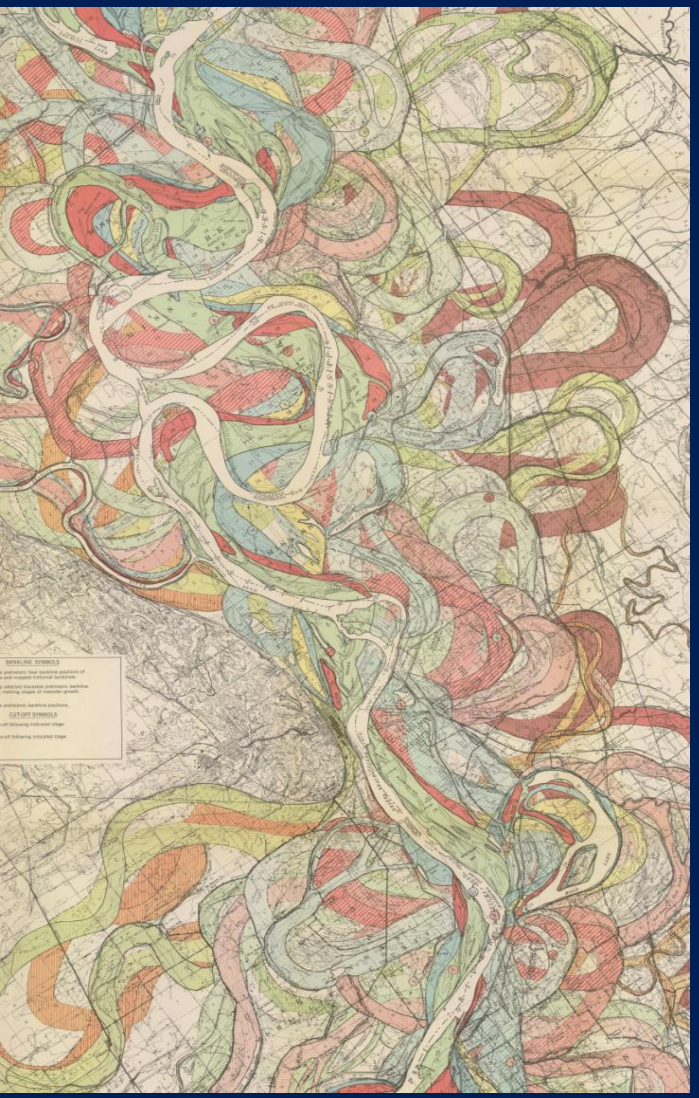
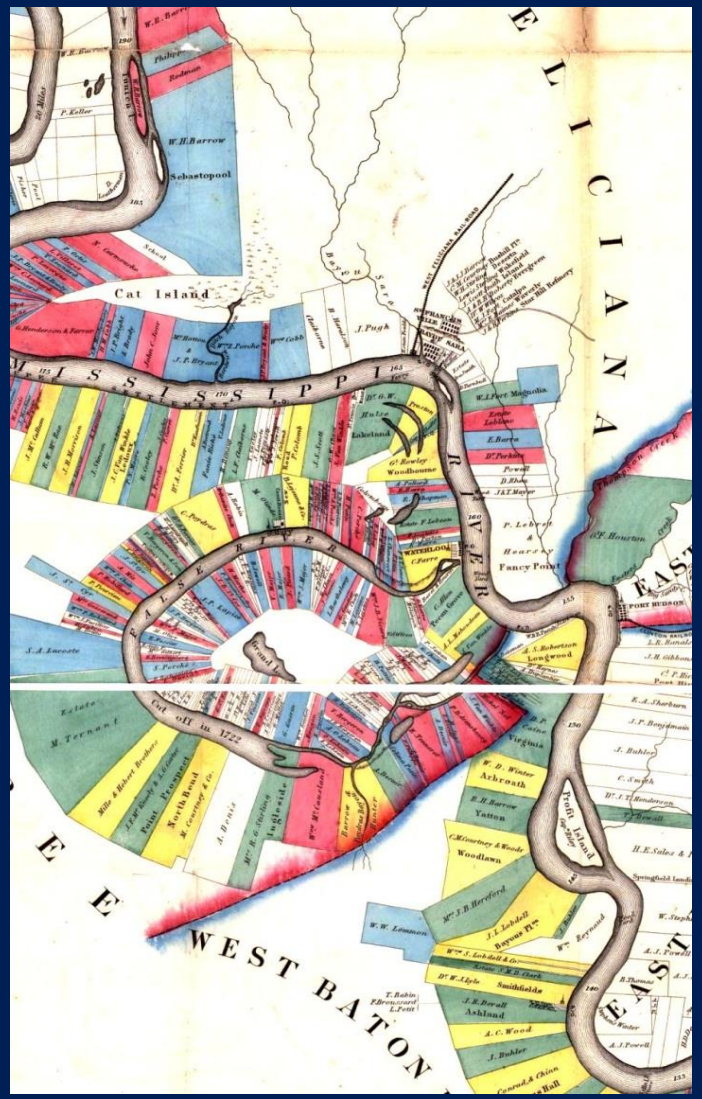
