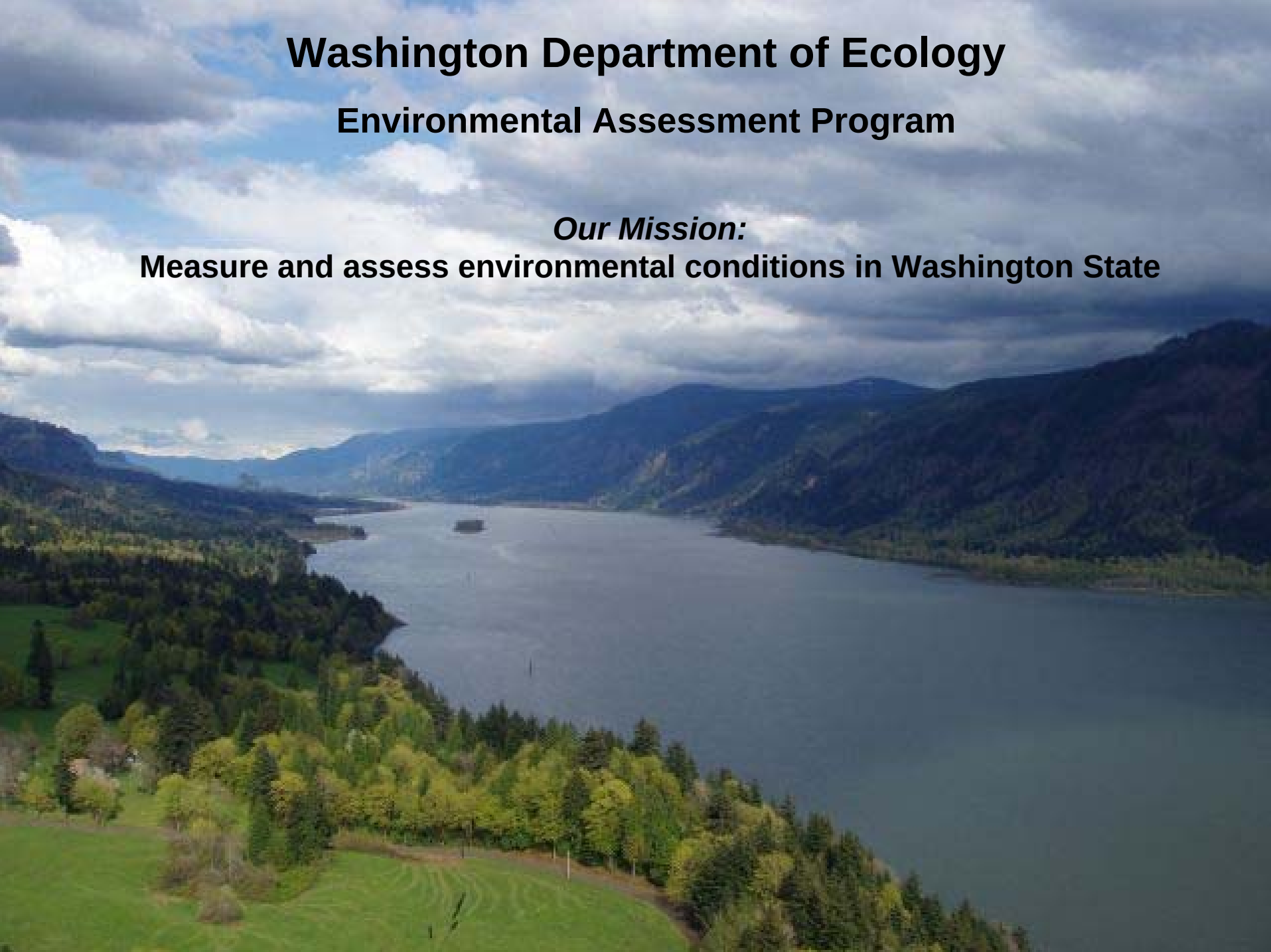

# Washington Department of Ecology

## Environmental Assessment Program

***Our Mission:***

**Measure and assess environmental conditions in Washington State**


# Clean Water Act Monitoring Strategy for Washington State

October 2005

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## Clean Water Act §106(e)(1)

*"States receiving Section 106 funds must monitor the quality of navigable waters."*

## 40 CFR Part 35.168(a)

*§35.168 Award limitations.*

*(a) The Regional Administrator may award section 106 funds to a State only if:*

*(1) The State monitors and compiles, analyzes, and reports water quality data as described in section 106(e)(1) of the Clean Water Act;*

