

# Building a Collaborative Network of Reference Sites Across the Nation

NWQMC Meeting

July 14, 2010



# Building a Reference Network

- Provide a baseline to measure change across aquatic resources
- Develop more precise assessment tools and models
- Advance monitoring programs
- Monitor impacts of climate change



# Developing the Network-EPA

- Build upon national surveys to develop reference site network
- Work across jurisdictional and programmatic boundaries to advance multiple programs
  - Standard field and laboratory protocols
  - Consistent indicators
- Encourage/ contribute to continuously developing the network in new ways



# Working with Agencies

- Exchange reference sites with USGS, States and Tribes
- Target Federal Land for hand picked sites
- Partner with Agencies for sampling (USGS, Forest Service, NPS)
- Use local expertise to help identify reference sites

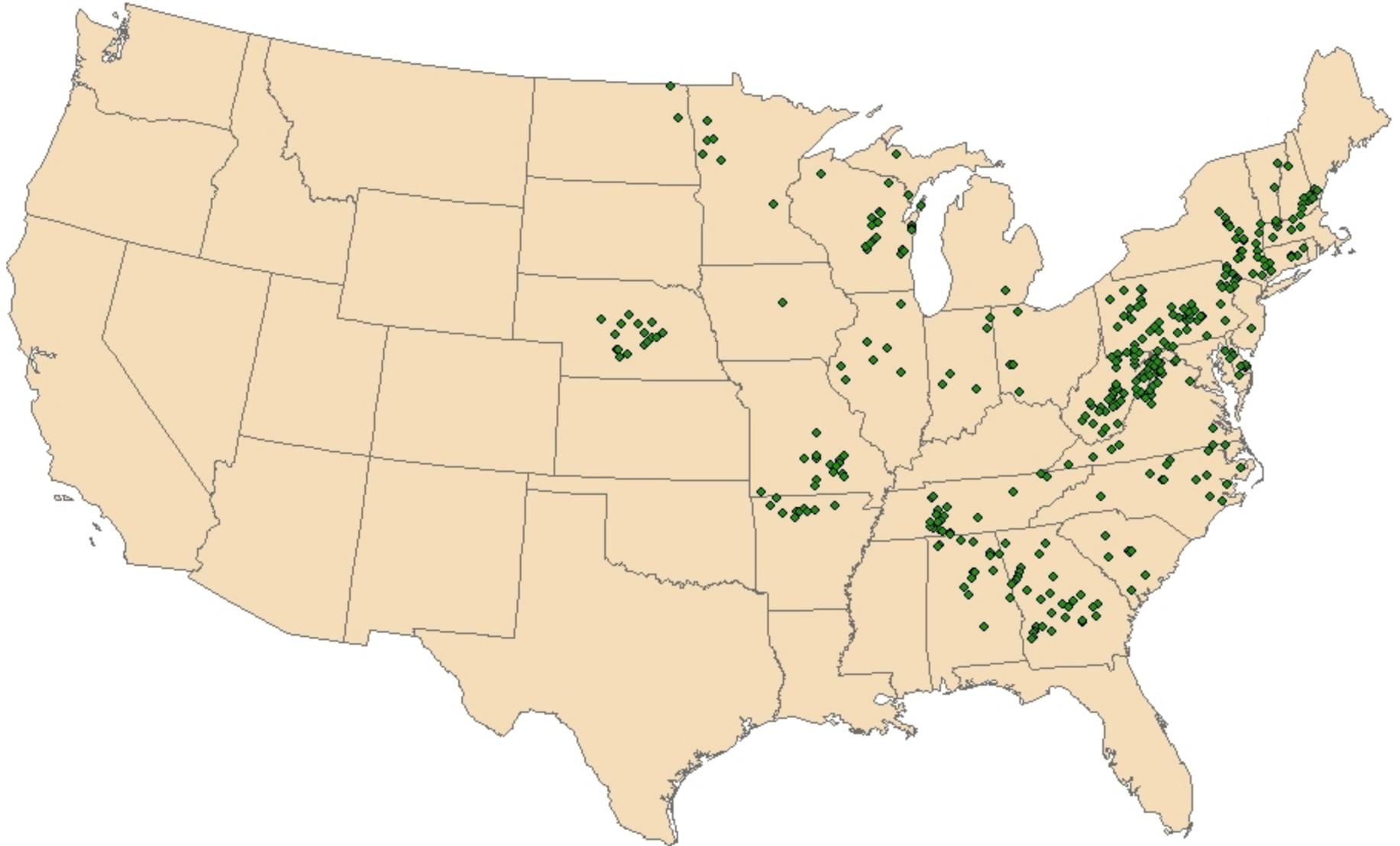


# National Wadeable Streams Assessment

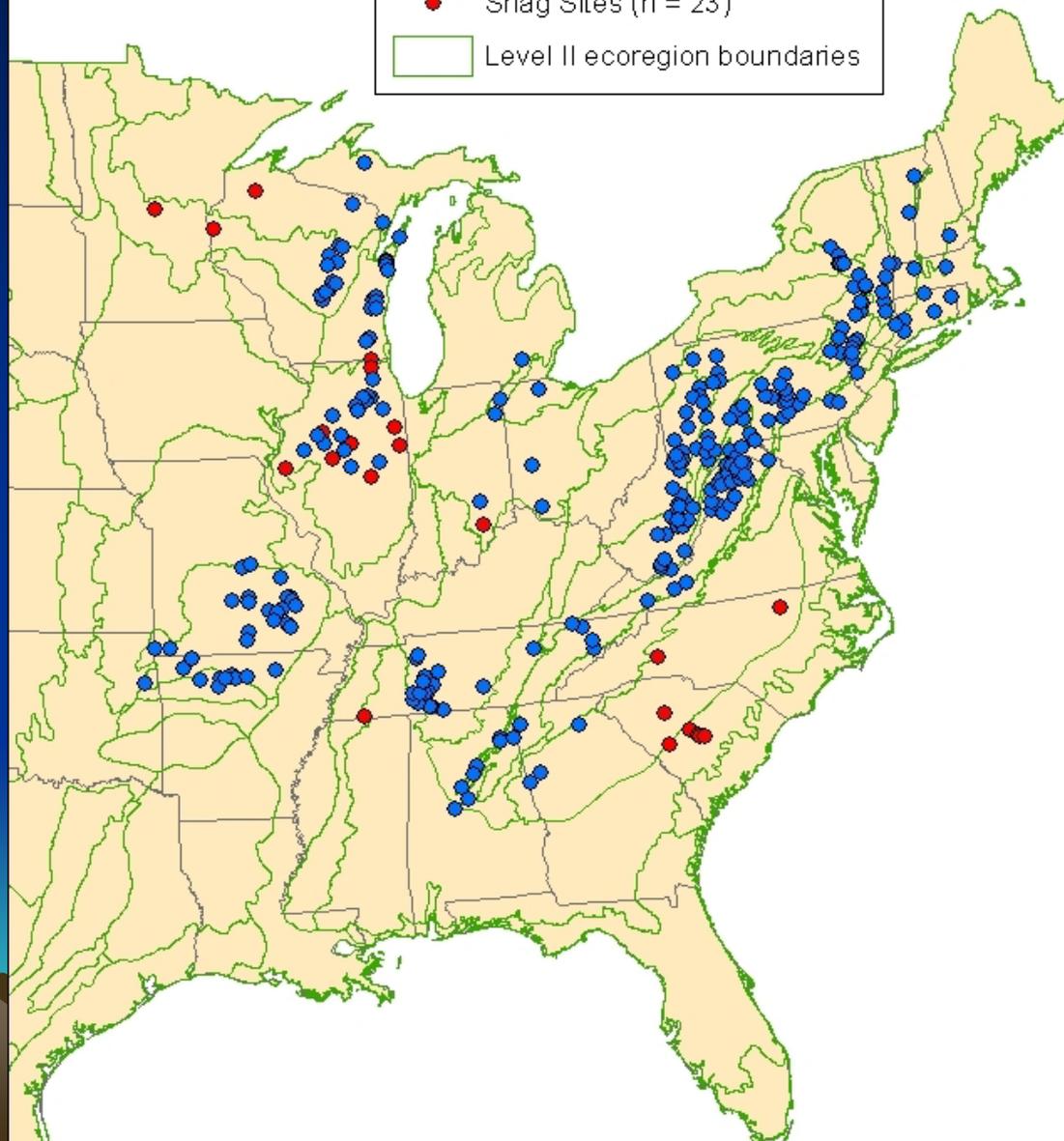
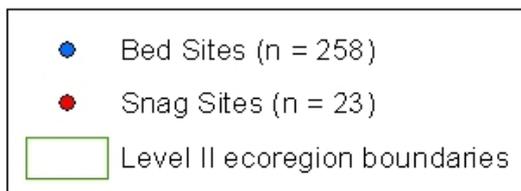
- Sites submitted by States, USGS, Tribes, REMAP programs, STAR grant
- Screening approach varied for Western EMAP and WSA eastern States



