2012 National Lakes Assessment: Reporting on the Condition of the Nation's Lakes

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Purpose of National Aquatic Resource Surveys

- Meet Clean Water Act requirement to report on the condition of waters of the U.S.
  - Unbiased estimate of condition based on randomly selected, representative subset of waters
  - Report on core indicators with regional supplements
  - Standardized or comparable methods
- Provide information on key questions:
  - Extent of waters supporting healthy ecosystems, recreation?
  - Extent of resource affected by key water quality problems/stressors?

Basic Components of Surveys

- Randomized design to report on conditions of each resource at national, regional, and state (optional) scale
  - 1,000 sites for national & regional scale in lower 48 states
- Standard field and lab protocols for core indicators
- National QA program and data management
- Nationally consistent and regionally relevant data interpretation and reports

National Aquatic Resource Surveys: A five year recurring cycle

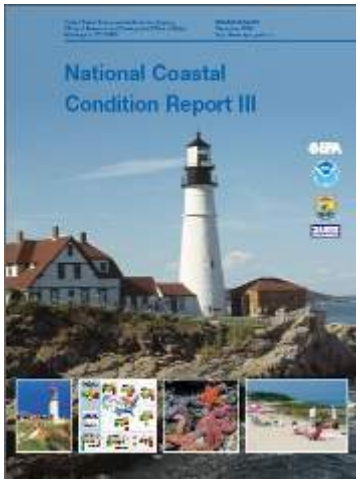
→'07 Lakes

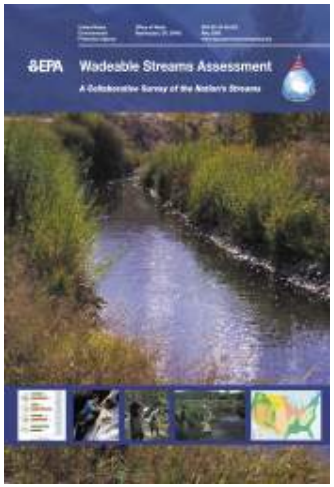
→'08 wadeable streams

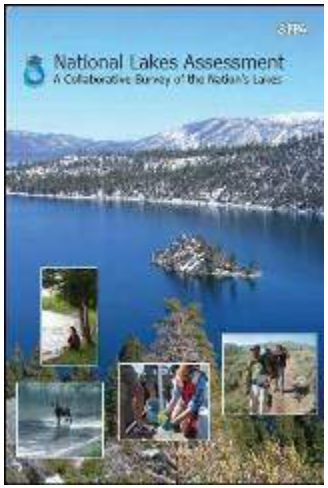
→ '09 large rivers

→'10 coastal estuaries

→'11 wetlands





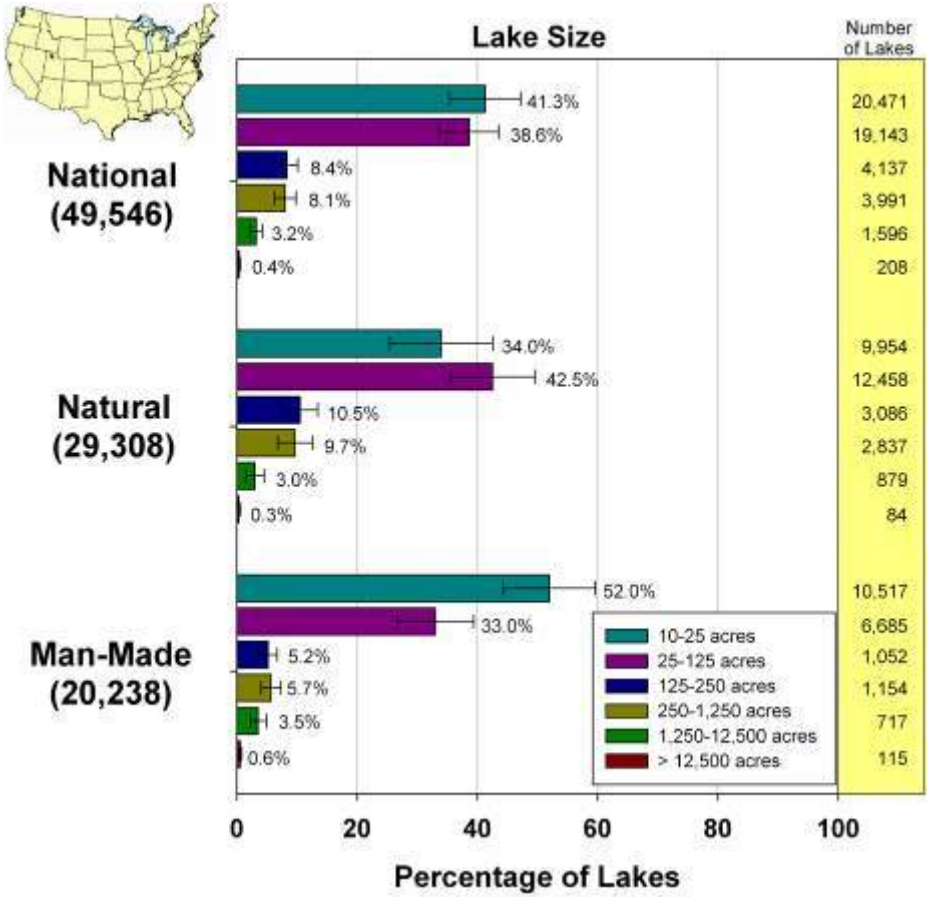


2007 National Lakes Assessment

- First-ever nationally-consistent assessment of the nation's lakes, ponds and reservoirs
  - Biological and habitat condition
  - Recreational condition
  - Trophic state
- The 1,028 unique lakes sampled – plus 124 hand-selected reference lakes, and 100 resample visits – describe the condition of about 50,000 lakes nationwide

The NLA represents:

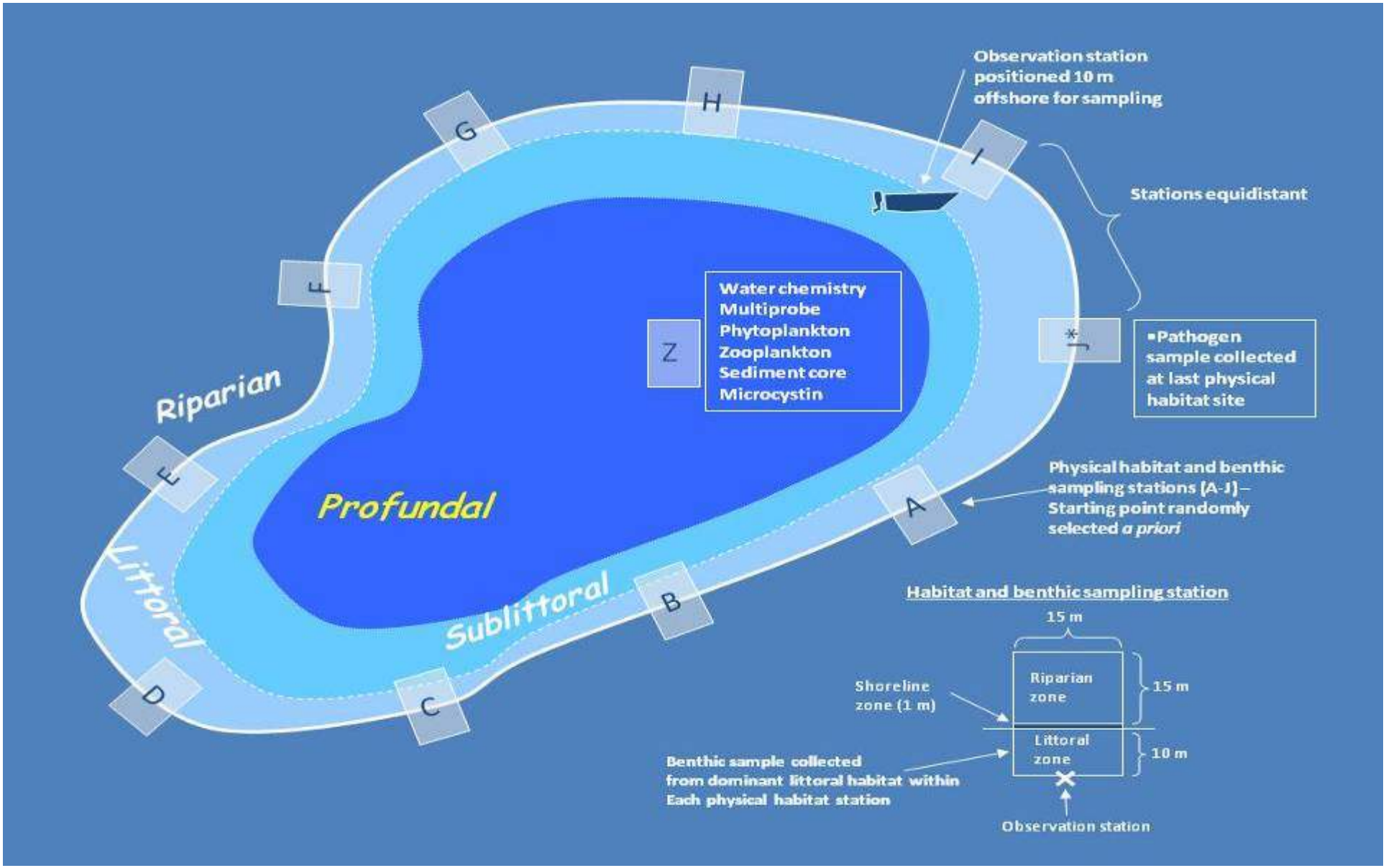
- 49,560 “lakes”
- 59% natural origin
- 41% constructed



