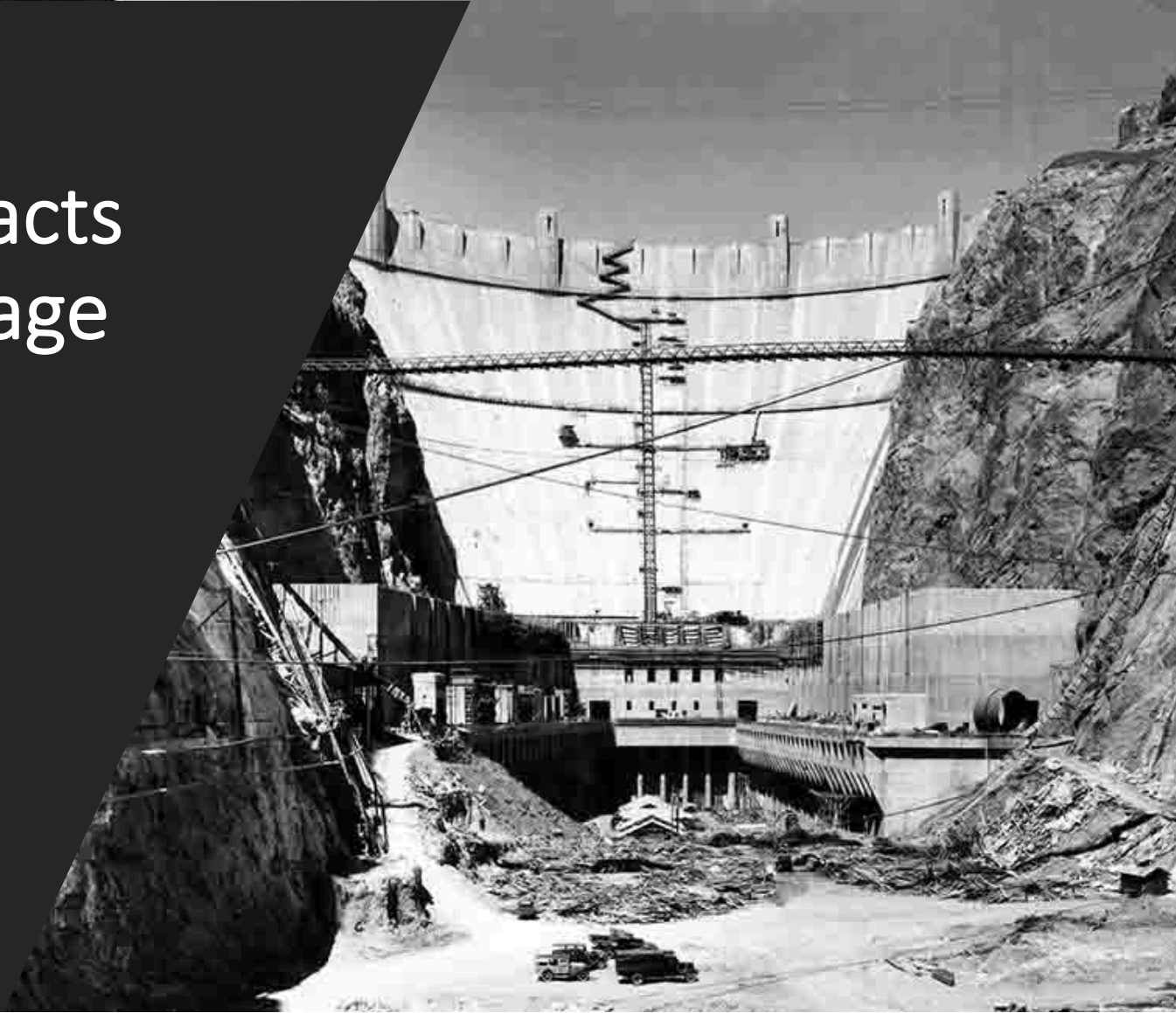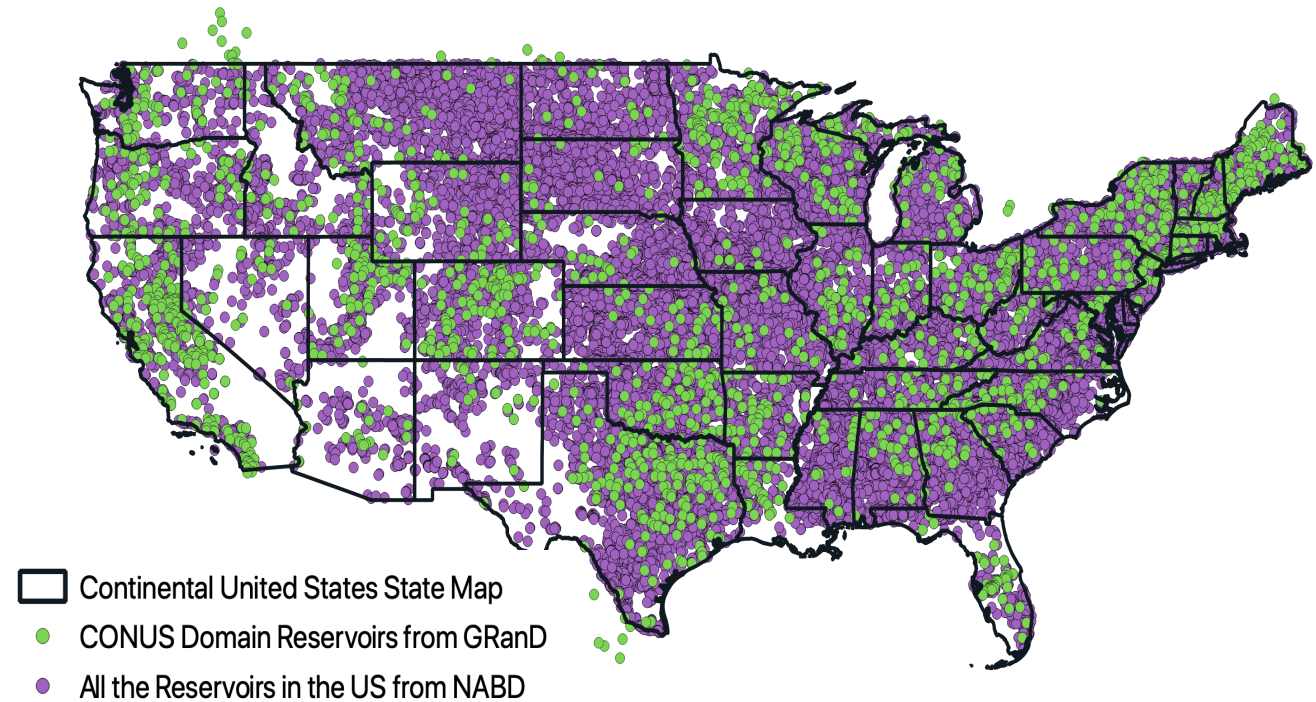# Evaluating Historical Impacts of Surface Reservoir Storage on Catchment Memory Across the US