# USGS Candidate Sites



# USGS NAWQA Eastern US Reference Sites



# Reference Sites for EMAP - West

- About 110 sites designated as "reference" in West
  - 72 in the mountain ecoregions
  - 23 in the xeric ecoregions
  - 15 in the plains ecoregions
- Based on "Least Disturbed Condition"



# Reference Sites for the Eastern Portion of the Wadeable Streams Assessment

- 141 targeted reference sites
  - 16 in the coastal plain ecoregions
  - 24 in the piedmont ecoregions
  - 27 in the mountain ecoregions
  - 59 in the midwest ecoregions
  - 15 in the northeast ecoregions



# National Lakes Assessment

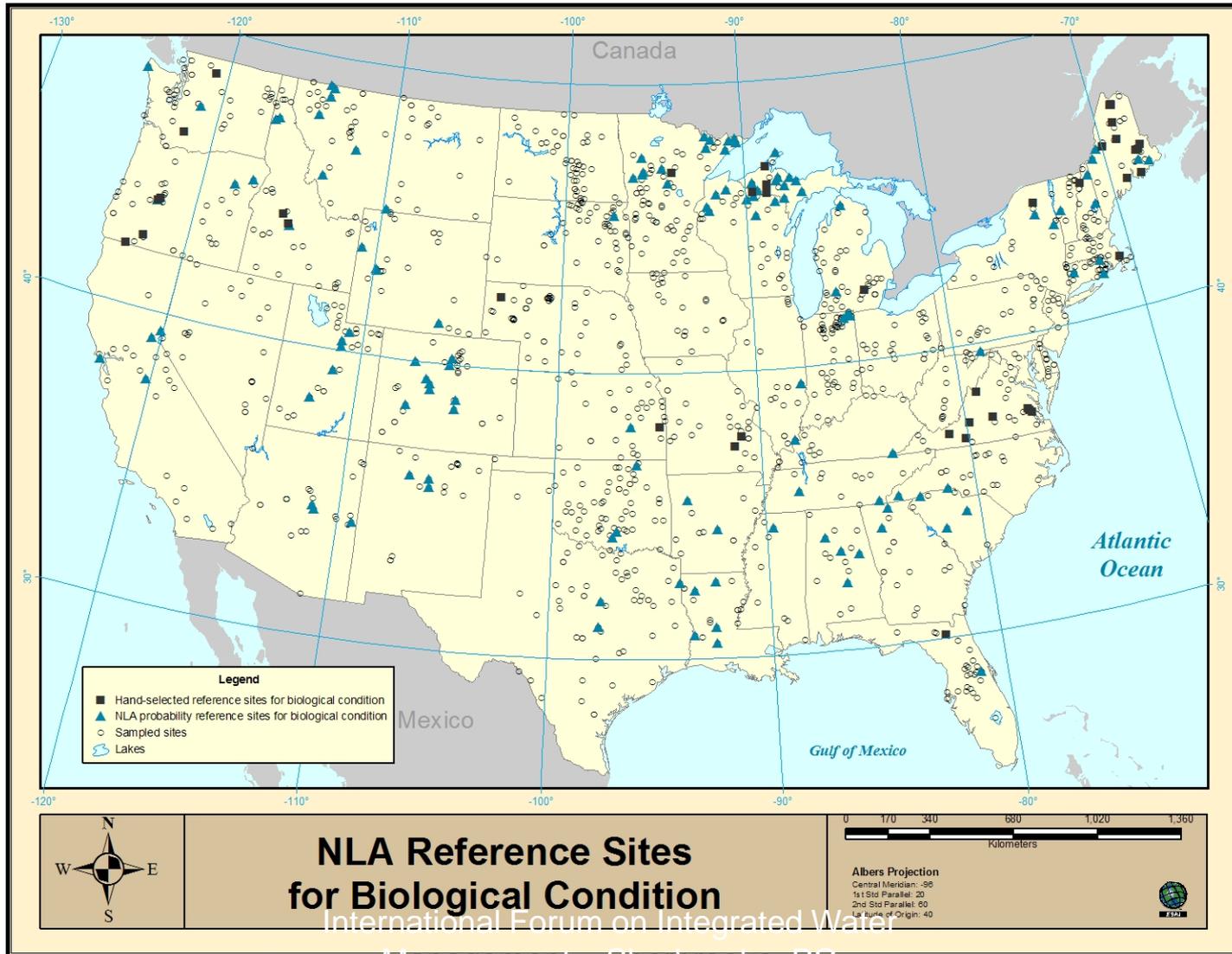
- 124 *a priori* selected reference lakes
- Biological: 170 reference lakes used
  - 43 hand picked; 127 were from probabilistic draw
  - 76 natural lakes; 109 man-made
- Nutrient: 195 Reference Lakes