National Lakes Assessment: Selected Indicators

- Biological Integrity
  - Macroinvertebrate Index
  - Planktonic Index of Taxa Loss
  - Diatom Index of Biotic Integrity
- Trophic State
- Recreational Use
  - Occurrence of microcystin
  - Risk of cyanotoxin exposure
  - Enterococci
- Habitat Quality
  - Lakeshore Vegetation Cover
  - Littoral Quality
  - Human Shoreline Disturbance
- Chemical stressors
  - Nutrients
  - pH
  - DO
  - Salinity
- Change over time
  - Sediment diatom cores

National Lakes Assessment: Sampling Approach

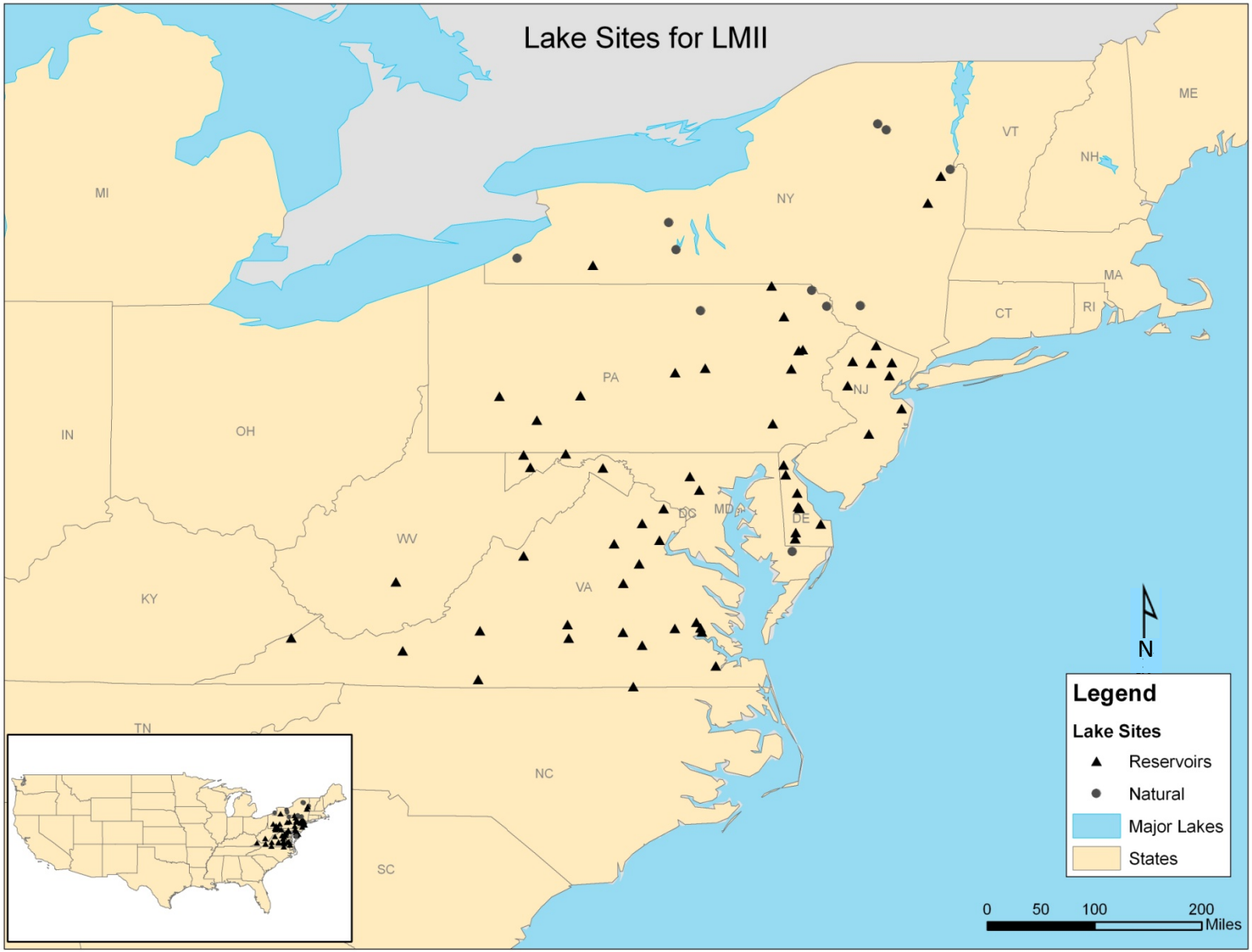


Key 2007 NLA Findings

- Condition of the nation's lakes
  - 56% support healthy biological communities
  - Microcystin detected in 30% of lakes and at levels of concern in 1%
  - Parallel study finds that 49% of the nation's lake have fish tissue mercury concentrations that exceed health based limits.
- Key stressors affecting quality