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Within the contiguous US there are roughly 2,000 large dams and 91,000 total structures

- **National Inventory of Dams (NID)**
  - 91,000 structures in the US
  - Total storage in the US: 2,000,000 MCM

- **National Anthropological Barriers Dataset (NABD)**
  - Cleaned up version of NID
  - 52,254 entries
  - Total storage in the US: 600,000 MCM

- **Global Reservoirs and Dams (GRanD)**
  - Global database using ICOLD standards
  - Including only large reservoirs
  - 1,906 entries for US
 - Total storage in the US: 800,000 MCM

□ Continental United States State Map
● CONUS Domain Reservoirs from GRanD
● All the Reservoirs in the US from NABD

Reservoirs are constructed for many purposes across the country, and this influences operations
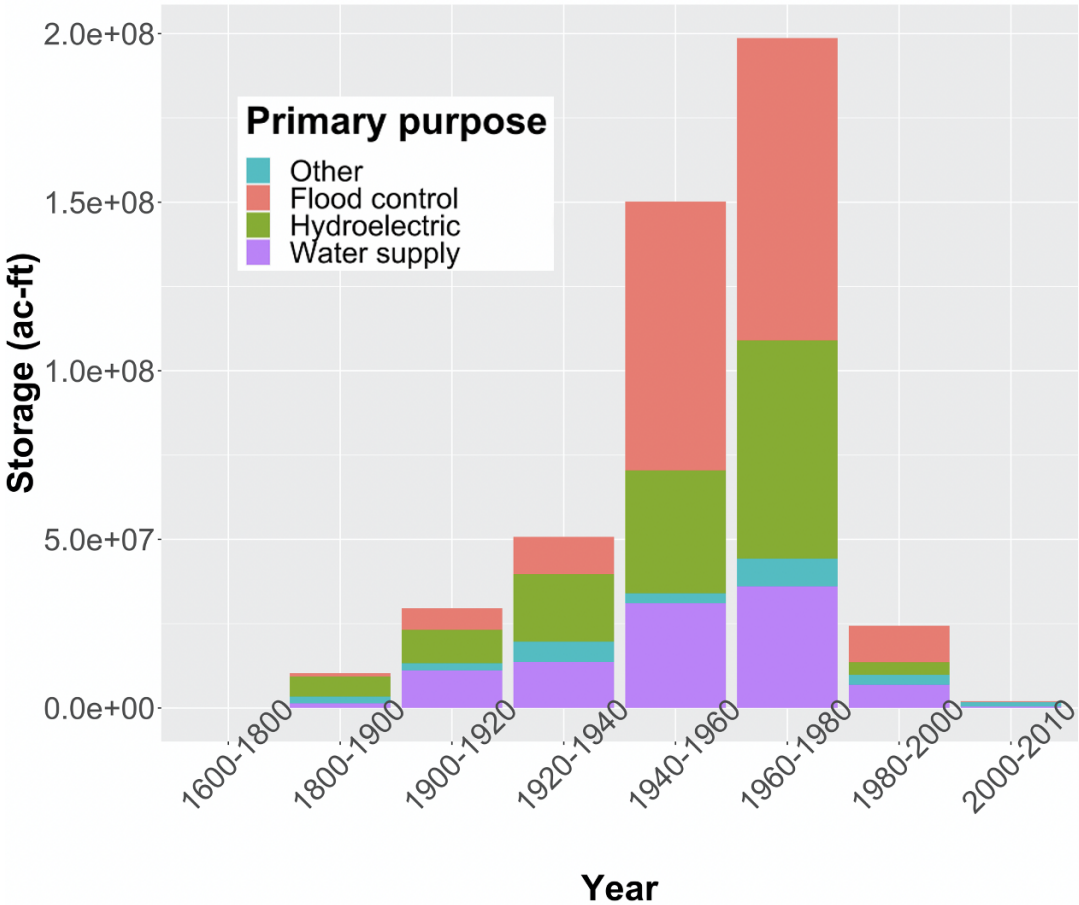
Storage Classification	Storage purposes (NID codes)
Flood control	Debris control (D), Flood control(C), Grade stabilization(G), Navigation(N), Tailings(T)
Water Supply	Fish and Wildlife pond(F), Irrigation(I), Fire Protection/ Stock Pond(P), Water Supply(S)
Hydroelectric	Hydroelectric(H)
Other	E(unidentified), Blank(NA), Other(O), Recreation(R)

