Open-File Report 95-0574

This report is preliminary and has not been reviewed for conformity with U.S. Geological Survey editorial standards or with the North American Stratigraphic Code. Any use of trade, product, or firm names is for descriptive purposes only and does not imply endorsement by the U.S. Government.

1USGS, MS 966, Denver, CO, 80225

1995
Note for the Monthly List

Open File Report 95-574
SEISMOTECTONIC MAPS IN THE VICINITY OF NEW MADRID, MISSOURI —
DATABASE — digitally compiled by Susan Rhea

This digital map database consists of the ESRI ARC/INFO Version 7.0.3 coverages used to
generate the maps in Map Series MF-2264 A to E (Rhea and Wheeler, 1994a,b, Rhea and others,
Total database size is 4.5Mb. The database may be downloaded via 'anonymous ftp' from a USGS
data server named greenwood.cr.usgs.gov (136.177.48.5). The files are located in a directory
named /pub/open-file-reports/ofr-95-0574.
SEISMOTECTONIC MAPS IN THE VICINITY OF NEW MADRID, MISSOURI —
DATABASE

digitally compiled by

Susan Rhea

This database, identified as mf2264, has been approved for release and publication by the Director of the USGS. Although the database has been subjected to rigorous review and is substantially complete, the USGS reserves the right to revise the data pursuant to further analysis and review. Furthermore, it is released on condition that neither the USGS nor the United States Government may be held liable for any damages resulting from its authorized or unauthorized use.

The database may be downloaded via 'anonymous ftp' from a USGS data server named greenwood.cr.usgs.gov (136.177.48.5). The files are located in a directory named /pub/open-file-reports/ofr-95-0574). The database manager is:

Susan Rhea
303/273-8639
rhea@gldvxa.cr.usgs.gov
U.S. Geological Survey
Box 25046, MS 966
Denver, CO 80225

This digital map database consists of the ESRI ARC/INFO Version 7.0.3 coverages used to generate the maps in Map Series MF-2264 A to E (Rhea and Wheeler, 1994a,b, Rhea and others, 1994, Wheeler and Rhea, 1994, Wheeler and others, 1994) and I-2521 (Rhea and Wheeler, 1995). Total database size is 4.5Mb. Base-data are from 1:100,000-scale Digital Line Graph (DLG) data (roads, railroads, streams, water bodies, and state and county boundaries). Original source and scale for other data are described in the coverage entries below. All coverages contain attribute information beyond the usual ARC/INFO attributes, and some covers contain annotation subclasses. The ARC/INFO generated attributes include area and perimeter for polygon coverages, and internal control numbers and id numbers for point, arc, and polygon covers.

The projection used is Albers Equal-Area, with central meridian at 90°W, and standard parallels at 29°30' N and 45°30' N. Latitude of the projection's origin is at 23°N. The scale of the published (printed) Miscellaneous Field Maps and the Investigations Map is 1:250,000.

The EXPORT command was used to create the data.e00 files, using full compression. The IMPORT command will generate the ARC/INFO coverages for your use. I recommend importing the coverages and using the DESCRIBE command to display information on available features for each coverage.
A brief description of each coverage follows (description of reflection and refraction coverages are grouped after descriptions of more general coverages):

**2x2grat:** graticule for the map; 35-37°N, 89-91°W  
*arc attributes:* NEATCODE = 1 for yes, 0 for no  
MJRULCODE at .5° intervals  
MNRULCODE at .125° intervals  
*polygon attributes:* none

**2x2grattic:** point cover of all the .125° interval tics in the 2x2grat area  
*point attribute:* TICCODE for interior and exterior tics

**axgrav:** axial gravity anomaly (Langenheim, 1995)  
*arc attributes:* CODE = plotting symbol  
GEO = type of data, i.e. psmag = pseudomag  
*polygon attributes:* CODE = plotting symbol  
GEO = type of data, i.e. psmag = pseudomag

**basehyd:** selected hydrography, selected on the basis of significant ground-shaking or liquefaction potential.  
*arc attributes:* DLG attributes  
*annotation subclass:* anno.names (river and lake names)

**bhlin_24k:** Bootheel Lineament as observed on low-altitude photos and transferred to 1:24,000 scale topographic maps (Schweig and others 1992)  
*arc attribute:* CODE = type of lineament; R1 and R2 are less prominent, B1 and B2 are more prominent, oldstm is not a tectonic feature

