Wetlands Functional Analysis and Designated Use Assessment: The Same thing by Different Names?

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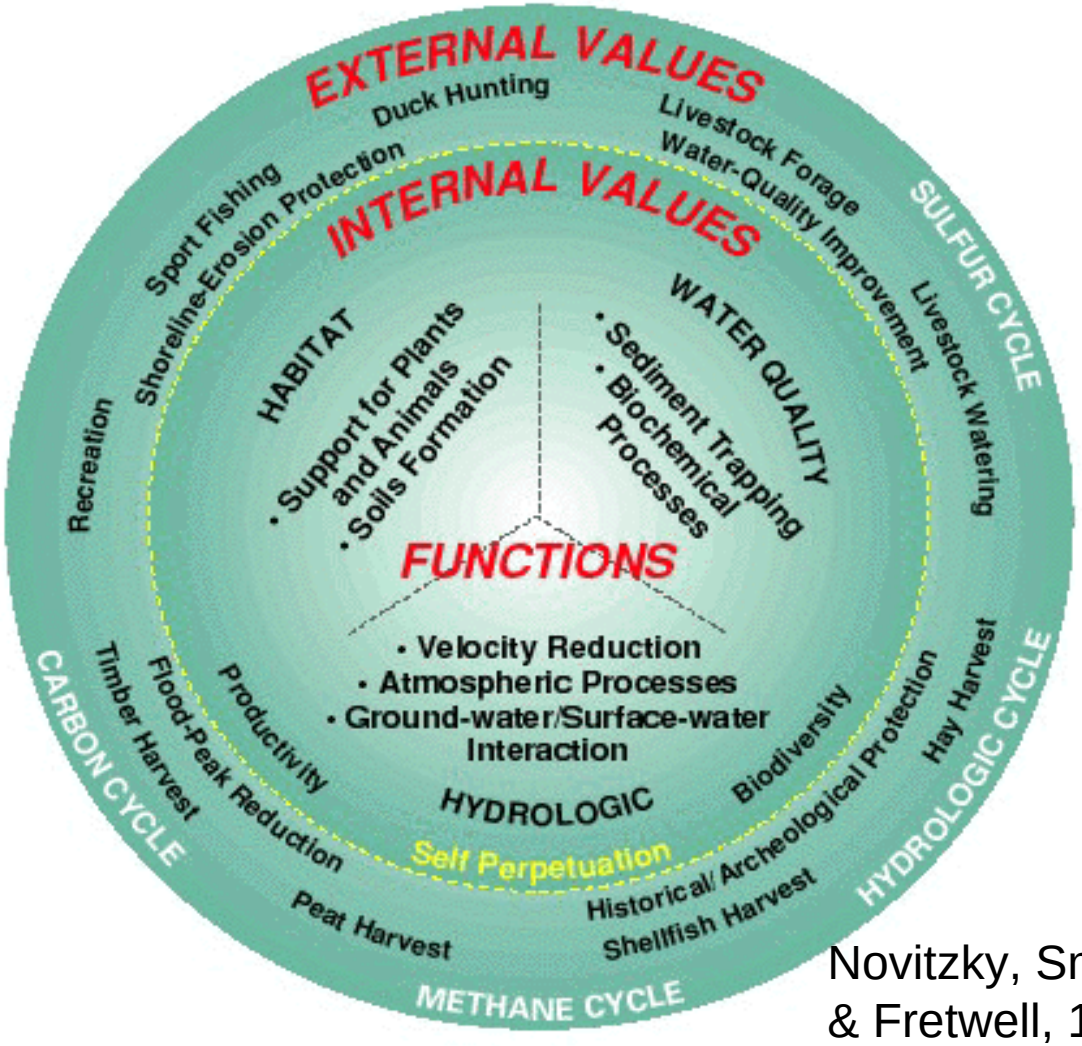
TWO COMMUNITIES OF PRACTICE

- Both derive from the Clean Water Act
- **Surface Water Quality Standards [sec 303]**
  - Designated uses and criteria / assessment: pass/fail
  - Focus is rivers, lakes, and estuaries
    - "waters of the US" includes wetlands
  - "Biological (or ecosystem) integrity focus is animals
- **Wetlands permitting [sec 404]**
  - Functions and values / avoidance & mitigation
  - Focus is wetlands
    - "waters of the US" includes rivers, lakes, estuaries
  - "Biological (or ecosystem) integrity focus is plants



Novitzky, Smith, & Fretwell, 1995

Figure 51. Wetland functions and internal and external values.

