

A photograph of a person wearing waders and a hat, standing in a river and using a net to sample water. The river is surrounded by lush green trees and vegetation. The water is turbulent, creating white foam. The person is positioned on the right side of the river, leaning forward. The background shows a dense forest of green trees and a small bridge in the distance.

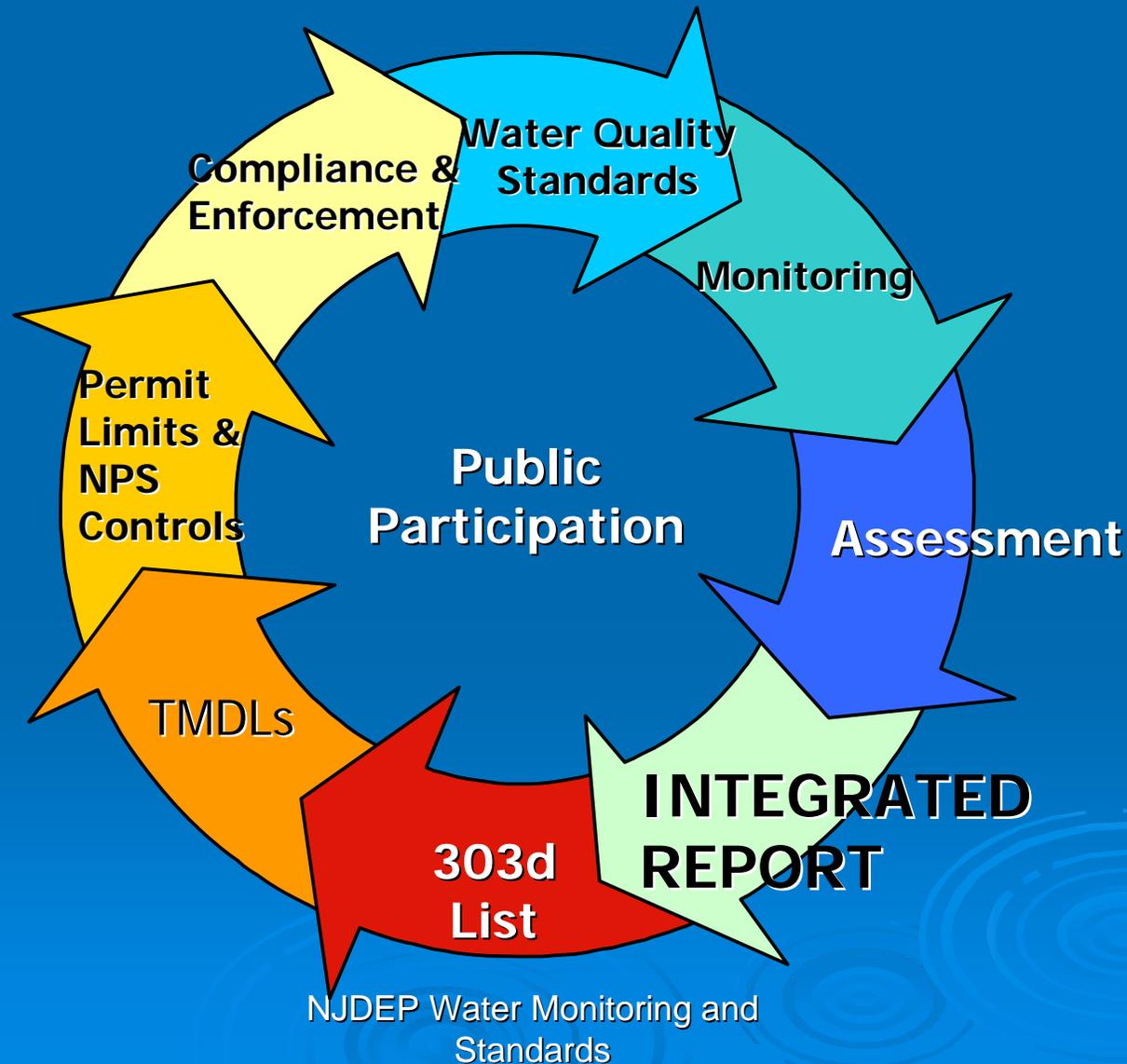
Integrated Water Quality Monitoring and Assessment

September 2011

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Role of Water Quality Assessment in Water Resource Management



Why Do We Assess Water Quality?

