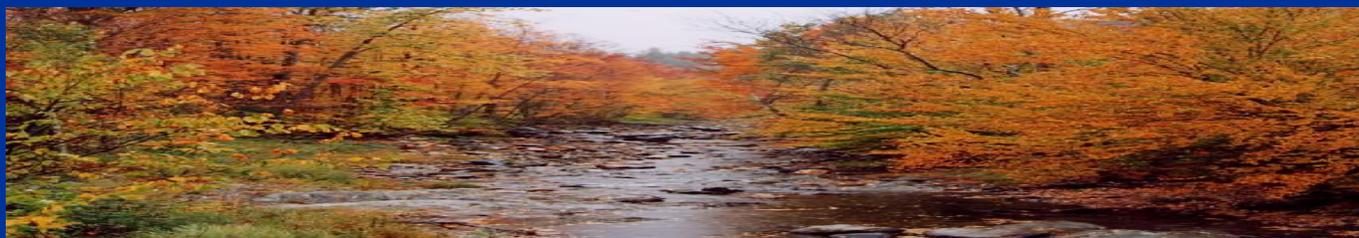


WATER QUALITY DATA COLLECTION: THE WATER QUALITY STANDARDS PERSPECTIVE

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NJDEP Water Monitoring and Standards

Overview

- Water Quality Standards and monitoring as part of water resource management
- Water Quality Standards
- Monitoring choices to evaluate compliance
- Exposure periods for aquatic life
- Other critical constituents
- Rolling up the monitoring results into the Integrated Report/List



Water Resource Management



* Integrated Water Quality
Monitoring & Assessment
Report - Sublist 5



Water Quality Standards

- General policies
 - Antidegradation
 - Mixing Zones
 - Variances
 - Technical implementation policies
- Designated uses
- Criteria to protect designated uses
 - Narrative
 - Numeric
- Stream Classifications
 - Designated Uses
 - Antidegradation



Criteria

- Acute Aquatic Life Criteria (ALa) – protect from lethal effects which would occur under a short period of time
- Chronic Aquatic Life Criteria (ALc)– protect organisms from longer term impacts on growth and reproduction
- Human Health Criteria – protect public health from exposures from drinking water and/or fish consumption. (HH)
- Narrative criteria – biological, toxicity, nutrients, aesthetics, oil and grease



Assessment Methods

It's not just a comparison to a number but:

- How criteria is expressed – total, dissolved
- An exposure period - in 24 hours
- A frequency of a violation or the percent of time the standard is to be achieved – once in three years or 95% of the time
- The number of samples required
- The design flow at which the criteria is expected to be met.
- Max, Min, geometric mean, average



Aquatic Life Criteria for Toxics

- Acute Aquatic Life criteria expressed as a concentration not to be exceeded
 - Three hour – ammonia
 - Six hour period – Cadmium, Chromium, Lead, Nickel, Silver, Zinc
 - 24 hour period – copper
 - One hour – Dissolved oxygen and all other toxics
- Metals expressed as dissolved
- Most are formula derived
- Grab samples are usually adequate



Aquatic Life Criteria for Toxics

- Chronic Aquatic Life criteria expressed an average concentration
 - 24 hours average – Dissolved oxygen
 - Four day average – most toxics
 - Thirty day average – ammonia
- Metals expressed as dissolved
- Most are formula derived
- Grab samples may not be sufficient

