Sediment Quality Update

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Topics

- **Background**
- **Program accomplishments**
- **Recent progress**
- **Next steps**

Background

- **Sediment quality has been a research focus throughout SCCWRP's history**
  - **Key role in contaminant fate and effects**
  - **Long-term research emphasis by SCCWRP**
  - **Focus of most monitoring and regulatory programs**
- **Sediment monitoring and management programs are challenged by technical issues**
  - **Complex mixtures**
  - **Monitoring methods lag behind state of science**
  - **Difficult to relate chemistry to biological impacts**

CA Sediment Quality Objectives

- **Narrative objectives (SQOs) for protection from direct and indirect effects of contamination**
  - **Aquatic life (benthic community)**
  - **Humans (food web exposure)**
- **Water Board enlisted SCCWRP to develop technical foundation for SQO assessment and implementation**
  - **Statewide application and comparability**
- **Tools and guidance needed to assess sediment quality and determine compliance with SQO**
  - **Major focus of research efforts**

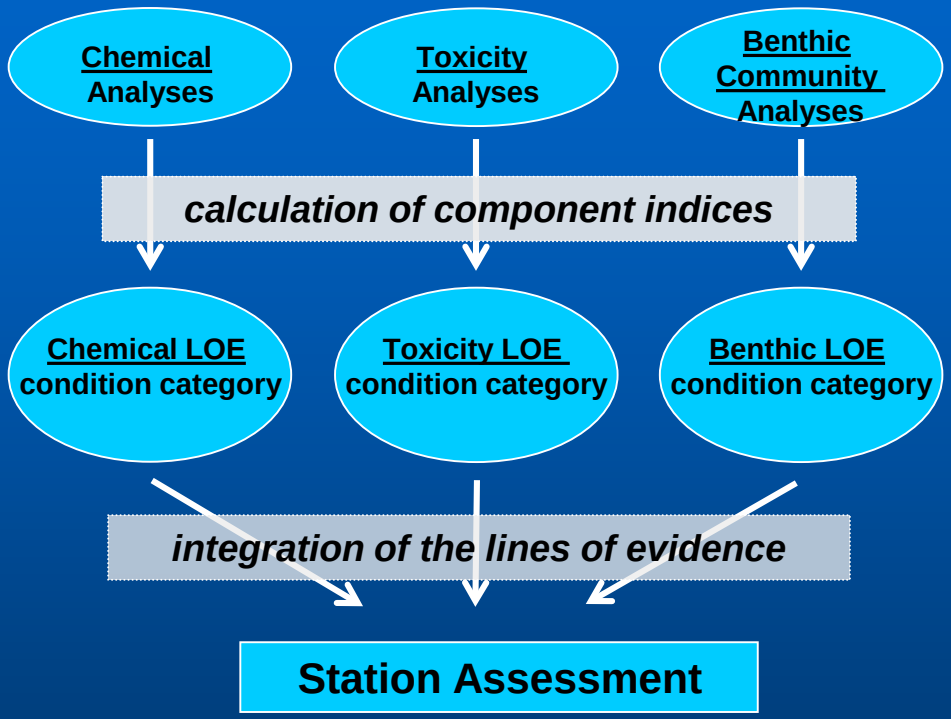
Approach

- **Developing methods/assessment consistency**
  - **Evaluate and select indicators/lines of evidence**
  - **Incorporate local scientific knowledge**
- **Standardizing data interpretation**
  - **Establish quantitative thresholds for each indicator**
  - **Develop framework for integrating across lines of evidence**
- **Validation and communication**
  - **Case studies**
  - **Advisory and review committees**
  - **Training**

Research Program Elements

- **Assessment framework & tool development**
  - **Aquatic life: sediment quality triad (adopted in 2009)**
  - **Human health: bioaccumulation and health risk (final refinement in progress)**
- **Interpretation assistance**
  - **Assessment framework and implementation guidance**
  - **Stressor identification**
- **Implementation support**
  - **Training and analysis tools**
  - **Case studies**