  - 36% of lakes have poor shoreline habitat; poor biological condition is 3 times more common in these lakes
  - 20% percent of lakes have high levels of nitrogen or phosphorus; poor biological condition is 2.5 times more common
- Trends of National Eutrophication Survey (NES) Lakes (1972→2007)
  - 50% of NES lakes showed decreases in phosphorus concentrations

The NJDEP in Action for the 2007 Assessment

DYNAMAC® CORPORATION



2012 National Lakes Assessment: Key Changes

NLA 2007

design

Probabilistic sample of lakes

Sample frame: NHD+

1028 lakes, ponds, and reservoirs in conterminous United States (+ 124 reference)

- Size: ≥ 4 Heactare
- Depth: ≥ 1 meter
- Open water: ≥ 0.1 Hectare

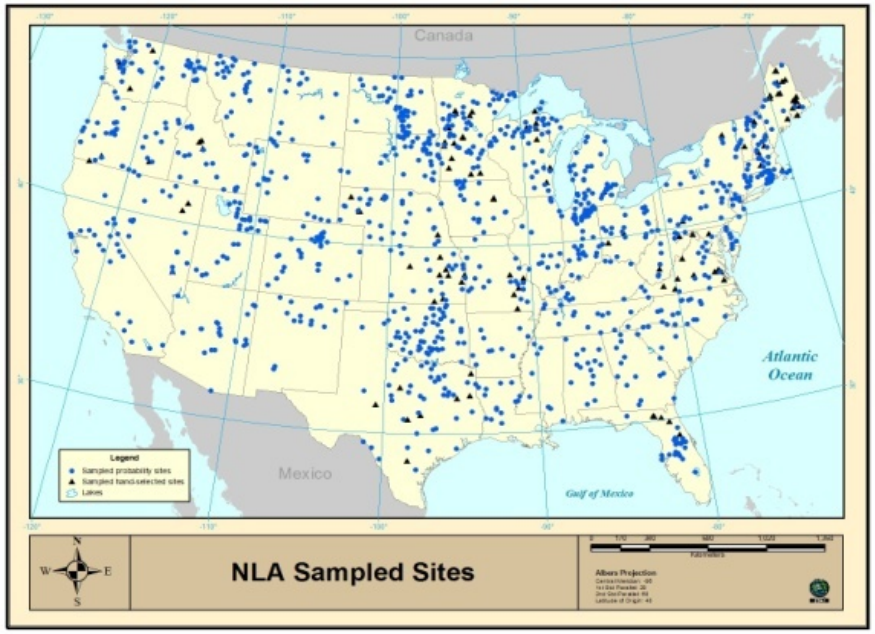
Represents 49,564 lakes across the nation

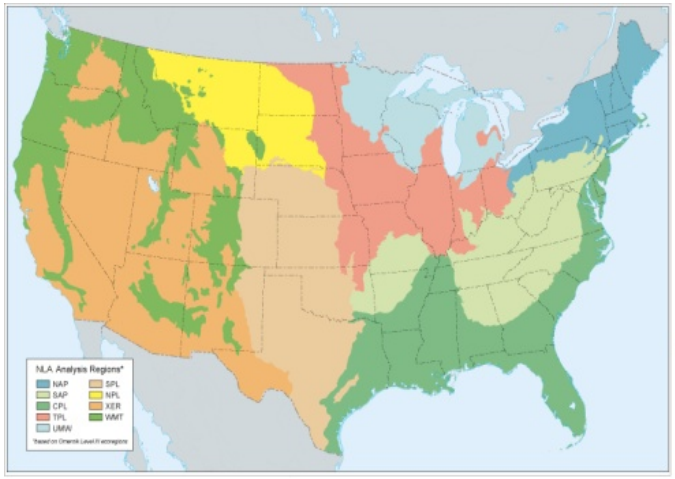
2007 new sites: 828

1970's NES revisit sites: 200

Excludes: Great Lakes, coastal lakes, aquaculture ponds, commercial treatment &/ or disposal ponds, small man-made stock ponds, and ephemeral lakes