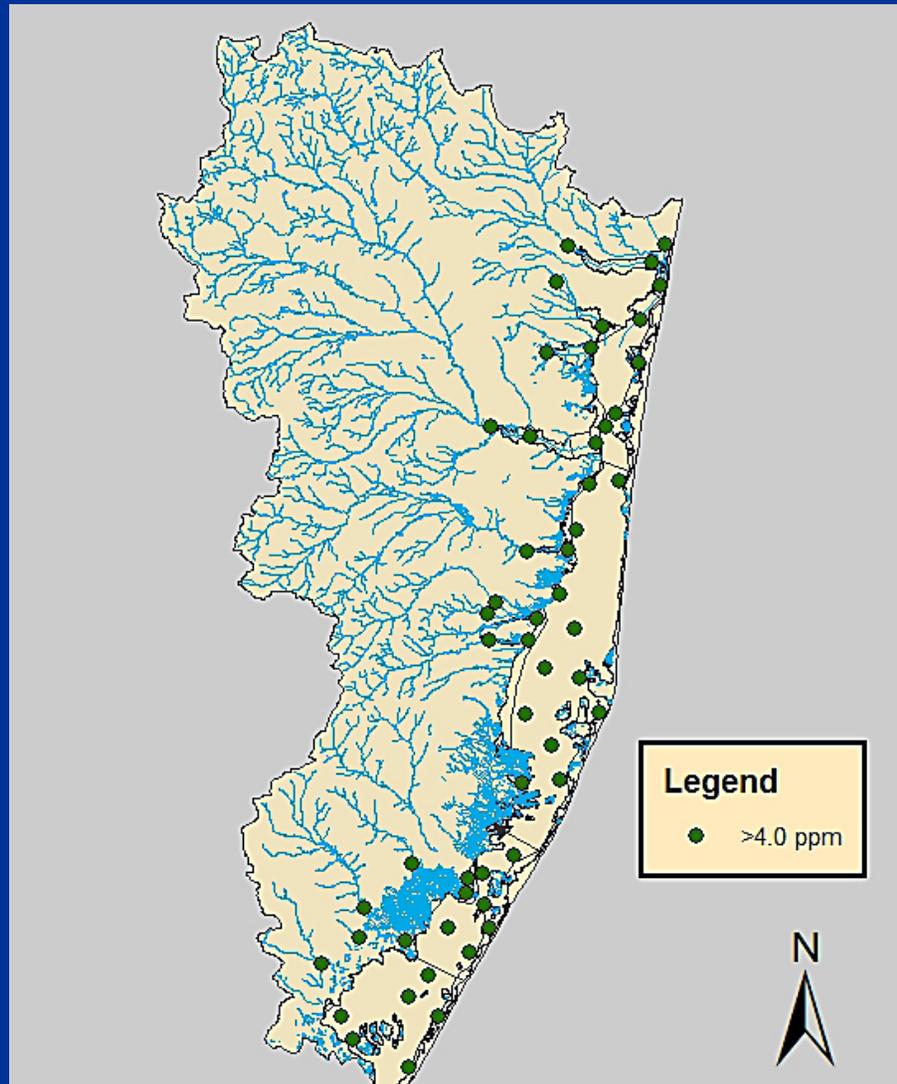


Human Health Criteria

- Carcinogens – the exposure period is long term -
 - 70 years
 - Average all results and compare
- Non-carcinogens
 - Instant – Nitrate
 - 30 Day average – unionized ammonia
- Usually expressed as total