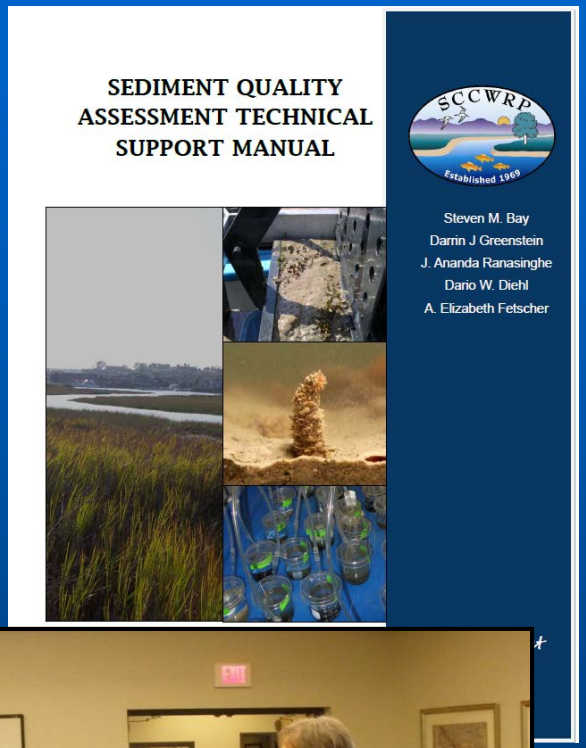
Aquatic Life SQO Assessment Framework



- Only state with sediment quality objectives
- Fully developed only for marine embayments
- Giant leap forward for assessment and management

