Reporting on Ecological Condition and Ecosystem Services for the 2011 National Wetland Condition Assessment

Mary E. Kentula, Teresa K. Magee, and Amanda M. Nahlik

U.S. Environmental Protection Agency
NHEERL Western Ecology Division, Corvallis, OR

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## NWCA Data Collection and Processing

<table>
<thead>
<tr>
<th>TYPE</th>
<th>INFORMATION</th>
<th>SAMPLES</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vegetation</td>
<td>QA / Unknown Identification</td>
<td>10,000</td>
</tr>
<tr>
<td>Soils</td>
<td>Chemistry, bulk density, enzyme, and isotope analysis</td>
<td>8,500</td>
</tr>
<tr>
<td>Water Chemistry / Chlorophyll-a</td>
<td>Water-quality analysis</td>
<td>2,000</td>
</tr>
<tr>
<td>Algae</td>
<td>Taxonomic identification and toxins</td>
<td>2,000</td>
</tr>
<tr>
<td>Site Forms (Packets)</td>
<td>Site characterization, vegetation composition and cover, soil profile, hydrology, stressors, buffer, and USA-RAM metrics</td>
<td>70,000+ pgs</td>
</tr>
</tbody>
</table>
POTENTIAL FRAMEWORKS FOR REPORTING ON ECOLOGICAL CONDITION AND ECOSYSTEM SERVICES FOR THE 2011 NATIONAL WETLAND CONDITION ASSESSMENT
Chapters in NARS Reports

• Introduction and Overview of Assessment
• Description and Extent of resource
• Ecological condition of resource
• Extent of stressors
• Relationship between stressors and condition
• Summaries of the above by Ecoregion
Description and Extent of Resource

Example from NLA

Options for NWCA

- Area of resource and by class
- Description of Palustrine Farmed Class
- Description of Palustrine Unconsolidated Bottom Class
- Description of unsampleable
- Relationship to FWS Status and Trends reporting

USEPA National Wetland Condition Assessment
Condition of the Resource

The current state of the resource compared to reference relative to physical, chemical, and biological characteristics

- Use biological indicators
  - Vegetation
  - Algae
- Use soil indicators
Numbers of Plant Taxa Observed in the 2011 NWCA (Incomplete):

- 3684 taxa (mainly species level)
- 192 families, 943 genera
- 444 Asteraceae, 399 Poaceae, 360 Cyperaceae

**Growth Habit**

- Forb: 48%
- Graminoid: 20%
- Vine: 12%
- Subshrub: 9%
- Shrub: 7%
- Tree: 4%

**Duration**

- Perennial: 81%
- Annual: 15%
- Biennial: 4%

**Category**

- Dicots: 66%
- Monocots: 31%
- Gymnosperms: 1%
- Ferns: 2%
Non-Native Species (Incomplete):

Alien to Entire Lower 48 State Floristic Area:
- 372 (10%) of observed NWCA species
- At least 223 (60%) are listed as invasive

Other Likely Sources of Alien Species:
- **Adventive** species native in some parts of US, but introduced in others
- **Taxa with introduced subspecies or varieties**
- **Cryptogenic species** with native and introduced genotypes or unknown origin

Native Status

- Non-native to Lower 48 (Invasive)
- Non-native to Lower 48
- ??? (Native + Alien)
Extent of Chemical Stressors

Example from WSA

Options for NWCA

Water chemistry
- pH
- Conductivity
- Nitrogen
- Phosphorus

Soil chemistry
- Carbon
- Nitrogen
- Sulfur
- Calcium
- Potassium
- Magnesium
- Sodium
- Aluminum
- Iron
- Manganese
- Trace Elements
  - Mercury
  - Arsenic
  - Cadmium
  - Lead
  - Zinc
  - Etc.

Figure 16. Total nitrogen concentrations in U.S. streams (USEPA/WSA). Percent of stream length with low, medium, and high concentrations of nitrogen based on regionally relevant thresholds derived from the least-disturbed regional reference sites. Low concentrations are most similar to reference condition; medium concentrations are greater than the 75th percentile of reference condition; and high concentrations are greater than the 95th percentile of reference condition.
Extent of Physical Stressors

Example from WSA

Options for NWCA

In Assessment Area
- Vegetation Structure
- Hydrology stressors
- Soil bulk density

In Buffer
- Land use
- Vegetation structure
- Hydrology stressors

Figure 22. Riparian disturbance in U.S. streams (U.S. EPA/WSA). This indicator is based on field observations of 11 different types of human influence (e.g., dams, pavement, pasture) and their proximity to a stream in 22 riparian plots along the stream.
Stressors and Condition

Example from NLA

Relative risk – expresses the likelihood of having poor ecological condition when a stressor is high

Attributable risk – estimates the proportion of the population in poor condition that would be reduced if a particular stressor were eliminated

Figure 15. Relative extent of poor stressors conditions. Relative risks of impact to plankton O/E and Attributable risk (combining Relative extent and Relative risk).
Wetland Ecosystem Services

Provision of Water for Consumption thru
Signatures of the Stable Isotope of Nitrogen ($\delta^{15}$N) as an Indicator of Denitrification
Timeline of Key Activities

- **May 2012**: Working Meeting w/ Partners
- **Sept 2012**: Lab Analysis and Data Management Complete
- **Fall/Winter 2012**: Data Analysis Workshops
- **Winter 2013**: Continue Data Analysis and Report Writing
- **Spring 2013**: Finalize Data Analysis and Report Text
- **Summer 2013**: Preliminary Report Review by States
- **Summer 2013**: Peer Review
- **Fall 2013**: Public Comment
- **December 2013**: Finalize Report

USEPA National Wetland Condition Assessment
National Aquatic Resource Surveys (NARS)

Includes: Coastal Systems, Rivers and Streams, Lakes, Wetlands

http://water.epa.gov/type/watersheds/monitoring/aquaticsurvey_index.cfm