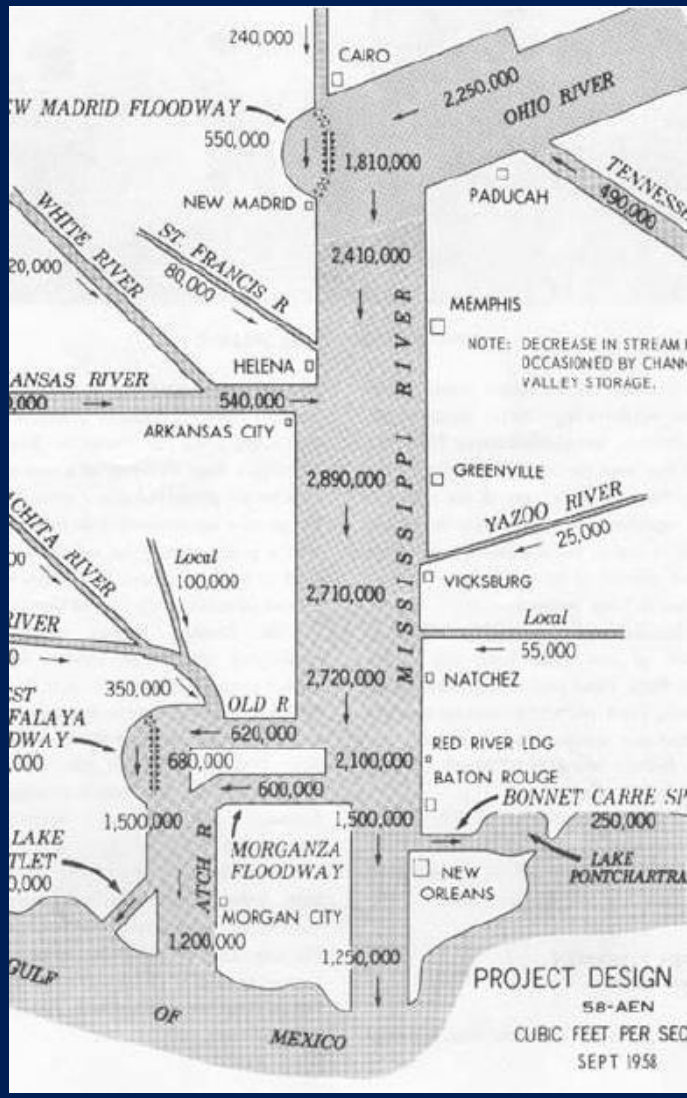
Three visions of the Mississippi River