# Elements of a State Water Monitoring and Assessment Program

March 2003 EPA 841-B-03-003

Cover photos courtesy of USDA NRCS

**Assessment and Watershed Protection Division**
**Office of Wetlands, Oceans and Watershed**
**U.S. Environmental Protection Agency**

## March 2003:

- **EPA issued guidance describing 10 elements that should be included in a state monitoring program.**
- **Assumes states would need 10 years to develop and implement a monitoring program fully supporting state decision needs.**
- **FY2004 – States must commit to develop a monitoring strategy**
- **FY2005 – States expected to incorporate activities needed to upgrade their monitoring programs into Section 106 grant work plans and Performance Partnership Grants.**

# The 10 Elements of a State Water Monitoring and Assessment Program
**(*from EPA 2003*)**

1. **Monitoring Program Strategy**
   - *Framework*
   - *Priorities*
2. **Monitoring Objectives**
3. **Monitoring Design**
4. Core and Supplemental Water Quality Indicators
5. Quality Assurance
6. Data Management
7. Data Analysis/Assessment
8. Reporting
9. Programmatic Evaluation
10. General Support and Infrastructure Planning

# Monitoring Strategy Framework *(what guides our strategy?)*

**3 Primary Sources:**

1. **Ecology's 2005-2007 Strategic Plan *(Ecology 2004)* –***includes Water Quality Program's 2005-2007 Program Plan and 2001-2013 Strategic Plan, and Environmental Assessment Program's 2005-2010 Strategic Plan*
2. **Ecology-EPA 2006-2007 Environmental Performance Partnership Agreement** *(Ecology 2005)*
3. **The Washington Comprehensive Monitoring Strategy** (*CMS 2002)*

**Inter-jurisdictional Coordination:**

1. **Governor's Monitoring Forum**
2. **Puget Sound Action Team**
3. **Pacific Northwest Aquatic Monitoring Partnership**

# Monitoring Strategy Priorities *(What are our monitoring priorities?)*

1. Complete TMDLs in accordance with the 1998 Agreement
2. Meet CWA requirements for monitoring and reporting
   - Water Quality Assessment integrated report (303(d)) list
   - Nonpoint program reports
   - Effectiveness monitoring for TMDLs
3. Evaluate BMPs and their effectiveness in representative watersheds
4. Meet remaining CWA expectations:
   - Develop a representative, statewide monitoring network for status reporting (305(b))
   - Address gaps in lake, groundwater, wetlands, and toxic monitoring
5. Begin implementing CMS
6. Coordinate WQ monitoring externally
   - Governor's Forum on Monitoring (Exec Order),
   - Performance Partnership Agreement
   - Puget Sound Action Team
7. Honor monitoring commitments tied to dedicated funding, grants, etc.

## Monitoring Objectives *(What questions are we trying to answer?)*

***From EPA's Guidance:***

1. **What is the overall quality of waters in the state? *(status)***
2. **To what extent is water quality changing over time? *(trends)***
3. **Where are the problems and areas needing protection? *(site identification)***
4. **What level of protection is needed?**
5. **How effective are clean water projects and programs**

# Monitoring Design *(how will we meet the monitoring objectives?)*

**Key Point:** Different monitoring designs are needed to address different monitoring objectives, or to address objectives at different geographic or temporal scales

**For each monitoring objective:**

**We compared the monitoring objective to current programs**

- Compared key measures
- Evaluated current monitoring programs
- Identified gaps in monitoring programs
- Identified near-term and longer-term strategies to address gaps

