used. Difficulty levels are shown only for alluvium in the St. Francis Basin. Symbols for difficulty levels are shown at the end of this section.

Areas designated as impossible to extremely difficult to identify are flooded by the Mississippi River with a frequency of at least about once every five years or were very prone to flooding before man-made levees were built. The flooding has either deposited a veneer of alluvium over any liquefaction effects or else the flood waters have severely scoured or reworked soils on the surface. Area boundaries were determined primarily from information on U.S. Department of Agriculture Soil Conservation Service county soil maps and from consultations with county Soil Conservation Service representatives and farmers.

Areas designated as possible but very difficult to identify have been subjected to occasional flooding or may have many sand dunes and surface soils that are very sandy and are easily reworked by wind. In the southern part of the map, near the Mississippi River, the areas represent locations of thick backswamp deposits.

Areas designated as generally very difficult to identify have fewer sand dunes and generally very sandy surface soils and are considered to have been less prone to flooding effects than less susceptible areas.

Areas designated as more difficult than average to identify generally have surface soils that are either sandy silts or silty sands and are somewhat subject to being reworked by wind or have some mima mounds. Soil textures are so similar to sand blow material that aerial-photograph interpretation and field checking of sand blows and fissures can be made only for a very narrow range of soil-moisture conditions.

Percentage of sand blows. Dot size indicates percentage of coverage. Each rectangular area on the map corresponds to the coverage of one aerial photograph

- Greater than 25 percent
- 10 to 15 percent
- 5 to 10 percent
- 1 to 5 percent
- Mostly forested

Level of relative difficulty for identifying 1811–12 earthquake-induced liquefaction effects

- Impossible to extremely difficult
- Possible but very difficult
- Generally very difficult
- More difficult than average

Major geologic and geographic features in the late Quaternary alluvium (from Saucier, 1964)

- Meander-belt deposits laid down since 1811–12
- Holocene point-bar deposits
- Obion River point-bar deposits
- Obion River terrace deposits
- Pleistocene/Holocene braided-stream deposits
- Backswamp deposits
- Low scarp—Teeth point in direction of topographically low side

Inferred faults beneath alluvium

- Boundary of zone with many small faults
- Discrete faults
- Joints through loess

New Madrid
Paragould
Osceola
Wilson
Gilmore
MEMPHIS
JONESBORO

91° 30′ 91° 30′ 90° 30′ 89°00′
37° 15′ 37° 30′ 36° 30′ 35° 00′

Base from U.S. Geological Survey, 1:250,000
Blytheville 1970; Dyersburg 1970; Memphis 1978;
Paducah 1969; Poplar Bluff 1978

SCALE 1:500 000

10 0 10 20 30 MILES
10 0 10 20 30 40 KILOMETERS

SAND BLOW DISTRIBUTION AND INTENSITY ON ALLUVIUM OF THE ST. FRANCIS BASIN