

Degradation of Hydrologic Connectivity along Large U.S. Lowland Rivers by Floodplain Embankment

**Land Degradation in Diverse Environments:
Meeting of IGU – COMLAND
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Large lowland river valleys

- **unique and distinctive environments**
- **perform many roles and ecosystem services**
- **habitat, floodwater storage, biogeochemical cycling, sediment budget, etc..**
- **Flood pulse (lateral hydrologic connectivity)**
 - **Key physical control on lowland floodplains**



Dikes:

- International phenomenon and time eternal
- Part of the *anthropogenic environment*
- Results in a **fundamental** change in floodplain processes
- New research on impact of dikes on the environment, but...
 - how fragmented are large lowland rivers?
 - How to quantify impact on floodplain processes? (requires an index)



Methods

- **Identify embanked reaches along large lowland rivers (U.S.)**
- **List of basins/ivers**
- **compare areas of floodplain;**
 - **no dikes,**
 - **between dikes,**
 - **outside of dikes (between dikes and valley wall)**

Data sets:

- **U.S. National Levee Database**
 - **Federal levees managed by U.S. Army Corp of Engineers**
- **U.S.G.S. Topographic maps**
- **Google Earth Pro**
- **Government documents and reports**

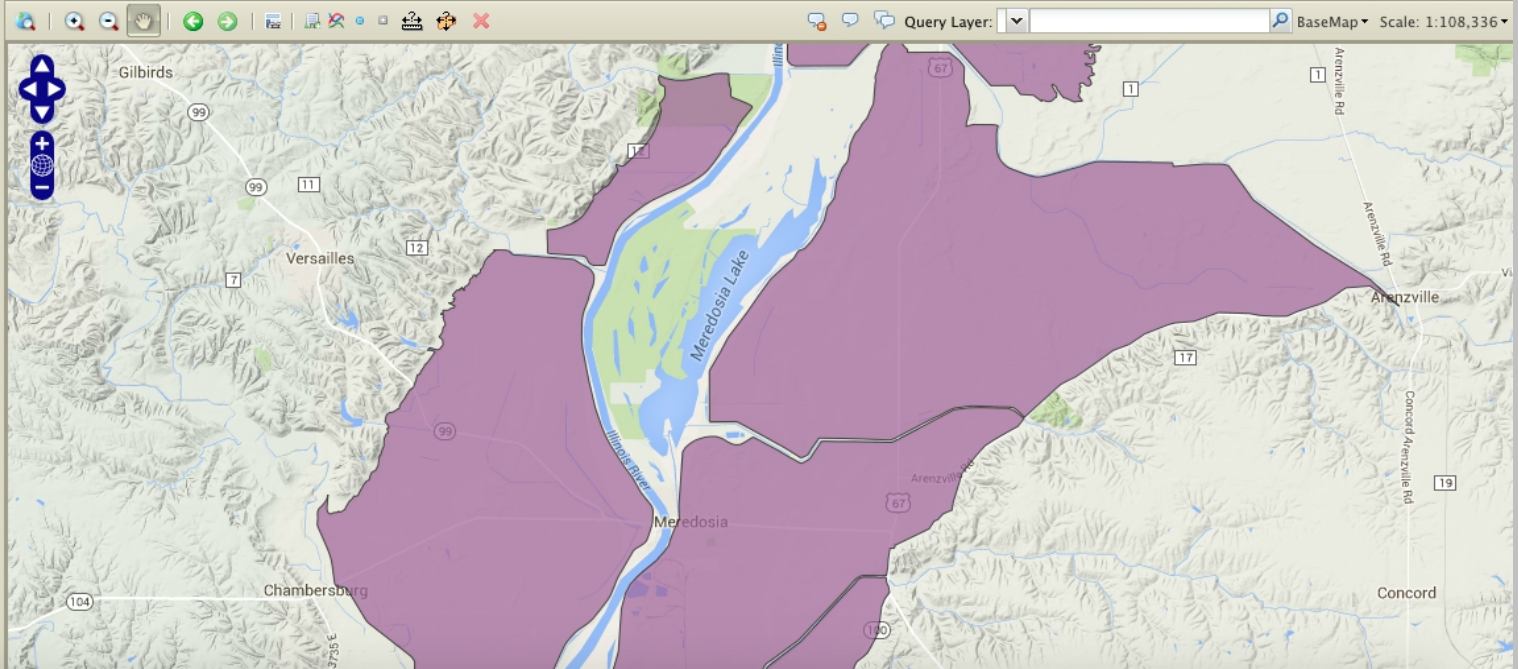


National Levee Database - Interactive Map

Layers

Find a Layer

- ▶ NLD
- ▶ USACE Civil Works
- ▶ ESRI ArcOnline Services
- ▶ Real Time Weather
- ▶ Precipitation Accumulation
- ▶ FEMA
- ▶ Federal
- ▶ Non-Federal
- ▶ Imagery
- ▶ NRCS Web Services
- ▶ US FWS Web Services
- ▶ EPA Web Services
- ▶ USGS Web Services