# Clean Water Act Monitoring Strategy – Table 3, pg 18

| Clean Water Act Questions and Measures | Ecology Monitoring Program |
|---|---|
| **1. What is the overall quality of waters in the state?**<br>What % of stream miles are meeting water quality standards/supporting beneficial uses?<br>What % of estuary acres are meeting water quality standards/supporting beneficial uses?<br>What % of lake acres are meeting water quality standards/supporting beneficial uses? | Marine sediment monitoring program<br>Several federally-funded EMAP-style projects have been conducted, but funding has expired. A BPA-funded project is underway in the Wenatchee basin thru 2008. |
| **2. To what extent is water quality changing over time?**<br>How are the questions raised under #1 changing over time? | Freshwater river and stream ambient fixed stations<br>Marine ambient water quality fixed stations<br>Marine sediment fixed stations<br>Ambient bioassessment reference stations |
| **3. Where are the problem areas and areas needing protection?**<br>Where are the impaired waters of the state? What are the causes and sources of impairment?<br>Where are the waters that are currently of high quality (reference sites?) | Freshwater annual basin targeted stations<br>Marine annual targeted stations<br>Ambient bioassessment annual targeted stations<br>Invasive aquatic plants monitoring<br>BEACH program<br>Toxics in fish tissue studies<br>Intensive studies (including TMDL studies)<br>Integrated water quality assessment |
| **4. What level of protection is needed?**<br>For impaired waters, what beneficial uses are attainable (use attainability analyses)?<br>What should the effluent limits in NPDES permits be to meet water quality standards?<br>For impaired waters, what are the appropriate wasteload allocations? | Intensive studies<br>TMDL studies<br>NPDES monitoring |
| **5. How effective are clean water projects and programs?**<br>Are waters with Section 319 projects (or categories of projects) improving?<br>What % of waterbodies listed as impaired on the 2000 303(d) list have been restored?<br>Are impaired segments meeting water quality standards?<br>In watersheds with approved TMDLs:<br>Is water quality improving?<br>Are interim and/or final TMDL targets being met?<br>Are additional implementation measures needed?<br>Are point source dischargers meeting their NPDES limits? | Freshwater river and stream ambient monitoring<br>Marine ambient monitoring<br>Stream ambient bioassessment monitoring<br>Invasive aquatic plant monitoring<br>BEACH monitoring<br>Toxics in fish tissue studies<br>Discharge monitoring reports<br>TMDL effectiveness monitoring studies<br>Intensively monitoring watersheds<br>Forests and Fish effectiveness monitoring |

# Monitoring Design - *(what is the overall quality of waters in Washington State?)*

**Measures:** **What percent of stream miles, estuary acres, lake acres are meeting water quality standards and supporting beneficial uses?** ***(requires a random, representative sampling design for statistical validity)***

**Current Monitoring Programs:**

- **Puget Sound sediment monitoring program**
- **Various EPA grants supporting EMAP-style probabilistic sampling designs**

**Gaps:**

- **No other statewide programs employ a statistically valid, un-biased, representative assessment of overall water quality condition for rivers, streams, or marine waters.**
- **No established monitoring programs for lakes, wetlands, or groundwater**

**Key Strategies (see document for full list):**

- **Complete the Water Quality Assessment based on available data (PPA 3AC)**
- **Develop a QAMP for a statewide probabilistic monitoring program for wadeable and non-wadeable freshwater rivers and streams (SRFB funds for QAMP)**
- **Report on progress of implementing similar objectives in the CMS (legislature)**
- **Employ more modeling of marine waters to describe estuary status**
- **Engage new monitoring technologies to expand temporal/spatial coverage (e.g. continuously recording temp sensors)**

# Monitoring Design - *(to what extent is water quality changing over time?)*

**Measures: Is the percent of stream miles, estuary acres, lake acres meeting water quality standards changing over time? (*as phrased - requires a random, representative design for statistical validity)***

**Current Monitoring Programs:**

- **Several ambient monitoring programs provide trends *at targeted sites***
- **Various EPA grants supporting EMAP-style probabilistic sampling designs**

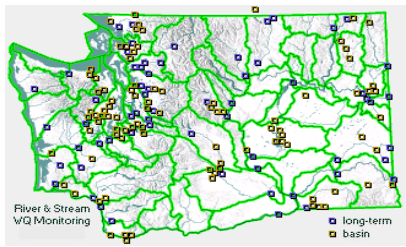
**Gaps:**

- **No statewide programs employ a statistically valid, un-biased, representative assessment of overall water quality condition for rivers, streams, or marine waters.**
- **No established monitoring programs for lakes, wetlands, or groundwater**

**Key Strategies (see document for full list):**

- **Maintain existing long-term ambient monitoring programs**
- **Other strategies essentially the same as previous objective**

*Ecology's freshwater ambient monitoring network includes 62 targeted long-term "core" stations and 20 targeted "basin stations" sampled monthly*




# Monitoring Design - *(what are the problem areas and areas needing protection?)*

**Measures:** Where are the impaired waters of the state?
What are the causes and sources of impairment?
Where are the waters that are currently of high quality?