Flood control is most important in eastern US while water supply and hydroelectric are more important in the west, but most reservoirs serve multiple purposes
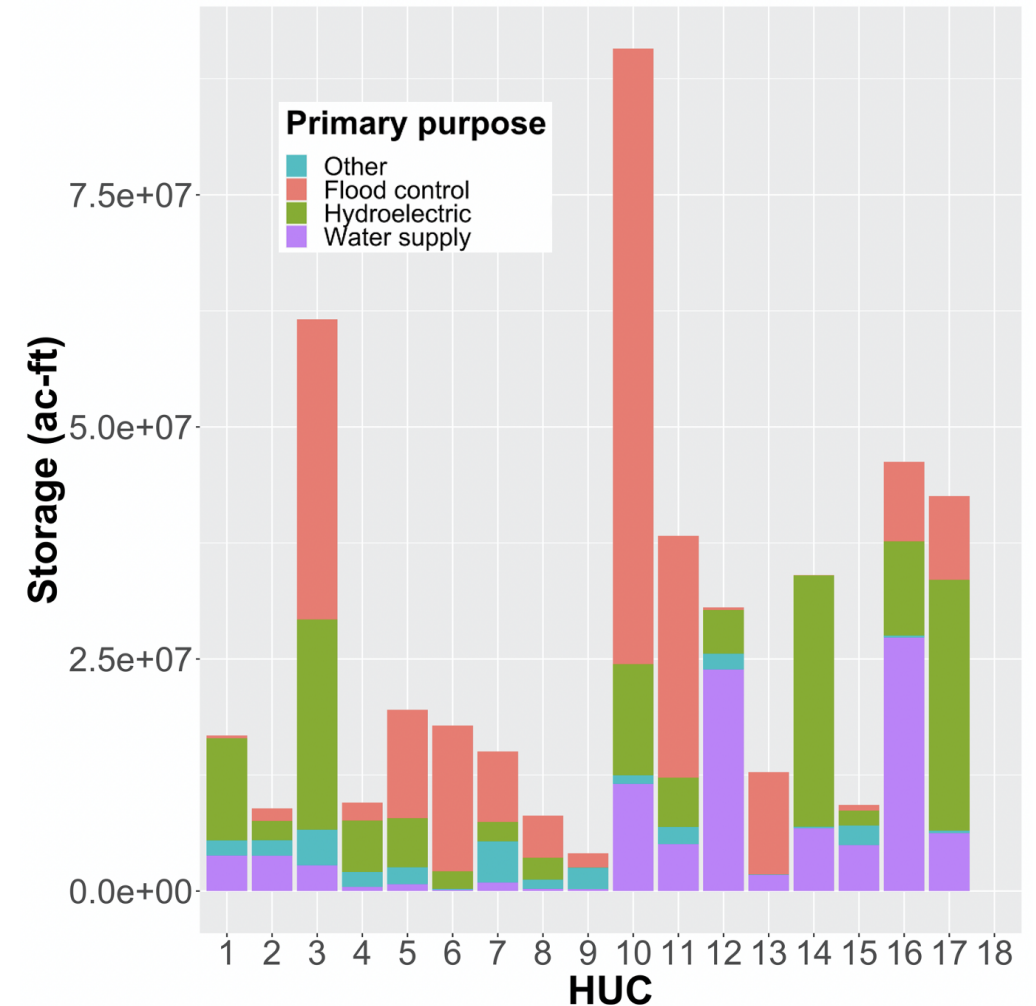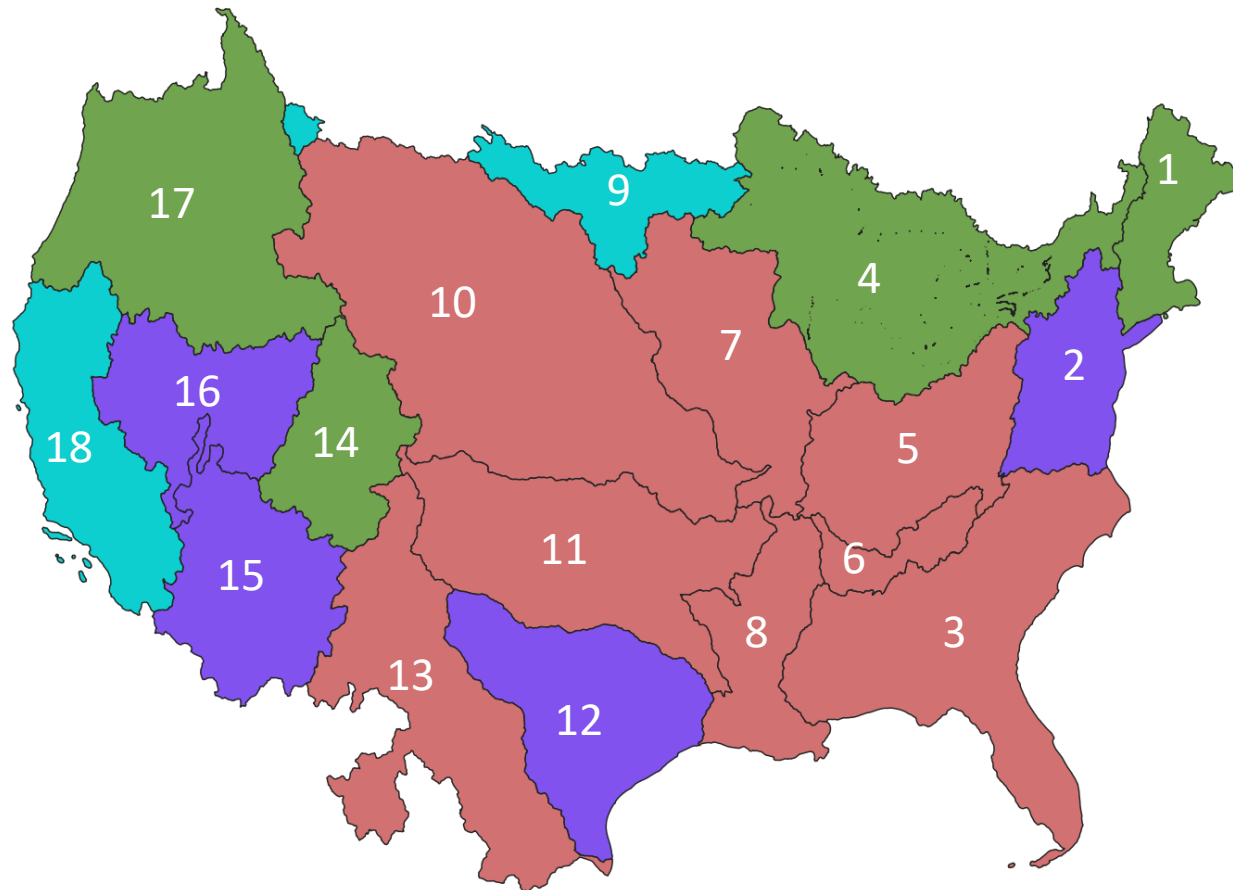
Challenge:

- We know that reservoir operations have dramatically reshaped watershed behavior across the country

- Reservoir location and construction is well documented in multiple databases, but **historical operations are not centrally recorded**

- As a result most national modeling and analyses rely on optimized or generic operating policies.

Goal:

- **Assemble a national database of historical reservoir operations** that can be used to evaluate historical reservoir impacts and derive data operating policies

Data assembly progress so far

- Operations data for 350 Reservoirs
- From four different federal agencies and 14 different local offices – Tennessee Valley Authority, Army Corps of Engineers, Bureau of Reclamation
- Most reservoirs include daily and monthly inflows outflows and change in storage
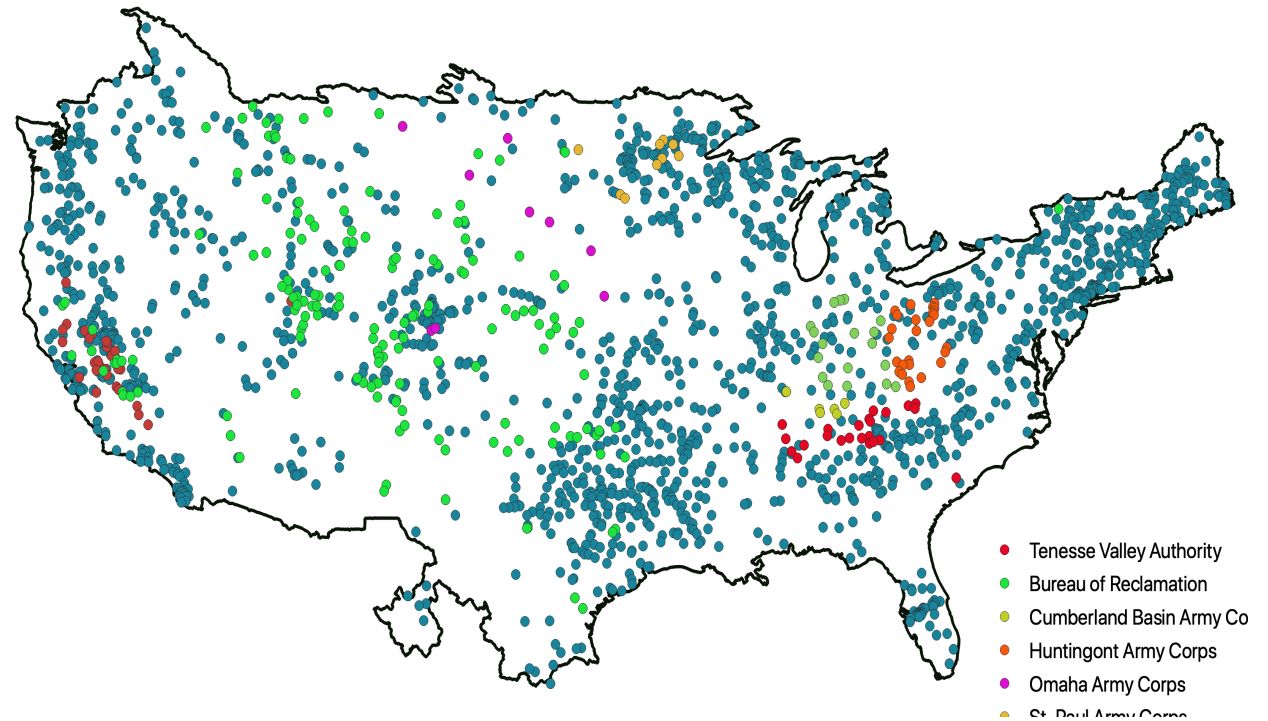
Next steps: Making a FAIR database for historical reservoir operation analysis
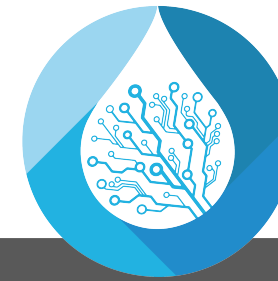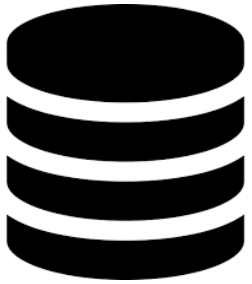
Database construction:
- Processing/standardizing all input data
- Adding metadata and attributes
- Linking to NABD and Grand Databases
- Linking to HydroSheds stream reaches

Version control and workflow tools:
- Constructing database through GitHub taking advantage of version control
- Including workflows for data processing and analysis

Hydrologic applications
- Implementing operations in a national hydrologic framework
- Developing tools for visualizing and sub-setting data interactively for a variety of users