Ecological



Settlement



Infrastructural

Systems Analysis:

Hierarchical scale of interacting subsystems from the free services of nature to the commerce of regional, national and global economies (agriculture, navigation, energy industries, fisheries, recreation, mining).

Focus on critical infrastructure, interactions and feedbacks that have evolved over human decisions on how to design land use and river engineering to support economic development.

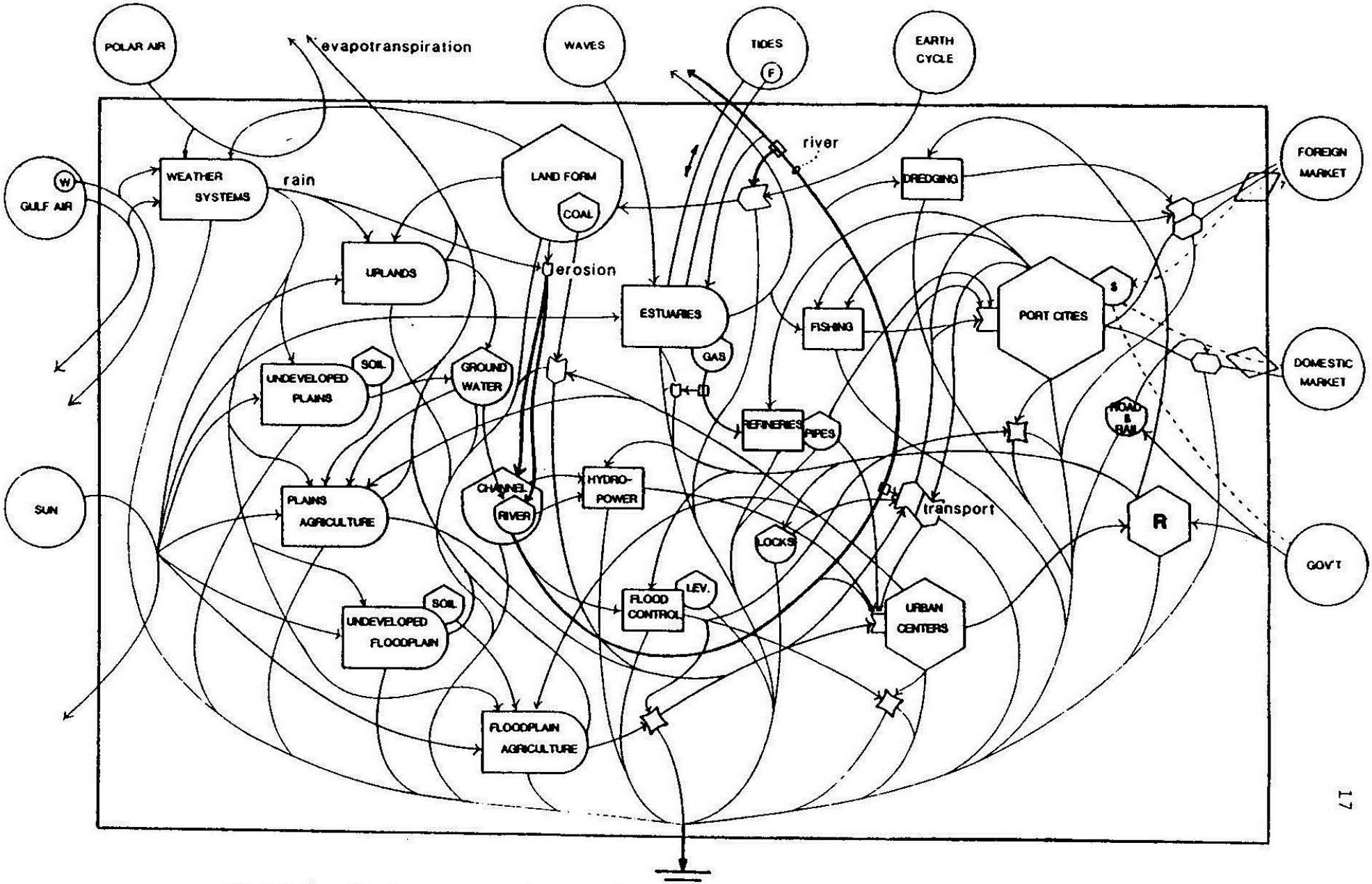
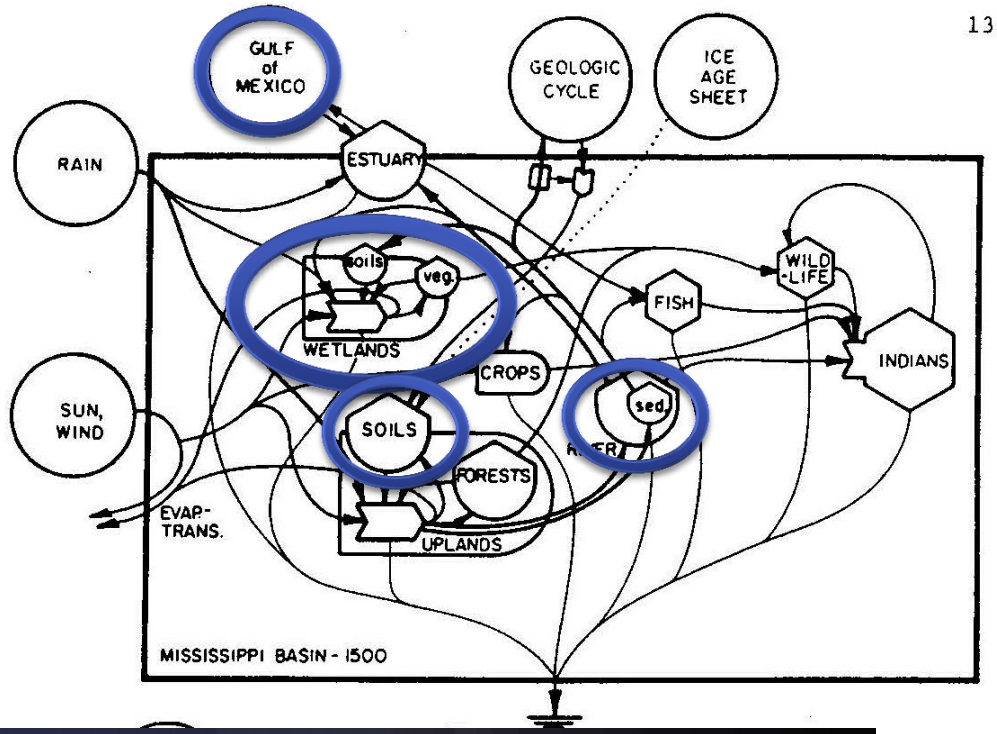
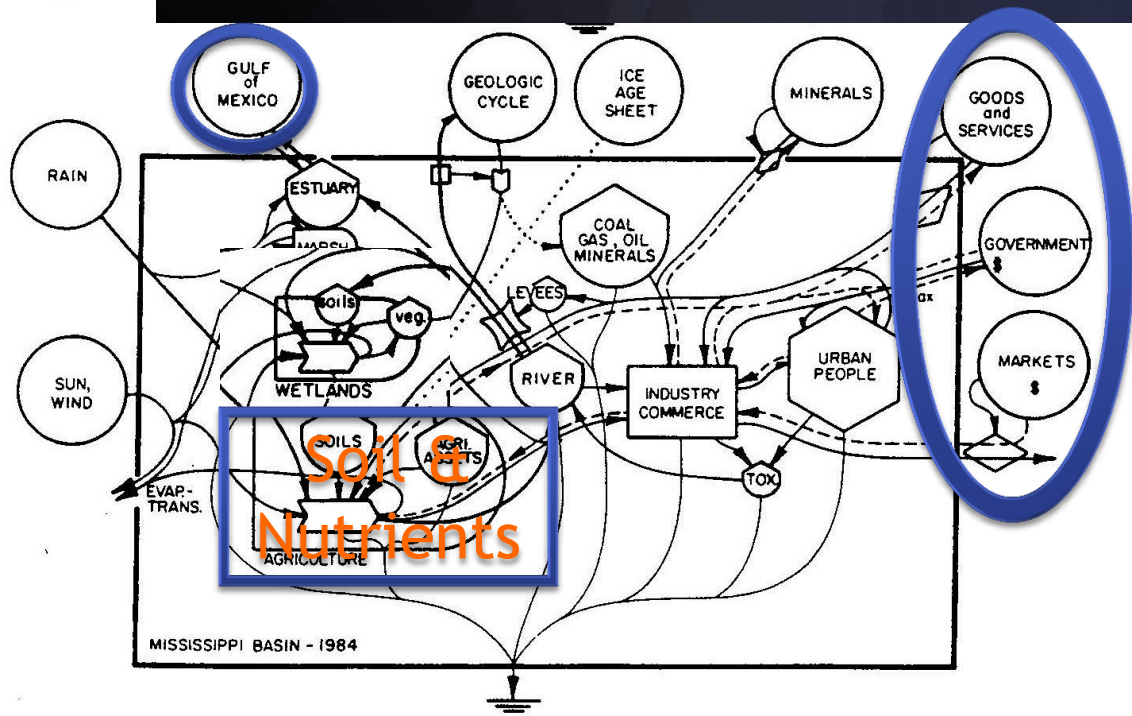