**Current Monitoring Programs:**

- Intensive sudies
- Water Cleanup Plans (aka TMDLs)
- Various screening-level programs to identify/verify suspected problems
  - Washington State Toxics Monitoring Program
  - Stream biological monitoring
  - Invasive aquatic plant monitoring
  - BEACH program
  - Ambient monitoring “basin stations”

**Gaps:**

- Capacity – funding is insufficient to meet all needs
- Scope –limited monitoring for lakes, wetlands, and groundwater,

**Key Strategies (see document for full list):**

- Complete the Water Quality Assessment based on available data (PPA 3AC)
- Report on progress of implementing similar objectives in the CMS (legislature)
- Develop a strategy for addressing marine TMDLs
- Continue to develop and improve pollution transport and fate models
- Report on progress of implementing similar objectives in the CMS (legislature)

# Monitoring Design - *(what level of protection is needed?)*

**•Measures:**

- **For impaired waters, what beneficial uses are attainable?**
- **What should the effluent limits in NPDES permits be?**
- **For impaired waters, what are the appropriate wasteload allocations?**
- **Which BMPs for nonpoint sources result in meeting beneficial uses?**

**Current Monitoring Programs:**

- **Intensive studies**
- **Water cleanup plans (TMDLs)**

**Gaps:**

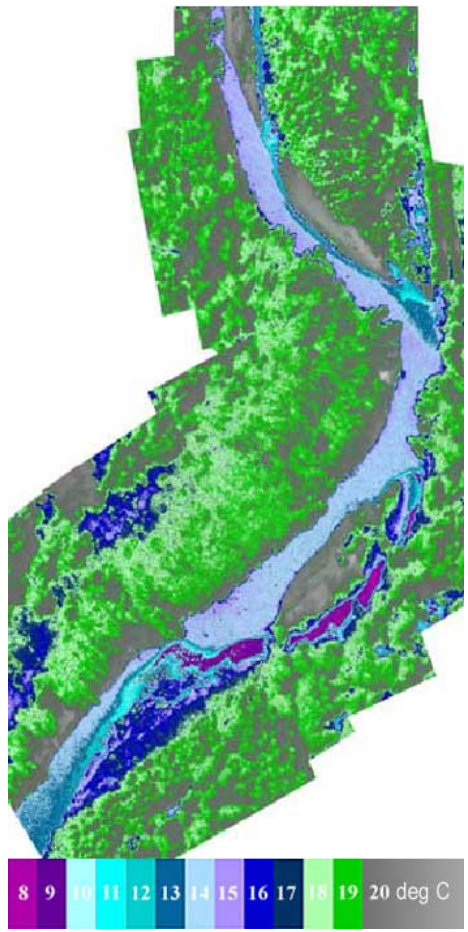
- **Capacity – funding is insufficient to meet all needs**
- **Insufficient knowledge of how effective different BMPs are in cleaning up impaired waters.**

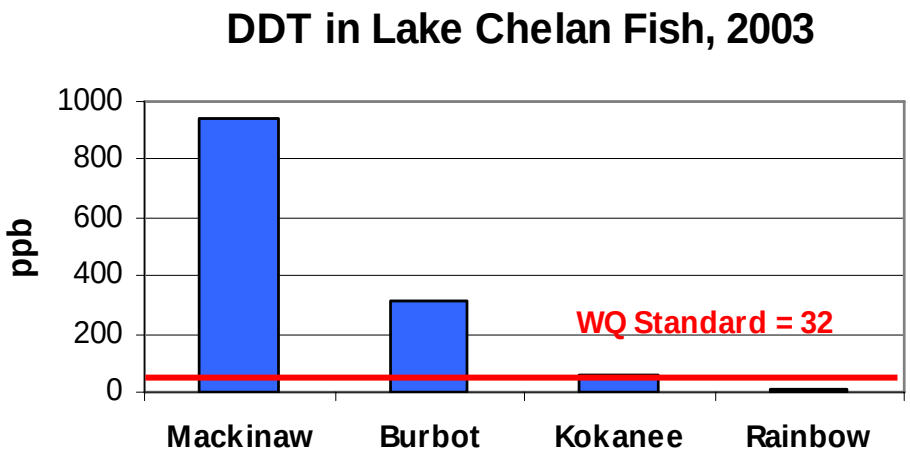
**Key Strategies (see document for full list):**

- **Streamline/standardize TMDLs (PPA element 3B)**
- **Joint workload planning with EPA**
- **Innovative approaches to TMDLs**
- **Conduct research to improve understanding of effects of land-use practices, restoration, BMPs, and other mgt tools on the function of target watersheds.**