**bhlin_ls:** Bootheel Lineament as observed on landsat images.

**cities:** selected cities  
*point attributes:* none  
*annotation subclass:* anno.cities

**cnty:** state and county borders in the map area  
*arc attributes:* BNDYTYPE = 1 for states and 2 for counties  
*annotation subclass:* anno.map (state and county names in map units)  
anno.states (state names only)

**enrgcen:** locations of probable subsurface ruptures of the 1811-12 earthquakes, as defined by sandblow distribution (Obermeier, 1989). Obermeier describes the zones as 'energy centers' of those earthquakes, rather than the more spatially limited concept 'epicenter'  
*arc attributes:* ID = date of earthquake assigned by Obermeier
epri: damaging earthquakes (moment magnitude ≥ 5.0) since 1811-12 as defined by
EPRI (Johnston, 1994)
point attributes: YEAR, MONTH, DAY, and MAG (magnitude)
anntation subclass: anno.shta (year as printed on Map A)
anno.date (year of earthquakes as printed on Map E)

eqk_slu: earthquakes located by the St. Louis University from July 1974 to December 1992,
Taylor and others (1991)
point attributes: all locational values and parameters as determined by the
network operator and published in their annual reports including such
items as latitude, longitude, and depth of epicenter, magnitude, RMS

faults: locations of faults identified by geologic observation
arc attributes: CODE = plotting symbol
REF = reference
annotation subclass: anno.zone (names of a few fault zones)
anno.name (named faults, direction of fault movement)

gpspts: locations of Global Positioning System monuments. There are three classes of
monuments, one a permanent system, and two deployed by universities for
graduate studies projects
point attributes: ID = identifying code
AGENCY = operator
LAT, LONG, HEIGHT = location
DECLIN = declination
COMMENTS = comments
PLOT = plot symbol
annotation subclass: anno.id (monument name/identifier)

gravstr: structures identified from gravity-field data (Langenheim, 1995)
arc attributes: CODE = plotting symbol
GEO = geological name
polygon attributes: CODE = plotting symbol
GEO = geological name
intended to be used with axgrav, intcom, and ma^str

ghanom: locations of ground-water anomalies (Brahana and Mesko, 1994)

intcom: intrusive complexes defined by aeromagnetic studies (Hildenbrand and Hendricks,
1995).

hrvpdeep: P-velocity contours for depths 5 - 14 km (Al-Shukri and Mitchell, 1987)
arc attributes: DEPTH = depth identifier, 14
VELOC = velocity
CODE = plotting symbol
hrvpshal: P-velocity contours for depths 0 - 5 km (Al-Shukri and Mitchell, 1987)
    arc attributes: DEPTH = depth identifier, 5
                   VELOC = velocity
                   CODE = plotting symbol

landslide: landslides along the Chickasaw Bluffs, mapped by Jibson and Keefer (198°) at
           1:62,500 scale
           polygon attributes: CODE = coded as in reference indicating probable cause of
                                landslide and level of certainty
           annotation subclass: anno.id (labels on selected features)

magdep: depth to magnetic basement (Hildenbrand and Hendricks, 1995)
        arc attributes: DEPTH (km below sea level) to the nearest 1/2 km
                        CODE = plotting symbol
        polygon attributes: DEPTH (km below sea level) to the nearest 1/2 km labeled
                            at 1/4 and 3/4 intervals

misspoly: polygon coverage of the Mississippi River extracted from basehyd

miscenters: Fischer and Schumm's (1995) locations of historical centerlines of the Mississippi
            River from 1765 to 1960
            arc attributes: YEAR = year for which location was determined
                            annotation subclass: anno.year

misshores: Fischer and Schumm's (1995) locations of historical shorelines of the Mississippi
           River from 1765 to 1960
           arc attributes: YEAR = year for which location was determined
                            annotation subclass: anno.year

mtstr: Reelfoot Graben structures interpreted from magnetotelluric data (Stanley and
       Rodriguez, 1992)
       arc attributes: NAME = rift margin or arch trough
                       annotation subclass: anno.line (modelling lines in map units)
                                 anno.page (same, in map units for page-size printing)

pzcon: paleozoic surface depth contours from Dart (1995)
       arc attributes: DEPTH
                       annotation subclass: anno.arch (label for the Lake County Arch)
                                 anno.label (labels on small contours)