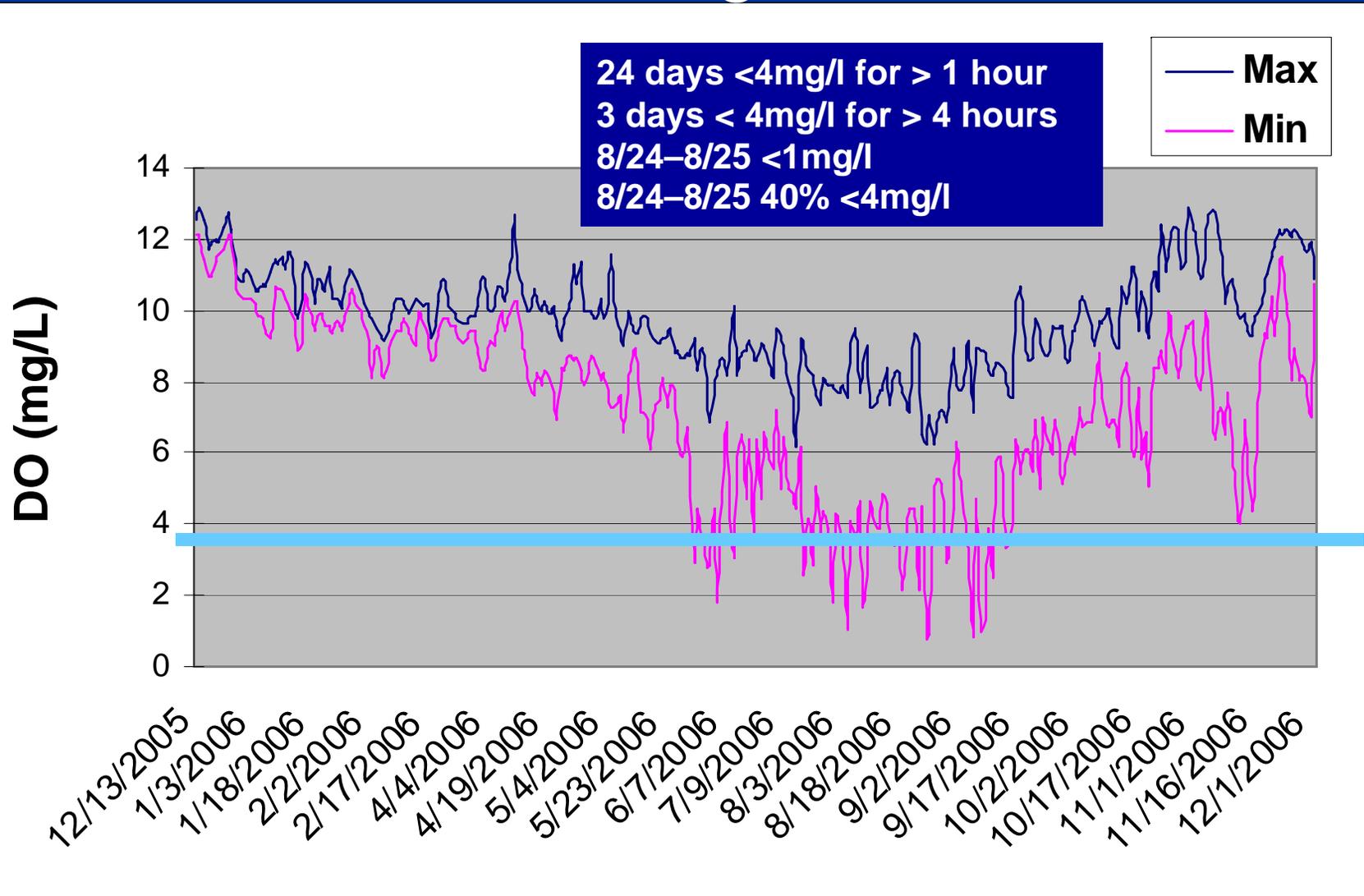
Dissolved Oxygen – Grab Sampling



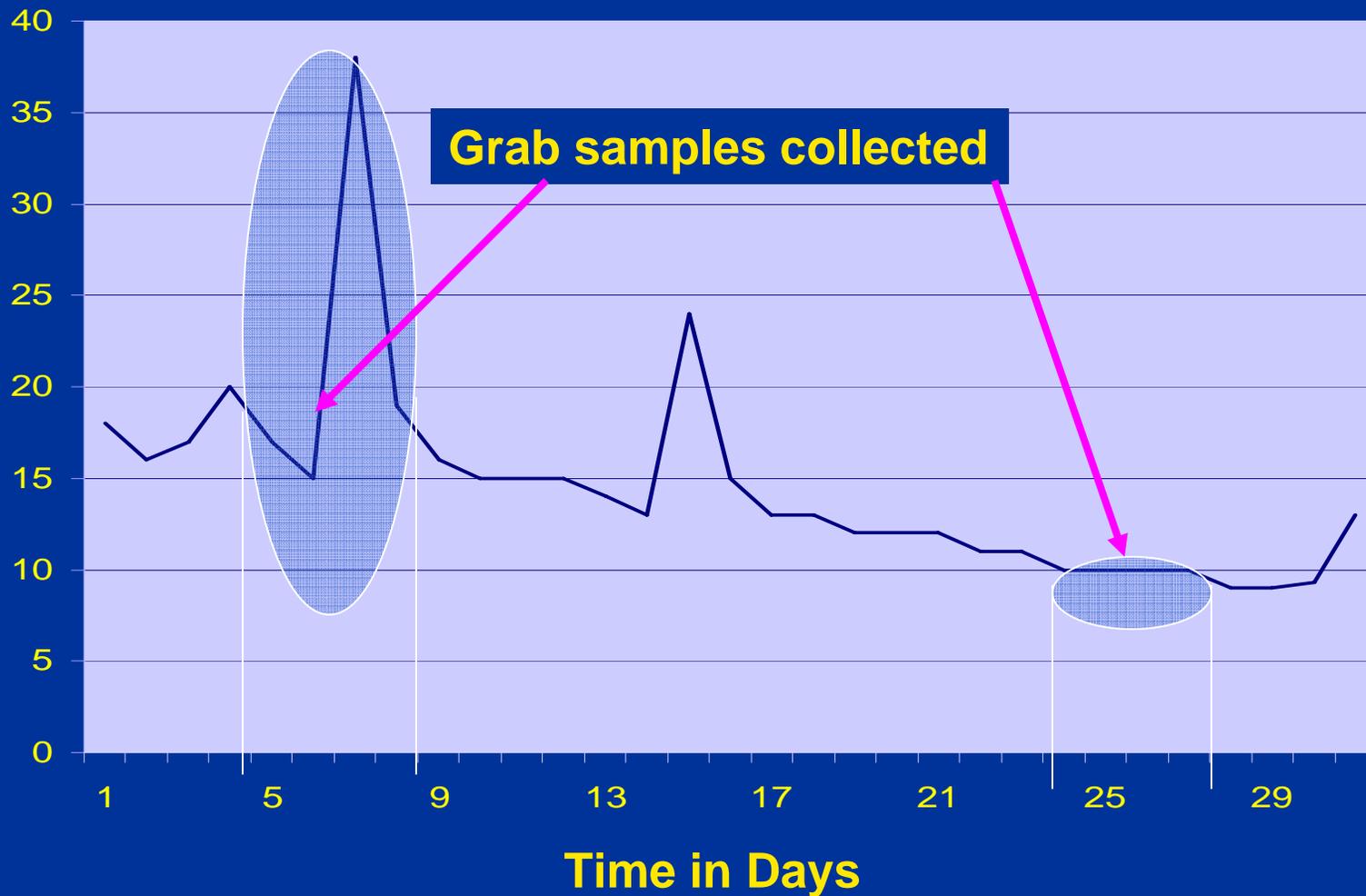
- Aquatic Life criteria
 - Dissolved oxygen concentration never less than 4 mg/L
 - Daily Average concentration of 5 mg/L
- Grab sampling indicates criteria is met
- However, monitoring fails to capture the critical conditions