Figure 6. Complex energy diagram of the modern system of the Mississippi Basin. R, river management agencies; W, water vapor.


GULF of MEXICO
GEOLOGIC CYCLE
ICE AGE SHEET
RAIN
ESTUARY
soils
veg.
WETLANDS
FISH
WILD -LIFE
INDIANS
CROPS
SUN, WIND
SOILS
sed.
FORESTS
EVAP-TRANS.
UPLANDS
MISSISSIPPI BASIN - 1500


GULF of MEXICO
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veg.
SUN, WIND
WETLANDS
RIVER
INDUSTRY COMMERCE
URBAN PEOPLE
MARKETS $
SOILS
TOX
EVAP-TRANS.
AGRICULTURE
Soil &
Nutrients
MISSISSIPPI BASIN - 1984

Scale of Changes and Risks

1. Global economy - linkages of global commerce to continental commodities

2. Basin resources - distribution of water, sediment, floodplain, nutrients, agriculture, flood pulse

3. Urban resources and risks - cities and human settlement that require city services; upstream and downstream conflicts,

4. Climate change - water resources, soil moisture, sea level rise

1. Capture value of flood plains (alluvial and deltaic) with controlled flood-pulse designs to rebuild the ecosystem services of floodplains including flood storage, nutrient reductions, carbon sequestration, recreation and wildlife, soil conservation

2. Place premium value on soil & sediment both in upper and lower alluvial valleys and downstream to the deltaic floodplain. Reduce the waste of soil resources to the ocean.

3. Focus human settlement to allow ecosystem services to support economic development and reduce flood risk with a balance of river levees and outlets.

4. Navigation and agriculture interests need to reinvest in river infrastructure that will give the river room to reconnect with flood plains and multiple outlets that in long term will reduce maintenance cost in next century by using nature to support operations.

5. Future costs of energy related subsidies to regional economies will be amplified by uncertainties of climate change (fertilizer, flood protection, commerce transportation, human services from critical infrastructure) will require greater value placed on diverse natural resources and services unique to large river basins. The United States is very fortunate to have such a unique geologic and hydrologic system to support national economies given uncertain future conditions of energy and climate. The Nation needs to focus on reinvestments today in critical infrastructure that promotes linkages in water, energy and soil conservation that values services of uplands and floodplains.

6. Soil & sediment resource management must link sources and sinks from the catchment to the coast. The need to fill the accommodation space of deltaic coast can no longer be ignored. The nation must value upstream sediment sources to be deposited as sinks in the delta zone to do work for human systems. The work of sediment downstream has to be placed in equal terms to value of soil to do work in agricultural and restored flood plains upstream in alluvial valley. Tradeoffs upstream that do not compensate for system maintenance downstream can no longer be tolerated in all river basins in future.

7. The ecosystem resources that support unique migratory patterns of waterfowl and fisheries are by products of habitat that can only survive when the sediment and soil conservation and deposition patterns that occur in source and sink systems of major river basins are conserved. Soil conservation generates habitat from catchment to coast that concentrates biomass of birds and fisheries unique to deltaic environments. Future uncertainties in climate change, river management, along with new incentives in agriculture management must place value of these biological resources in coastal zone that are linked to wetland habitats upstream and ocean habitats downstream.

Conclusions

The Nation has made major public work investments in the Mississippi River Basin that has generated a significant portion of our present wealth.

The alternative designs that promoted sediment management and floodplain conservation as part of a connected system that could contribute to reduction of flooding risks and nutrient reductions to the Gulf need to be embraced in future visions.

The Great Rivers Partnership

Great Rivers That Work for People and Nature

Learn more about sustainable management of the world's great rivers.

America's Great Watershed Initiative

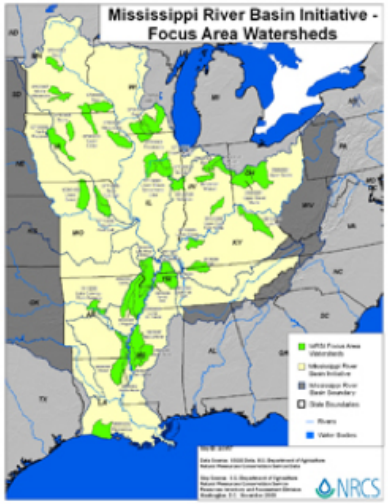
America's Great Watershed Initiative (AGWI) is a collaboration that seeks solutions for meeting the multiple demands placed on the vast and complex Mississippi watershed system by integrating issues, partners and ideas at the full watershed scale.

AGWI seeks to build and implement a vision based on collaboration and mutually beneficial outcomes in contrast to single purpose advocacy. It builds upon strong leadership present in many tributary watersheds.

AGWI Call to Action (345KB, pdf)

For a deeper look at AGWI's objectives, and a review of the 'state of the Mississippi watershed,' download this fact sheet.