- Required under federal and state statutes:
 - Section 305(b) of Federal Clean Water Act
 - Section 303(d) of Federal Clean Water Act
 - Water Quality Planning Act (N.J.S.A. 59:11A)
- Necessary to determine appropriate regulatory, preventive, and restorative actions

Integrated Water Quality Assessment

Statewide Water
Quality Report
(305(b) Report)

Integrated Assessment

NJ - Since 2002

List of Water
Quality Limited
Waters
(303(d) List)

How Do We Assess Water Quality?

- Compare Data Results to Surface Water Quality Standards (SWQS)
 - Develop Scientific Methods for Sample Collection and Data Analysis
 - Collect and Compile Water Quality Data
 - Evaluate Data Quality
- Evaluate Data Trends:
 - Improving or declining water quality
 - Threatened Waters



What Data is assessed?

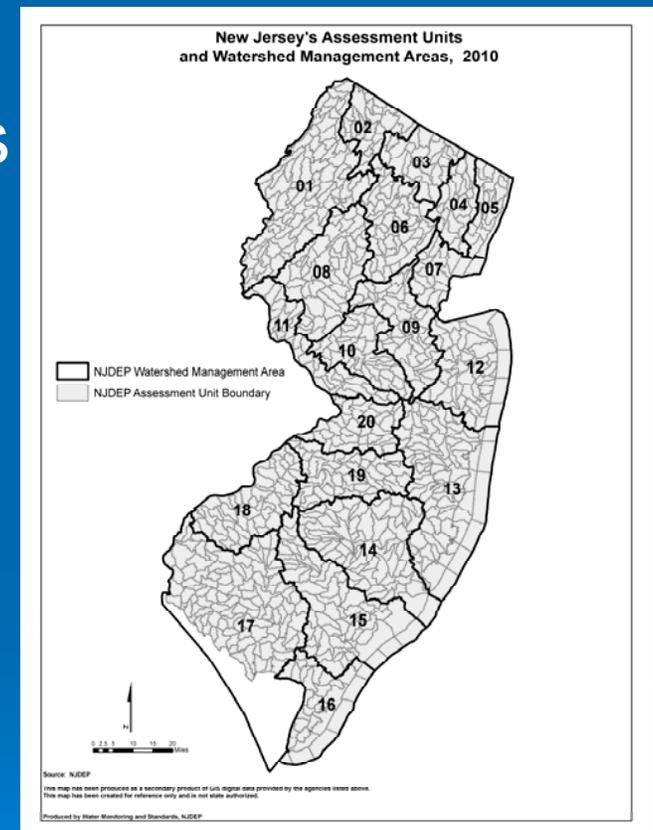
- Data From Over 5,000 Monitoring Stations:
- Agency-conducted (DEP and/or USGS) Monitoring Programs
 - Statewide, Regional, and Waterbody-specific
 - Chemical/physical Water Quality
 - Biological (macroinvertebrates, fish tissue)
- External Monitoring and Data Sources
 - USEPA, USGS
 - Counties
 - Volunteers and Other Monitoring Partners
 - Regulated Community (wastewater and water supply)

Minimum Suite of Parameters

Designated Use	Minimum Suite of Parameters
General Aquatic Life	Macroinvertebrate Indices or fish IBI
Aquatic Life - Trout	Biological data and Temp <u>and</u> DO
Recreation	Beach closure data and pathogens
Shellfish Harvest	Shellfish Classifications
Drinking Water Supply	Nitrate <u>and</u> TDS
Fish Consumption	Fish tissue data
Ag Water Supply	TDS

How are the assessment results presented?