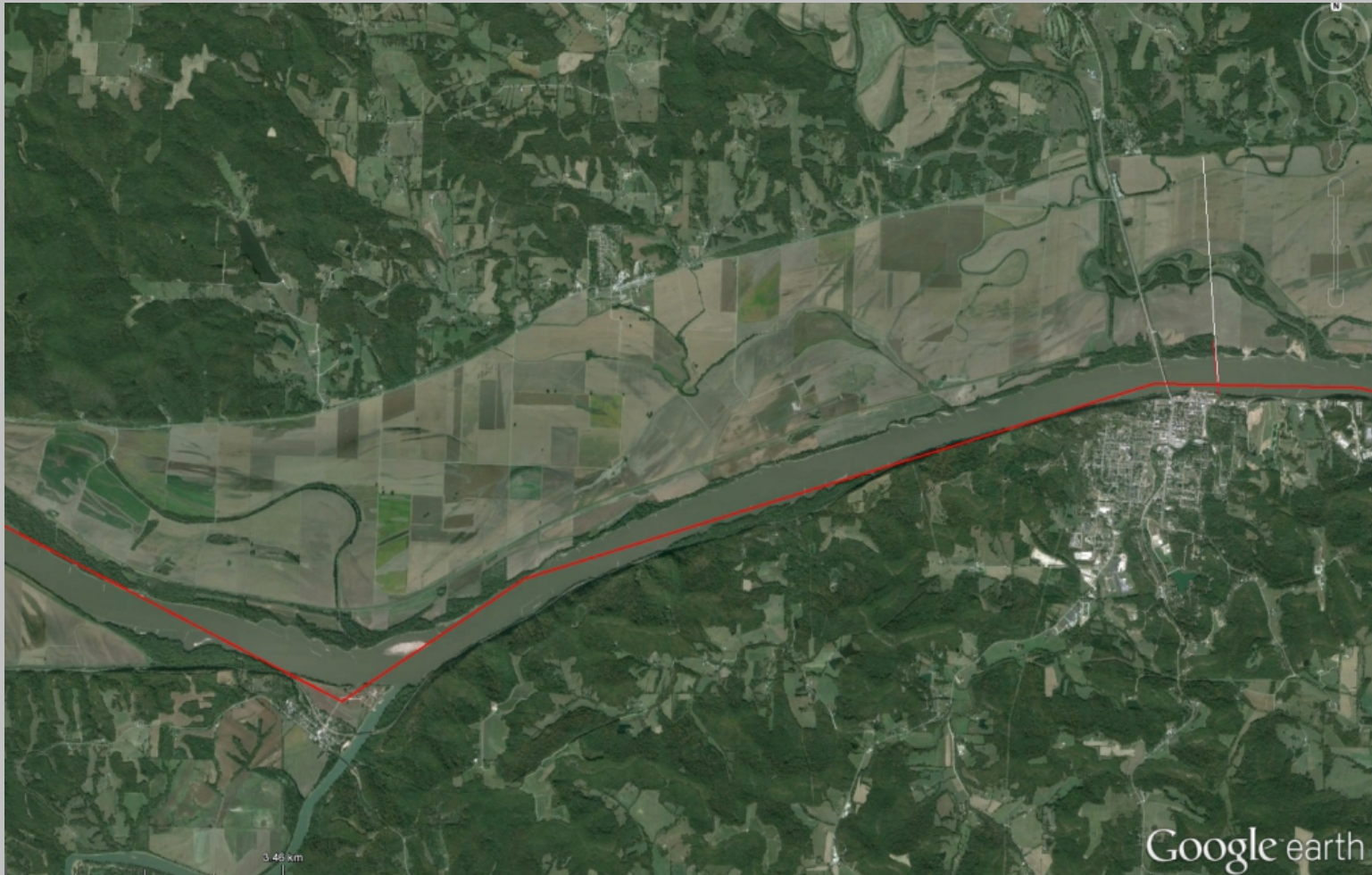


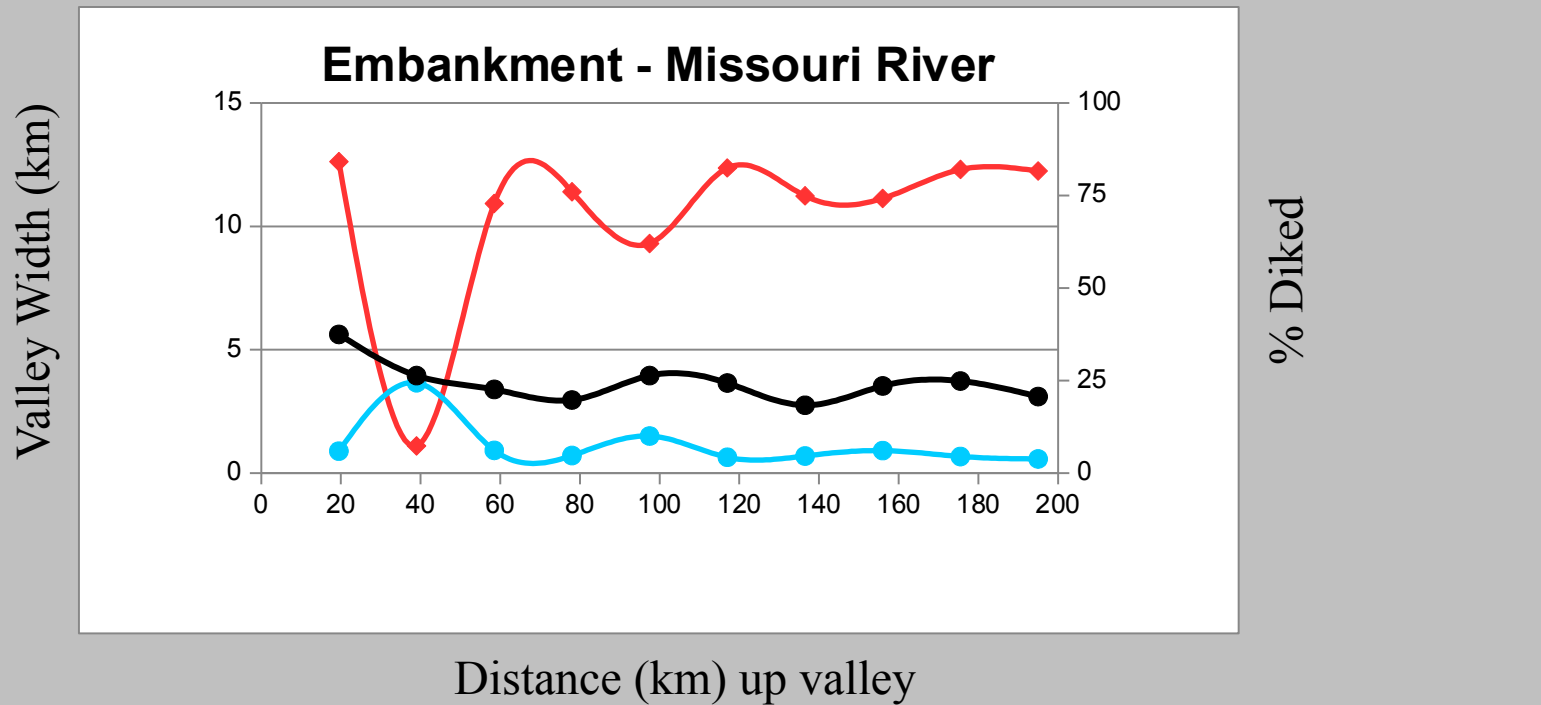
U.S. National Levee Database

Lower Mississippi River Valley (near Vicksburg, MS)