pzconpts: control points for defining the paleozoic surface from Dart (1995)

pzsub: subcrop contacts on the paleozoic surface from Dart (1995)
       arc attributes: none
                       annotation subclass: anno.name (subcrop formation names)
                                 anno.page (same, in map units for page-size printing)
qd24k: polygons of the 1:24000 scale topographic maps in the area
  polygon attributes:  LONG, LAT at center of quad
                      NAME
                      STATE

railrds: railroads on the 100k DLG's
  arc attributes:  defined by National Mapping Division

rds: class 1 and 2 roads (major 4-lane and principle 2-lane roads)
  arc attributes:  defined by National Mapping Division

reflstr: structures identified in seismic reflection research; NOTE: one fault, unnumbered, trending southwest-northeast approximately 10km northwest of New Madrid (Zoback and others, 1980), was left off MF-2264-D and I-2521 but is included in this database
  polygon attributes:  NAME = Blytheville arch (this is the only polygon)
                      GEO = arch or 6 letters of fault name
                      CODE = plotting symbol
                      REF = reference of publication showing feature
  annotation subclass:  anno.fault (named faults, in map units)
                        anno.line (Blytheville Arch, in map units)
                        anno.page (same, in units for page-size printing)

riv anom: river anomalies throughout the New Madrid region identified by Fischer and Schumm (1995)
  arc attributes:  DRAW = plotting index
  polygon attributes:  INSIDE = plotting index
  annotation subclass:  anno.code (index to table on MF-2264-E)
                        anno.orange (same as code, symbol for orange text)

sblows: outlines of Obermeier's (1989) definitions of areas covered by greater than 1% and greater than 25% sandblows from the 1811-12 earthquakes
  polygon attributes:  CODE = 1 or 25 to correspond with respective areas

selwell: selected wells from Dart (1992)
  point attributes:  described in Dart (1992) and include, for example, location, owner, id, depth to various formations, and thickness of various formations
  annotation subclass:  anno.id (four character well id)

sfcstr: significant structures visible at the surface in the vicinity of New Madrid
  polygon attributes:  NAME = Lake County uplift, Crowleys Ridge, Fidgely Ridge, Sikeston Ridge, and Tiptonville Dome
  annotation subclass:  anno.names (same as polygon names)
                        anno.embay (Mississippi Embayment text only)
seissta: locations of seismograph stations that have operated in the New Madrid region since July 1974
  point attributes: location coordinates, station name, start date, and stop date if available.

states: arcs from cnty with bndtype = 1; see cnty for description
  annotation subclass: anno.states (state names)

stresspts: stress orientations either from borehole breakouts or earthquake focal mechanism solutions updated in Ellis (1994)
  point attributes: $\text{ANGLE} = 360^\circ$ - stress direction; needed for plotting the stress symbol in the correct direction
    DIRECTION
    TYPE = b for borehole, e = earthquake
    QUALITY = Zoback and Zoback (1989) rating
    MARK = plotting symbol
    LAT, LONG = location
    FOCMECH = plotting symbol

strmot: strong motion seismometers
  point attributes: NAME, OWNER, CITY (nearest), and STATE

trench: trenches examined for prehistoric earthquakes and a report has been published
  point attributes: ID = identifying code
    REF = reference abbreviation
  annotation subclass: anno.id

well: wells from Dart (1992) in the map area. See selwell for wells used in MF-2264
  point attributes: described in Dart (1992) and include, for example, location, owner, id, depth to various formations, and thickness of various formations

Discussion of reflection and refraction coverages (see MF-2264-C for references and locations of surveys):

2x2cocorp: COCORP lines in map area
  arc attributes: LINE = line number or name
  annotation subclass: anno.line

cocorp: same as 2x2cocorp, except ends of lines extend outside New Madrid area

rivrefl: airgun survey of Mississippi River from north of Hickman to south of Osceola
  point attributes: MILE = river mile number
    SHPT = shotpoint number
    SHPT500 = code for every 500th shpt
    WRITE = plotting code
sexton80: 1978 - 1986 shallow seismic reflection surveys by Sexton; lines included are: AMI, JL1, JL2, LDC1, LDC2, T6-2, CWG-1

point attributes:
- LINE = line name or number
- ORIENT = orientation for line labeling, 90 for vertical labels on east-west lines, 0 for horizontal labels on north-south lines