Report nationally and nine regions





NLA 2012

design

Probabilistic sample of lakes

Sample frame: NHD+

1000 lakes, ponds, and reservoirs in conterminous United States

- Size: ≥ 1 Heactare
- Depth: ≥ 1 meter
- Open water: ≥ 0.1 Hectare

2007 revisit sites: 398

2012 new sites: 506

Resample sites: 96

Excludes: Great Lakes, coastal lakes, aquaculture ponds, commercial treatment &/ or disposal ponds, small man-made stock ponds, and ephemeral lakes

NLA 2012 indicators

Indicator type	Indicator	Modification
Biological integrity	Phytoplankton	
	Sediment diatoms	
	Zooplankton	Change nets and tow length
	Benthic macroinvertebrates	
Integrity of the physical habitat	Lakeshore habitat	Add draw-down
	Shallow water habitat	
	Human lakeshore disturbance	
	Macrophyte characteristics	New indicator
Human use	Cyanobacteria	
	Pathogens [E. coli]	Change from enterococci
	Algal toxins [microcystins]	Add littoral sample
	Triazine pesticide screen	New indicator
Trophic Status	Water chemistry and temperature	
	Chlorophyll-a	
	Nitrogen and phosphorus	
	Secchi depth	

2012 NLA New Jersey Lakes

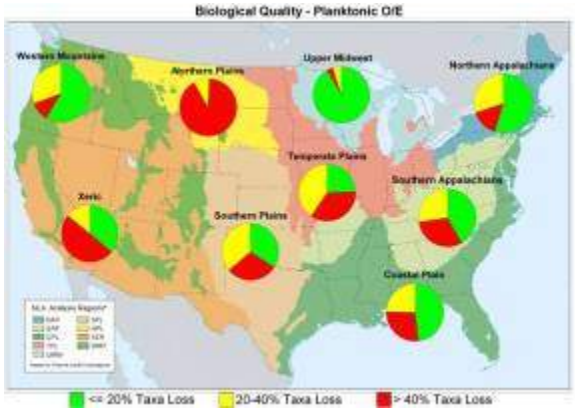
- 13 lakes (includes 2 revisits)
- Four NLA 2007 lakes revisited
- Largest lake (65.3 ha) and smallest lake (2.5 ha)
- EPA R2 enhanced aquatic macroinvertebrate sampling

For more information on the NLA go to:

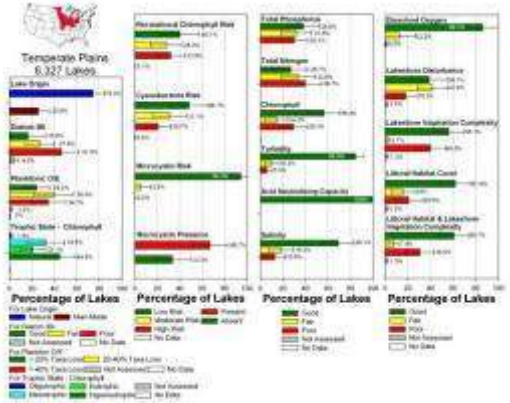
www.epa.gov/lakessurvey

Intro and Design

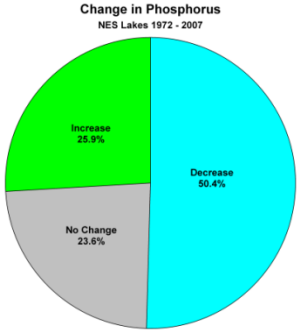
National Findings



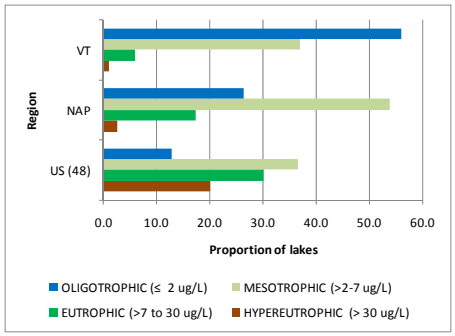
Ecoregional Findings



Change over Time



Uses of the NLA Results



Future Actions – NLA in 2012