WATER QUALITY STANDARDS

- Designated Uses
- Criteria to support The uses
- Antidegradation

CONNECTICUT METHOD

- Flood Control
- Ecological Integrity
- Wildlife Habitat
- Fish Habitat
- Nutrient Retention and Sediment Trapping
- Education Potential
- Visual/Esthetic Quality
- Agricultural Potential
- Forestry Potential
- Water Based Recreation
- Ground-water Use Potential
- Shoreline Anchoring and Dissipation of Erosive Forces
- Noteworthiness, including public water supply watersheds

WETLAND FUNCTIONAL EVALUATION

NEW HAMPSHIRE METHOD

Functional Value 1 - Ecological Integrity
Functional Value 2 - Wetland Wildlife Habitat
Functional Value 3 - Finfish Habitat for Watercourse Associated With Wetland
Functional Value 4 - Educational Potential
Functional Value 5 - Visual/Aesthetic Quality
Functional Value 6 - Water-Based Recreation in Watercourse Associated with Wetland.
Functional Value 7 - Flood Control Potential
Functional Value 8 - Ground Water Use Potential
Functional Value 9 - Sediment Trapping
Functional Value 10 - Nutrient Attenuation
Functional Value 11 - Shoreline Anchoring and Dissipation of Erosive Forces
Functional Value 12 - Urban Quality of Life
Functional Value 13 - Historical Site Potential
Functional Value 14 - Noteworthiness....

HIGHWAY METHODOLOGY

Function/Value
Groundwater Recharge/Discharge
Floodflow Alteration
Fish and Shellfish Habitat
Sediment/Toxicant Retention
Nutrient Removal
Production Export
Sediment/Shoreline Stabilization
Wildlife Habitat
Recreation
Educational/Scientific Value
Uniqueness/Heritage
Visual Quality/Aesthetics
ES Endangered Species Habitat

AT LEAST 33 METHODS FOR WETLANDS “ASSESSMENT” Or “FUNCTIONAL EVALUATION”

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DESIGNATED USES

NEW HAMPSHIRE

Aquatic Life
Cold Water Fishery
Designated Beach
Drinking Water Supply
Fish Consumption
Primary Contact Recreation
Secondary Contact Recreation
Wildlife
[Proposed: Geomorphic Integrity]

MAINE

Drinking Water Supply After Treatment
Fish And Other Aquatic Life
Fish Consumption
Fishing
Hydroelectric Power Generation
Industrial Process And Cooling Water Supply
Navigation
Primary Contact Recreation
Secondary Contact Recreation
Wildlife

MASSACHUSETTS

Aesthetic
Agriculture
Fish, Other Aquatic Life And Wildlife
Industrial Cooling
Primary Contact Recreation
Public Water Supply
Secondary Contact Recreation
Shellfish Harvesting

RHODE ISLAND

Fish And Wildlife Habitat
Fish Consumption
Primary Contact Recreation
Secondary Contact Recreation

CONNECTICUT

Agriculture
Fish Consumption
Habitat For Fish, Other Aquatic Life And Wildlife
Industrial Supply
Potential Drinking Water Supplies
Recreation

VERMONT

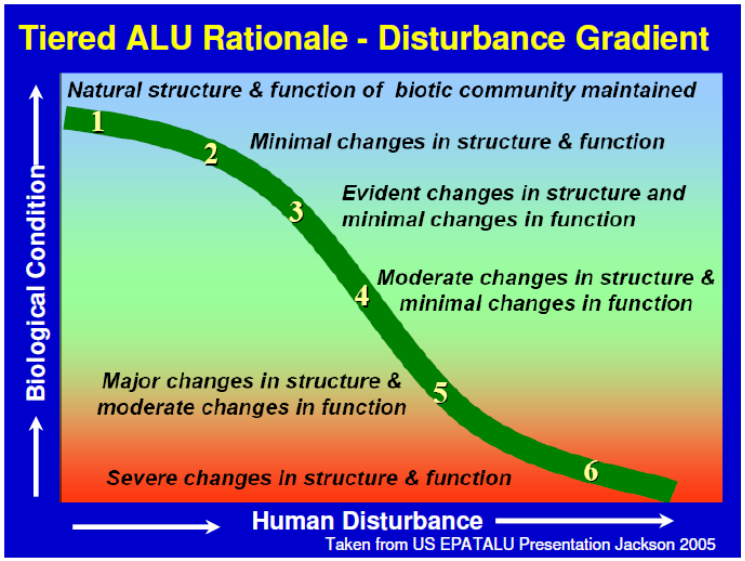
Aesthetic
Aquatic Biota, Wildlife, And Aquatic Habitat
Boating, Fishing, And Other Recreational Uses
Cold Water Fishery
Fish Consumption
Irrigation Of Crops And Other Agricultural Uses
Public Water Supply
Swimming And Other Primary Contact Recreation
Warm Water Fishery