Mississippi River Basin Healthy Watersheds Initiative Maps and List of Watershed



Forty-one watersheds in the 12 **Mississippi River Basin Initiative (MRBI)** states known as Focus Areas were selected by NRCS State Conservationists based on potential for avoiding, controlling, and trapping nutrients and improving water quality in selected watersheds within the Mississippi River Basin. The Focus Areas were selected based on input from conservation partners, including participants in State Technical Committees and state agencies with water quality responsibilities using the best available data at the state level.

MRBI projects will be selected from smaller watersheds within Focus Areas through a competitive process under the **Cooperative Conservation Partnership Initiative** (CCPI) leveraging partner contributions and accelerating conservation assistance to achieve MRBI objectives. Additional programs and funding will be available to support CCPI funded projects, including the Wetlands Reserve Enhancement Program and **Conservation Innovation Grants**.

Measuring Mass Flux

The choice of measuring mass flux (the amount of material that passes a set point) as the primary objective in the NASQAN program requires a relatively high sampling frequency. Additionally, the emphasis on flux characterization dictates that more samples must be collected during periods of higher streamflow.

The flux-based approach allows for the treatment of a river network as an integrated system. This approach provides data to describe and compare yields of non-point source contaminants across large regional basins, calculate loads to receiving waters, including off-continent flux, and test regional models of the influence of land use on water quality.

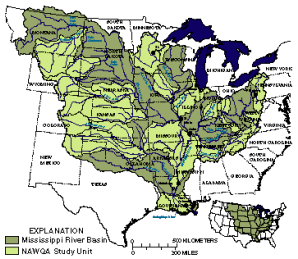


Figure 1. The Mississippi River Basin and the location of NAWQA study units.

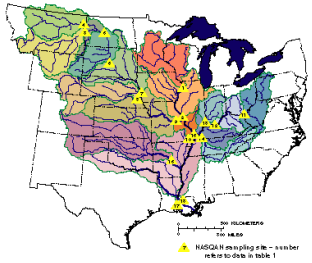


Figure 2. Subbasins defined by NASQAN stations

Mississippi River Corridor

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Our Mission

We work to identify, conserve and interpret the region's natural, cultural and scenic resources to improve the quality of life and prosperity in West Tennessee.

We will celebrate and conserve the unique natural beauty and rich history of the wilderness, recreation lands, working farms and forests, parks, and wildlife habitat in the 650,000-acre area from the River to the famous Chickasaw Bluffs. Corridor landowners and neighbors will become partners in our goal to conserve the best through voluntary conservation of land.

Landscape Conservation Cooperatives

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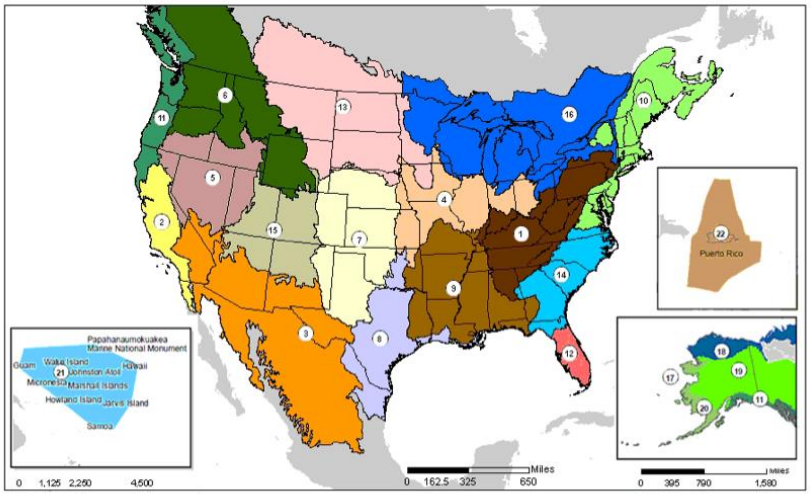
Secretarial Order No. 3289 establishes Landscape Conservation Cooperatives (LCCs), a network of public-private partnerships that provide shared science to ensure the sustainability of America's land, water, wildlife and cultural resources.