Continuous Dissolved Oxygen Monitoring Results



Rainfall Impacts on Streamflow

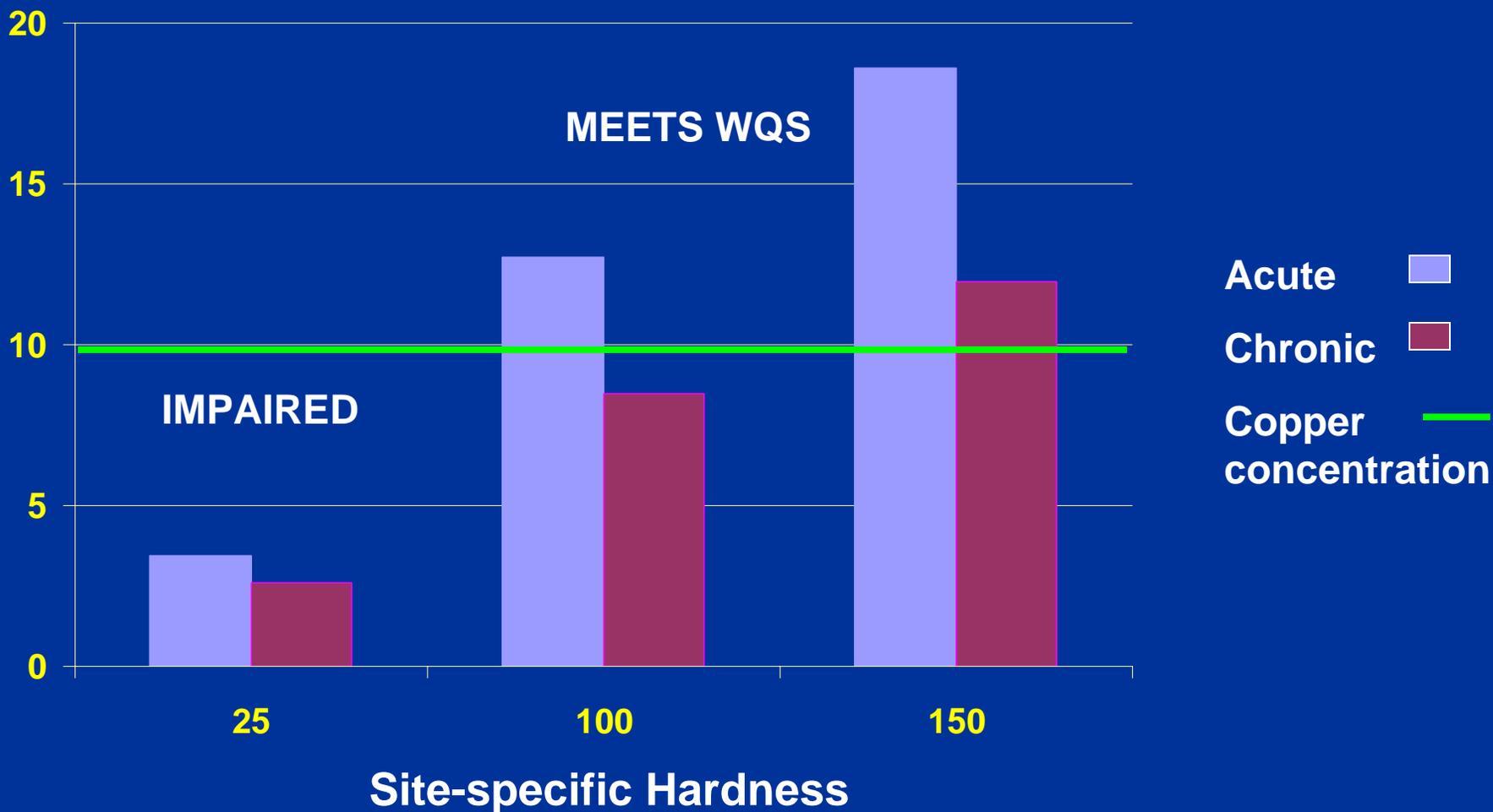


Sampling for other constituents to derived formula-based criteria

- Metals
 - hardness
- Unionized Ammonia
 - pH
 - temperature
- Copper -new EPA recommended BLM
 - Temperature
 - pH
 - Dissolved Carbon
 - Alkalinity
 - Calcium
 - Magnesium
 - Sodium
 - Potassium
 - Sulfate
 - Chloride