# TMDLs and other directed studies

***Thermal infrared image of springs in the North Fork Stillaguamish River*** *(September 7, 2001).*



# Monitoring Design *(How effective are Clean Water projects and programs?*

- **Measures:**
- **What percent of impaired waterbodies have been restored?**
- **Are waters with 319 projects improving?**
- **Are impaired segments meeting WQ standards?**
- **In watersheds with approved TMDLs, are targets being met and is WQ improving?**

**Current Monitoring Programs:**

- **TMDL effectiveness monitoring**
- **Intensively monitored watersheds**
- **Effectiveness monitoring of Forest Practice Rules**

**Gaps:**

- **Capacity – funding is insufficient to meet all needs**
- **Monitoring strategy for stormwater management programs**

**Key Strategies (see document for full list):**

- **Complete the Water Quality Assessment based on available data (PPA 3AC)**
- **Report # of waterbodies removed from the WQ Assessment and 303(d) list**
- **Develop an effectiveness monitoring program for CWA 319 and TMDL needs**
- **Collaborate with local governments and other stormwater permit stakeholders to develop an integrated stormwater monitoring program.**
- **Conduct research or directed studies to evaluate effectiveness of land-use practices, BMPs, land-use (including Forest Practices Monitoring).**

## Key Points

***The Clean Water Act Monitoring Strategy for Washington State:***

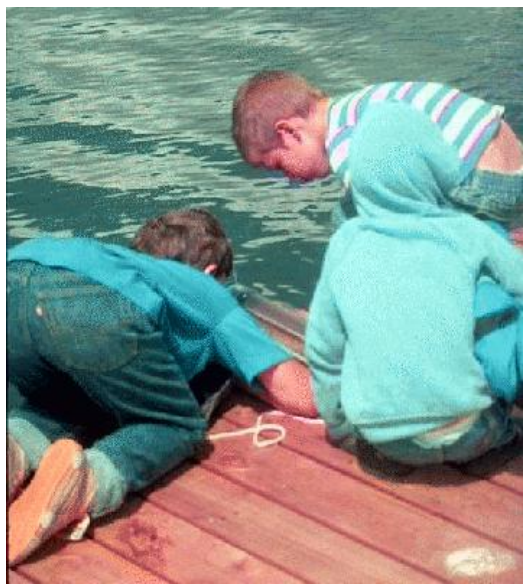
- **Strategic Framework and Priorities**
  - **derived from existing sources – *no new priorities developed for this document***
- **Monitoring Objectives (5 core questions)**
  - **From EPA, but consistent with Comprehensive Monitoring Strategy and Ecology's monitoring objectives**

*Measuring current velocity along a stream cross-section*

## Key Points

***The Clean Water Act Monitoring Strategy for Washington State:***

- **Monitoring Design**
  - **Current programs represent a "tiered" approach to monitoring**
    1. ***Different programs support different objectives and scales***
    2. ***Monitoring supports core management needs***
    3. ***Majority of existing monitoring programs considered "essential" in the Comprehensive Monitoring Strategy***
  - **Gaps mostly in capacity and *scope (related to capacity)***
  - **Strategies to fill monitoring gaps derived from existing strategic plans**



## *The Clean Water Act Monitoring Strategy for Washington State:*

***Key content of remaining 7 elements:***

4. ***Water Quality Indicators***
   - ***Core WQ parameters***

5. ***Quality Assurance***
   - ***Ecology's Quality Management Plan***
   - ***Water Quality Assessment***
   - ***Credible Data Bill***

6. ***Data Management***
   - ***EIM***
   - ***WATS***
   - ***WPLCS***
   - ***LIMS***
   - ***SedQual***

7. ***Data Analysis and Assessment***
   - ***Water Quality Assessment Report***

## *The Clean Water Act Monitoring Strategy for Washington State:*

***Key points of remaining 7 elements:***

8. ***Reporting***
   - ***Water Quality Assessment Report***
   - ***Condition of Fresh Waters in Washington State***
   - ***Puget Sound Update***

9. ***Programmatic Evaluation***
   - ***Performance Partnership Agreement***
   - ***GMAP***
   - ***CMS Review***
   - ***PSAMP Reviews***

10. ***General Support and Infrastructure Planning***
   - ***EAP is primary monitoring arm of Ecology***
   - ***Manchester Environmental Laboratory***

***References, Appendices (including a catalog of monitoring programs, and monitoring action items listed in the Comprehensive Monitoring Program)***

**Clean Water Act Monitoring Strategy for Washington State**

***http://www.ecy.wa.gov/biblio/0503034.html***