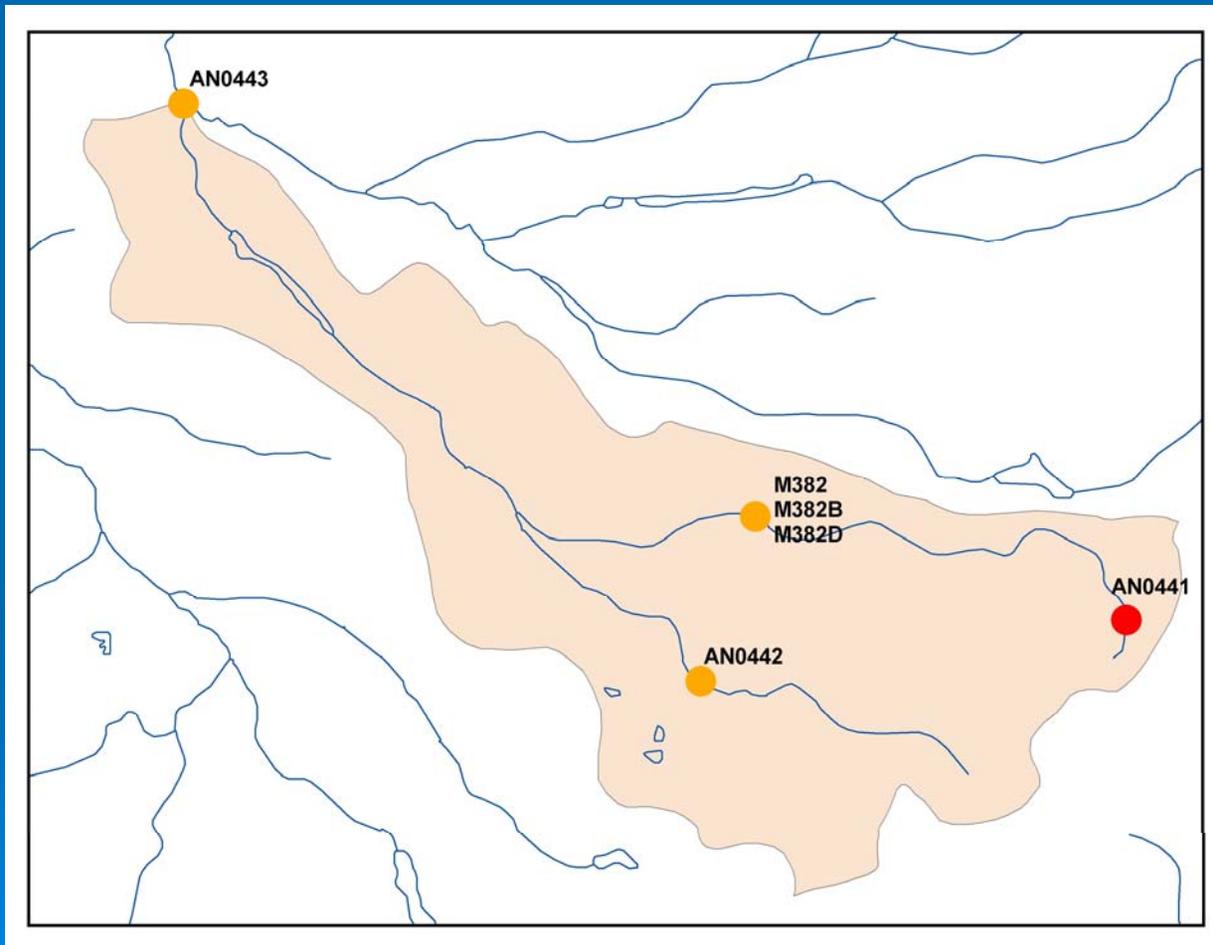
- Establishment of Assessment Unit (AU) Scale and Boundaries
 - USGS HUC 14 Subwatersheds (revised January 2009)
 - DRBC-assessed waters not included
 - **New total: 952 AUs**
- 4,200 designated uses assessed out of 6,400 possible assessments



Use Designations and Waterbody Classifications

Stream Classification	ALG	ALT	DWS	AWS	IWS	REC	FC	SF
FW1	X					X	X	
FW1 (TP, TM)	X	X				X	X	
PL	X		X	X		X	X	
PL(TM)	X	X	X	X		X	X	
FW2-NT	X		X	X	X	X	X	
FW2-TM	X	X	X	X	X	X	X	
FW2-TP	X	X	X	X	X	X	X	
SE1	X					X	X	X
SE2	X					X	X	
SE3	X					X	X	
SC	X					X	X	X
Total # Applicable AUs	952	203	794	815	665	952	952	151

How is the data aggregated?