# Selecting reference lakes

- Sets baseline against which disturbance is assessed
- The process:
  - 1) classify lake types;
  - 2) identify least-disturbed conditions by class;
  - 3) account for natural geographic variation.
- Physical attributes and landscape position determined class.
- Measured water quality used to screen for least-disturbed sites.

# Reference lakes

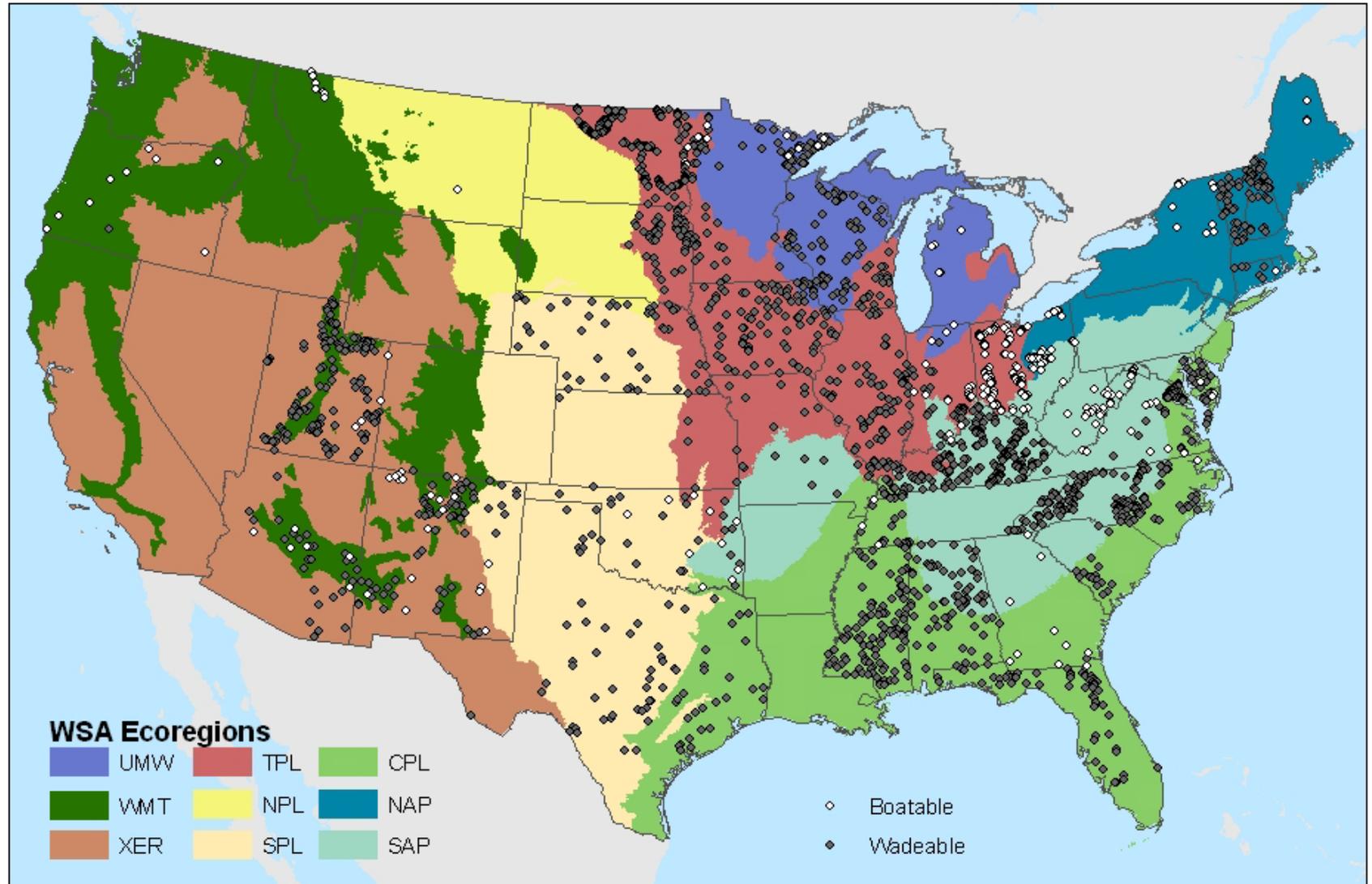


# National Rivers and Streams Assessment

- Rank candidate sites for level of disturbance
  - Filter thousands of state reference sites
- Target 200 sites for sampling
  - 100 wadeable, 100 boatable
  - Sites distributed across ecoregions, focus on plains
    - 20 CPL, 20 TPL, 30 NPL + SPL, 10 UMW, 10 XER, 5 SAP, 5 NAP

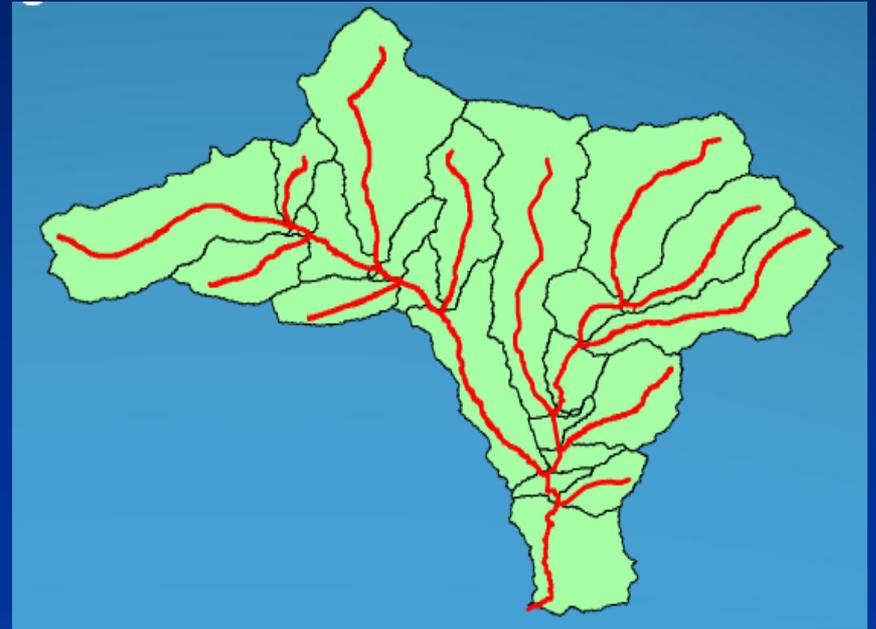


# Input Candidate Sites



# The Screening Procedure: 3 components

- 1) A quantitative disturbance score for the local watershed (the area draining to the reach segment)
- 2) A quantitative disturbance score for the cumulative watershed (includes the reach and all upstream reaches)
- 3) A visual assessment of disturbance at the 1:24,000 and 1:3,000 scales



# Challenges for Building a Reference Network

- Identifying reference sites
  - Across resource types, areas of country
- Consistent reference sites
  - Indicators, field protocols, lab protocols
  - Screening criteria
  - Quality
  - Terminology
- Funding Source
- Frequency of sampling



# Future Steps

- Collaborate with other Agencies; States, Tribes
- Continue to identify reference sites
  - National surveys, States/Tribal programs, etc
- Develop new screening tools for making sampling more efficient
- Further develop tools to allow assessment across sampling boundaries such as BCG



Questions?