COMMON ATTRIBUTES

- Quantitative or semi-quantitative
- Ranking scheme

Rank the Wetlands for Each of the Functional Values *Except* Noteworthiness

Ranking must be done for <u>all</u> the wetlands evaluated in the study area. All the wetlands should therefore be evaluated <u>prior</u> to ranking.



NH CROSSWALK

DESIGNATED USE	FUNCTIONAL VALUE
Aquatic Life /Biological Integrity	Ecological Integrity Finfish Habitat
Drinking Water Supply	GW Use Potential
Pri Contact Recreation Designated Beach Sec Contact Recreation	Water-based Recreation
Wildlife	Wetland Wildlife Habitat

NH CROSSWALK -continued

DESIGNATED USE	FUNCTIONAL VALUE
Fish Consumption	
	Educational Potential Visual/Aesthetic Quality Urban Quality of Life Historical Site Potential Noteworthiness
Turbidity criteria Nutrient criteria	Sediment Trapping Nutrient Attenuation
[Geomorphic Integrity]	Flood Control Potential Shoreline Anchoring

PERHAPS BOTH ARE ATTEMPTING TO IDENTIFY AND QUANTIFY THE

ECOSYSTEM SERVICES

THAT WATERBODIES PROVIDE

- ECOSYSTEM SERVICES ~1997
  - the benefits people obtain from ecosystems.

    Millenium Ecosystem Assessment, 2005
- WETLAND FUNCTIONS ~ 1981
  - the physical, chemical, and biological interactions within wetlands

    NRCS Fact Sheet
- WETLAND VALUES ~ 1981
  - characteristics of wetlands that are beneficial to society

    NRCS Fact Sheet
- DESIGNATED USES ~ 1972
  - appropriate water uses to be achieved and protected.

    40 CFR 131.10

ECOSYSTEM DEFINITION

"… all of the organisms (ie: the "community") in a given area interacting with the physical environment so that a flow of energy leads to clearly defined trophic structure, biotic diversity, and material cycles…"

Odum, 1971

SURFACE WATERBODIES (ALL KINDS) ARE KIND OF LIKE ECOSYSTEMS, WITH "ASSESSMENT UNITS" AS CONVENIENT CATALOGING UNITS

ECOSYSTEM SERVICES

- "…the benefits people obtain from ecosystems" -Millenium Assessment, 2005
- "… components of nature, directly enjoyed, consumed, or used to yield human well-being."*
  - Services are **characteristics**, not functions or processes
  - Services are **components** of nature

*Boyd and Banzhaff, 2006

Source: Millennium Ecosystem Assessment

Ecosystems and Human Well-being

MILLENNIUM ECOSYSTEM ASSESSME

January 2006 ■ RFF DP 06-02

What Are Ecosystem Services?

The Need for Standardized Environmental Accounting Units

James Boyd and Spencer Banzhaf

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BENEFITS	ECOSYSTEM SERVICES ("end products of nature")	INTERMEDIATE PRODUCTS/PROCESSES
Public Water Supply	Biological Integrity [habitat and organisms]	Sediment Transport or Retention
Recreation	Physical & Chemical WQ	Nutrient Cycling
Fish & Shellfish Consumption	Existence	Toxics assimilation or attenuation
Damage Avoidance	Water Quantity / Flow	Flood Mitigation
Cultural Amenities	Geomorphic Integrity	
Navigation		
Agricultural Water Supply		

DISCUSSION?

THANKS!

RANKING SCHEME

Rank the Wetlands for Each of the Functional Values *Except* Noteworthiness

Ranking must be done for all the wetlands evaluated in the study area. All the wetlands should therefore be evaluated prior to ranking.