Copper Criteria based on Site-specific Hardness



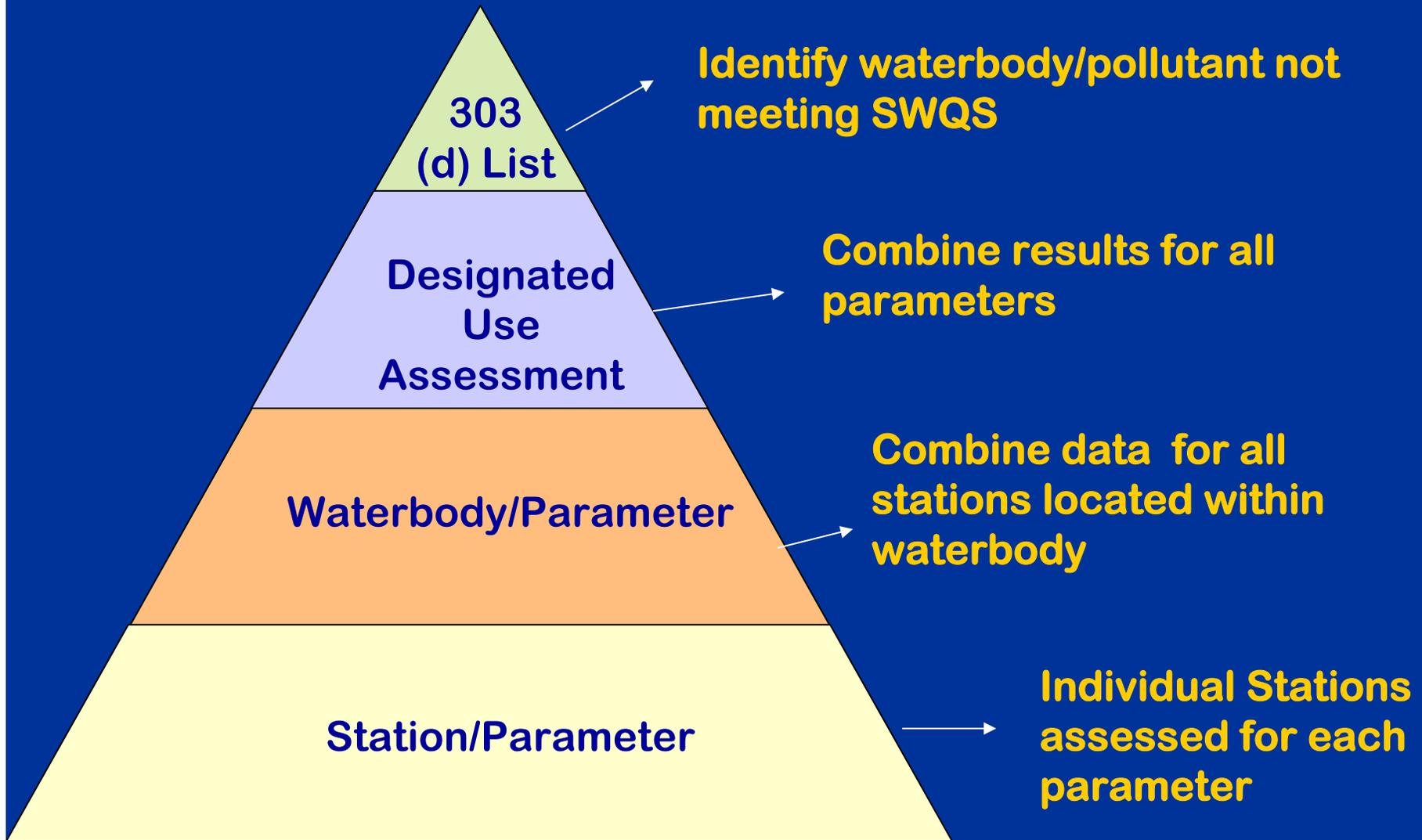
Quality Assurance Project Plans

QAPPs are reviewed to ensure that the data generated can be used in the assessment process

- Appropriate sample frequency
- Adequate number of samples
- Supplemental parameters
- Analyzing with approved methods



Assessment Process



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