USEPA
National Rivers and Streams Assessment (NRSA)

Introduction

Presented by:
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What is the National Rivers and Streams Assessment (NRSA)?

The NRSA is a statistical survey of the condition of our Nation’s rivers & streams. The NRSA is designed to:

- Assess the condition of the Nation’s rivers and streams.
- Establish a baseline to compare future rivers and streams surveys for trends assessments.
- Evaluate changes in condition from the 2004 Wadeable Streams Assessment.
- Help build State and Tribal capacity for monitoring and assessment and promote collaboration across jurisdictional boundaries.
What is the NRSA?

- One of a series of water surveys being conducted by the U.S. Environmental Protection Agency, with states, tribes, and other partners
  - Other surveys study coastal waters, lakes, and wetlands in a revolving sequence
- Purpose is to generate statistically-valid and environmentally relevant reports on the condition of the Nation’s water resources
# National Water Resource Survey Schedule

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What is the goal of the NRSA?

The goal of the NRSA is to address two key questions about the quality of the Nation’s rivers and streams:

- What percent of the Nation’s rivers and streams are in good, fair, and poor condition?
- What is the relative importance of key stressors such as nutrients and pathogens?
Survey Design

- Probability-based survey design
- Balance sample size equally across Strahler order to permit estimates by category
  - 1st – 4th order (~900 sites)
  - 5th+ order (~900 sites)
- 450 of the wadeable sites were selected using an unequal probability design from the WSA original sites
- Explicitly stratified by state
- Additional “oversample” sites available so that states can replace non-target sites and those wishing to conduct a state scale assessment can be accommodated
What flowing waters are included in the NRSA?

1800 probability plus 200 reference sites:

- All streams and rivers within the 48 contiguous states that have flowing water during the study index period
- Run-of-the-river ponds and pools
- Great Rivers
What flowing waters are not included in the NRSA?

- portions of tidal rivers up to head of salt
- reservoirs
Wadeable Streams Assessment
2004

West
152,425 stream miles

Plains and Lowlands
242,264 stream miles

Eastern Highlands
276,362 stream miles

WSA Mega Regions*:
- West
- Lowlands
- Eastern Highlads
*Based on Ecoregion Landscapes

National Biological Quality
- Good
- Fair
- Poor
- Not Assessed
1800 NRSA Sites
New Jersey Participation

- NRSA sites:
  - 7 Non-Wadeable “base” sites
  - 4 sites on main stem of Delaware River
  - 8 Wadeable “base” sites
- NJDEP sampling at 2 of the Delaware River non-wadeable sites w/ help from DRBC staff
  - Washington’s Crossing (FW08NJ008)
  - Dingman’s Ferry (FW08NJ009)
New Jersey Participation

• Sampling targeted for July 2008
• Sampling Logistics
  – Four sampling crews (3 NJDEP & 1 DRBC)
    • Physical/Chemical monitoring
    • Benthic macroinvertebrate monitoring
    • Fish assemblage monitoring
    • Habitat / Thalweg assessment
Data Quality Objectives

• National estimates
  – Estimate the proportion of rivers and streams (± 5%) in the conterminous U.S. that fall below the designated threshold for good conditions for selected measures with 95% confidence.

• Ecoregions
  – Estimate the proportion of rivers and streams (± 15%) in a specific ecoregion that fall below the designated threshold for good conditions for selected measures with 95% confidence.
Reference Site Selection

- Selected by participant agencies
- Identifying candidate reference sites in “least disturbed” condition in different regions
Repeat Sampling

• 180 sites (10% of total) will be visited 2 times during the sampling period
  – Each state has 4 repeat sites; the first 2 wadeable and the first 2 non-wadeable sites in their list
  – Maximize length of time between visits
  – Minimize extended trips

• Replicate: “measurement” variability and index period variability

• Duplicate (spatial replicate): “measurement” variability
Revisits and Field Duplicate Design

First 10% of sites on list

Visit 1

Primary Sample (P)
water chemistry
Secchi depth
In situ measures
chlorophyll-a
sediment enzymes
periphyton
benthos
enterococci
fish
fish tissue
physical habitat

Filter Blank (F)
Enterococci
Collect on visit where duplicate samples are NOT collected

Duplicates = “measurement” variation
Revisits = “measurement” variation + index period variation

Visit 2

Primary Sample (P)
water chemistry
Secchi depth
In situ measures
chlorophyll-a
sediment enzymes
periphyton
benthos
enterococci
fish
fish tissue
physical habitat

Field Duplicate (D)
water chemistry
Secchi depth
In situ measures
chlorophyll-a
sediment enzymes
periphyton
benthos
enterococci
fish
tissue
What variables will be measured?

- In situ temperature, pH, DO, and conductivity
- Secchi transparency (*non-wadeable only*)
- Water chemical quality & nutrient concentrations
- PPCP chemicals (*at select urban sites*)
- Chlorophyll-a
- Sediment enzymes
What variables will be measured?

- Periphyton
- Benthic macroinvertebrates
- Enterococci
- Fish
- Fish Tissue *(non-wadeable only)*
- Physical habitat characteristics
Achieving the Objectives

• Probability design means we can extrapolate beyond the sample to the national population of rivers and streams that meet our sampling criteria
• But only if we stick to the rules:
  – Non-target or otherwise not sampleable rivers and streams must be substituted in a specific order, and
  – All sites on the list must be accounted for, even if not sampled
  – Even if you know a better way to do it, stick to the protocols to maintain consistency across sites and regions
    • Clearly note any deviation you have made and why
  – We don’t know what you found if you don’t write it down on a data form
Questions?