Missouri River Valley (downstream of Herman, MO)

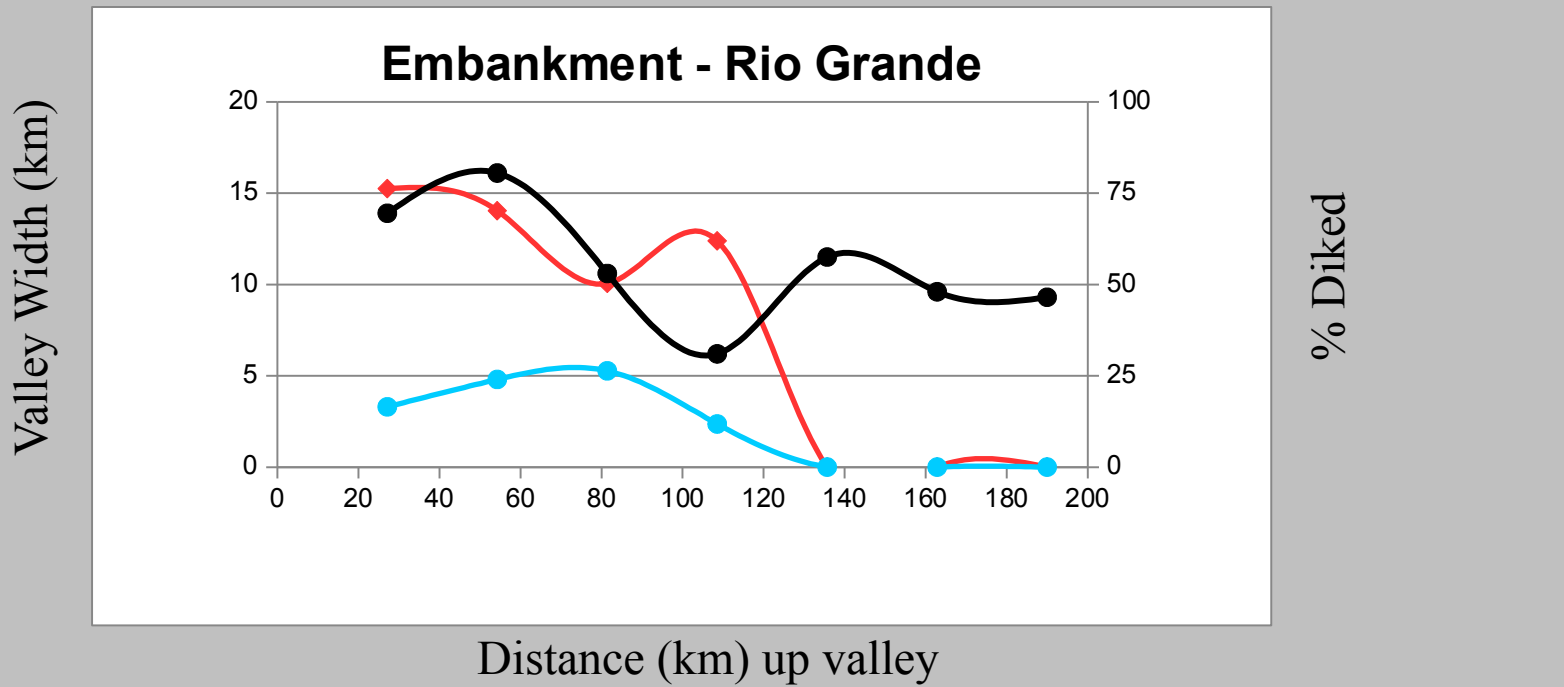




- Original
- Embanked fp
- ◆ % diked

Lower Rio Grande valley





- Original
- Embanked fp
- % diked

Index of Floodplain Embankment for Large U.S. Lowland Floodplains

- % “natural” floodplain disconnected from hydrologic connectivity