Each station
evaluated individually

If any station in the
HUC fails to meet
standards the entire
HUC listed as
impaired

Assessment results
presented based on
stream miles, lake
acres, and estuary –
ocean square miles

DO and Temp on the 303 (d) List

Aquatic Life Use is not attained

If any parameter associated with a designated use exceeds the SWQS, the designated use will be listed as not attaining the use.

Pass/Fail by Parameter at the AU level

DO - Station 001 + 002

pH - Station 001 + 003

Temp - Station 001

TP - Station 002

TSS - Station 002

TDS - Station 003

Conservative

Pass/Fail By Station

Station 001 - DO
Station 001 - Temp
Station 001 - pH

Station 002 - DO
Station 002 - TP
Station 002 - TSS

Station 003 - pH
Station 003 - TDS

Assessment Improvements Since 2002

- Integration & leveraging of monitoring, standards & assessment programs and expertise
- Transparent & defined methods
- Increased solicitation and use of external data
- Consistent & useful spatial assessment units – allows progress tracking over time
- Additional & more precise biological data
- More waters assessed overall

New for 2010

- Data submitted electronically via NJ Water Quality Data Exchange System (WQDE)
- Assessment results stored in and reported via USEPA Assessment Database (ADB)
- New Format for Integrated List of Waters
- New HUC 14 Boundaries and AU Total
- New SWQS criteria and/or assessment methods for:
 - Nutrients
 - Temperature
 - pH
 - Fish Consumption (fish tissue)

New Nutrient Assessment Methods

- Now Based Using Multiple Line Of Evidence
- Both Physical/Chemical and Biological Data Required
 - Biological index (macroinvertebrates)
 - Dissolved Oxygen
 - Evaluated against SWQS criteria (minimum DO level)
 - Diurnal DO flux (>3mg/l indicative of photosynthesis)
 - Periphyton Chlorophyll *a* data (seasonal average)

Biology is Impaired

Dissolved Oxygen	Assessment Outcome
No exceedances of criteria; No excessive swing (≤ 3 mg/l)	Nutrients not a cause Place "Cause Unknown" on 303(d)
No exceedances of criteria; Excessive swing present (> 3 mg/l)	Inconclusive regarding nutrients → Evaluate periphyton Chlorophyll <i>a</i> : Seasonal avg. > 150 mg/sq. meter: Nutrients confirmed as cause Place/retain phosphorus on 303(d)
Exceedances of criteria; No excessive swing	Nutrients not a cause; Place DO on 303(d)
Exceedances of criteria; Excessive swing present	Nutrients confirmed as cause Place/retain phosphorus on 303(d)

Where can I find NJ's assessment results?

- WM&S website:

http://www.state.nj.us/dep/wms/bwqsa/2010_integrated_report.htm

- EPA website:

<http://www.epa.gov/waters/ir/>

Milestones for IR

Data solicitation							
Data assessment							
Methods development							
Draft list							
Final list and report							
EPA approval							
Adoption							

Final Methods and Draft 303(d) list

DUE to EPA April 1

Status of the 2010 Integrated Report

Still pending for 2010

DEP responding to EPA comments

EPA approval

Adoption as an amendment to the WQMP

Schedule for 2012 IR

- ✓ Data solicitation – April 2011
Data received from 16 organizations

NEXT STEPS

Methods Document	December 2011
Draft Integrated Report	April 2012
Final Integrated Report	August 2012

For More Information...

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www.state.nj.us/dep/wms/bwqsa/generalinfo.htm