1. Appalachian
2. California
3. Desert
4. Eastern Tallgrass Prairie and Big Rivers
5. Great Basin
6. Great Northern
7. Great Plains
8. Gulf Coast Prairie
9. Gulf Coastal Plains and Ozarks
10. North Atlantic
11. North Pacific
12. Peninsular Florida
13. Plains and Prairie Potholes
14. South Atlantic
15. Southern Rockies
16. Upper Midwest and Great Lakes
17. Aleutian and Bering Sea Islands
18. Arctic
19. Northwestern Interior Forest
20. Western Alaska
21. Pacific Islands
22. Caribbean
Undassified

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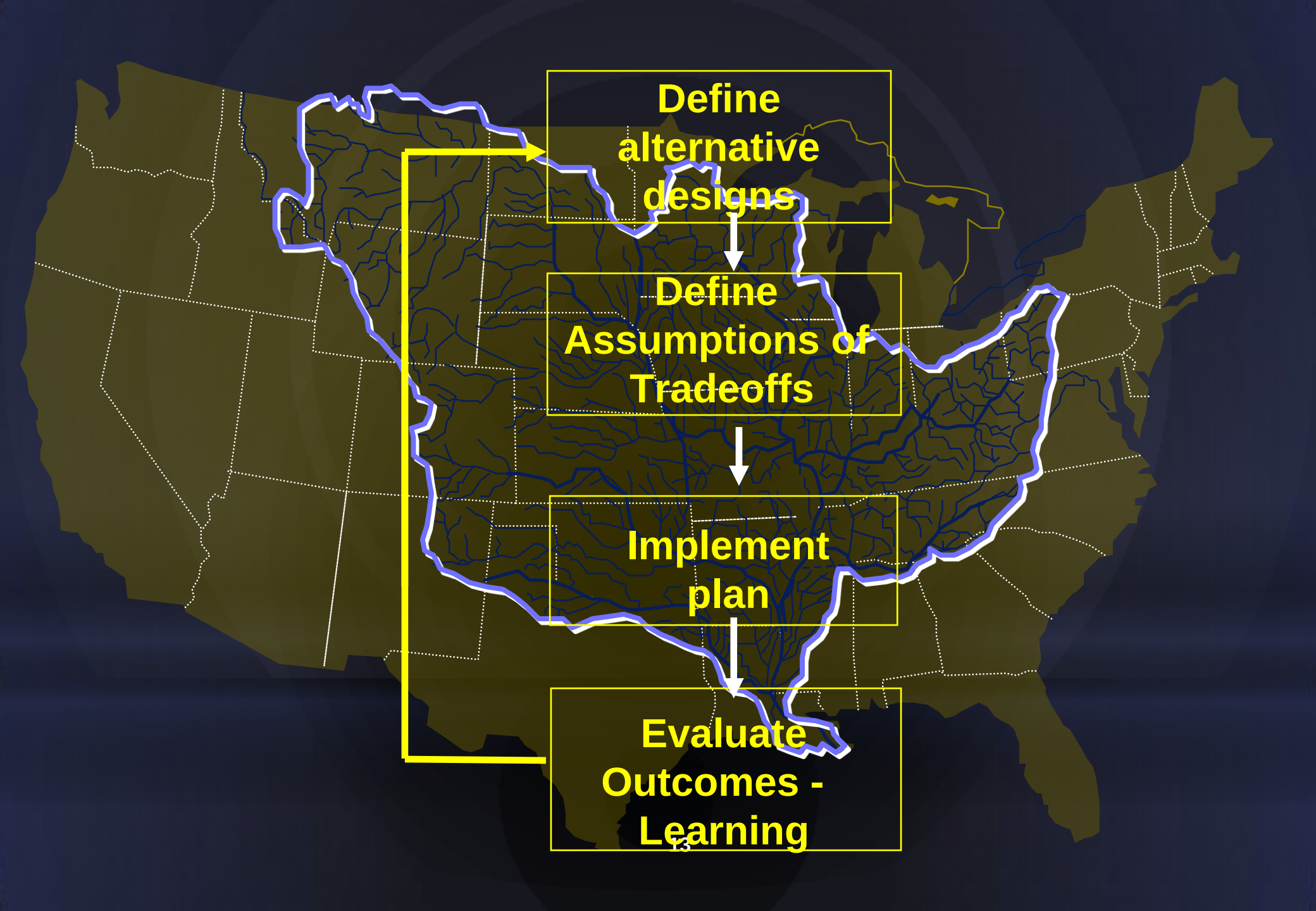
Define alternative designs
Define Assumptions of Tradeoffs
Implement plan
Evaluate Outcomes - Learning