annotation subclass:
- anno.line
- anno.page (pagesize annotation, larger than ‘line’)
- anno.black (black text symbol instead of red)

sexton90: 1990 shallow seismic reflection surveys by Sexton; lines included are: C1, S1, K1, K2, K3, NM1, B1, B2, B3

point attributes:
- LINE = line name or number
- ORIENT = orientation for line labeling, 90 for vertical labels on east-west lines, 0 for horizontal labels on north-south lines

annotation subclass:
- anno.line
- anno.page (pagesize annotation, larger than ‘line’)
- anno.black (black text symbol instead of red)

sosie82: 1982 shallow seismic reflection surveys by USGS; lines included are: 101, 201, 301, 401, 601, 801, 1001, 1101, 1201, 1401, 1601

arc attributes:
- LINE = line number

annotation subclass:
- anno.line
- anno.black (black text symbol instead of red)

sosie90: 1990 shallow seismic reflection surveys by USGS; lines included are: BS-1 thru 9, GL-1 thru 9 and 11 thru 17

point attributes:
- LINE = line name or number
- SOSIE90-ID = shotpoint number

arc attributes:
- LINE = line name or number

annotation subclass:
- anno.line
- anno.black (black text symbol instead of red)

sosie91: 1991 shallow seismic reflection surveys by USGS; lines included are: JC-1, B-25, LK-1, LK-3, BS-10,11,12,13, RV-1 thru 12, GL-19,20,21,22,23,24,25,26,27,28 thru 34

point attributes:
- LINE = line name or number
- SOSIE90-ID = shotpoint number

arc attributes:
- LINE = line name or number

annotation subclass:
- anno.line
- anno.black (black text symbol instead of red)

usgs83: 1983 refraction survey

arc attributes:
- REF = reference

point attributes:
- LONG, LAT, STA = endpoints of modeling lines
usgs83_2x2: clip of usgs83
  annotation subclass: anno.shpt
  anno.black (black text symbol instead of red)

usgs91: 1991 refraction survey
  arc attributes: REF = reference
  point attributes: LONG, LAT, SHPT, ELEV - endpoints of modeling lines
  LINE = modelling line identifier

usgs91_2x2: clip of usgs91
  annotation subclass: anno.shpt
  anno.black (black text symbol instead of red)

usgs91_rec: 1991 refraction survey receiver locations
  point attributes: SHPT = shotpoint number
  LINE = line number
  X-COORD, Y-COORD = long, lat of shotpoint

vib76: 1976 vibroseis surveys by USGS; lines included are: T1, T2, T3, T4, T5, T6, T7, R1
  point attributes: LINE = line number
  VIB76-ID = shotpoint number
  arc attributes: LINE = line number
  annotation subclass: anno.id (line number, bold symbol)
  anno.small (same, size for page-size printing)
  anno.line (same, regular text symbol)

vib78: 1976 vibroseis survey by USGS; lines included are: D1, D2, D3, S1 thru S13
  point attributes: LINE = line label
  SHPT = shotpoint number
  ORIENT = line orientation; east-west or north-south
  arc attributes: LINE = line label
  annotation subclass: anno.line

vib78_2x2: clip of vib78

vib83pub: 1983 purchase of industry vibroseis lines by USGS; lines included are: K, L, M, O, Q, R, S, T, U, V, W, AA, BB, CC, DD, GG
  point attributes: LINECODE = line label
  SHPT = shotpoint number
  ORIENT = line orientation; east-west or north-south
  arc attributes: LINECODE = line label
  annotation subclass: anno.coded
**vib90pub:** 1990 purchase of industry vibroseis lines by USGS; lines included are: A, B, C, D, E, F, G, H, X, Y, Z, EE, FF

- **point attributes:**
  - LINECODE = line label
  - SHPT = shotpoint number
  - ORIENT= line orientation; east-west or north-south

- **arc attributes:**
  - LINECODE = line label

- **annotation subclass:** anno.coded

**vib91pub:** 1991 purchase of industry vibroseis lines by USGS; lines included are: I, J, N, P

- **point attributes:**
  - LINECODE = line label
  - SHPT = shotpoint number
  - ORIENT= line orientation; east-west or north-south

- **arc attributes:**
  - LINECODE = line label

- **annotation subclass:** anno.coded
REFERENCES


____ 1994b, Map showing locations of geophysical survey and modeling lines in the vicinity of