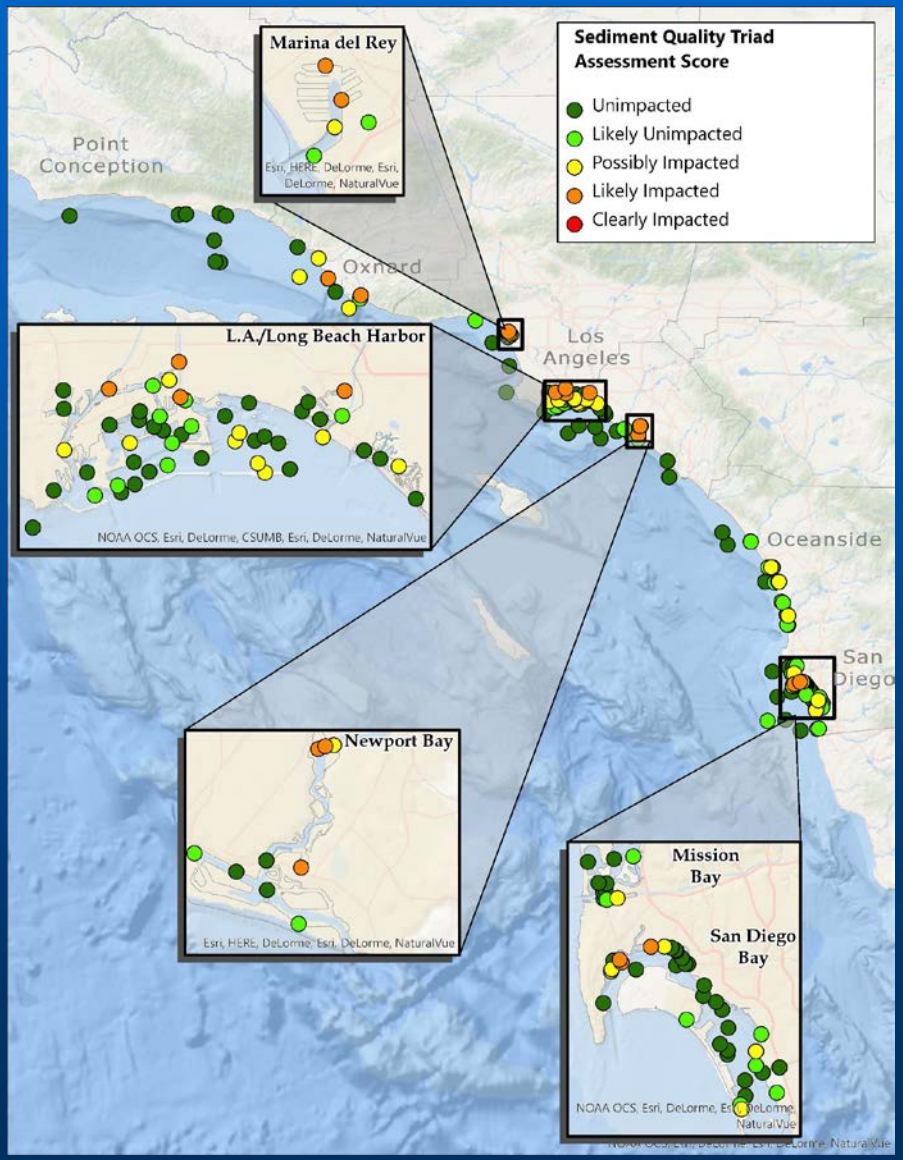
Technology Transfer

- **Technical support manual**
  - **Method and study design reference**
- **Data analysis tools**
  - **Excel workbooks to promote consistent application and interpretation**
  - **SQO support page on SCCWRP web site**
- **Training**
  - **Hands on workshops for regulators, managers, consultants**

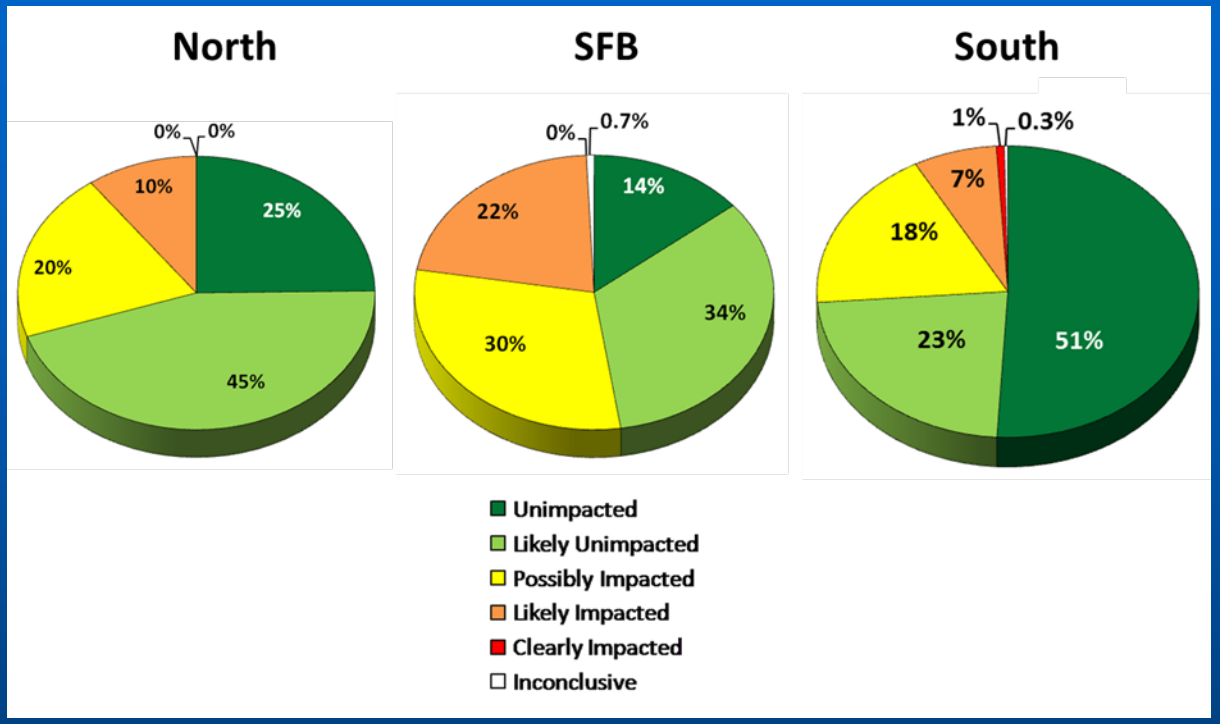


Regional Monitoring Implementation

- **Evaluation of Southern California sediment quality in a consistent manner**
  - **Since 2008**
- **Standardized assessment enables focus on remediation**
- **Prioritize sites**



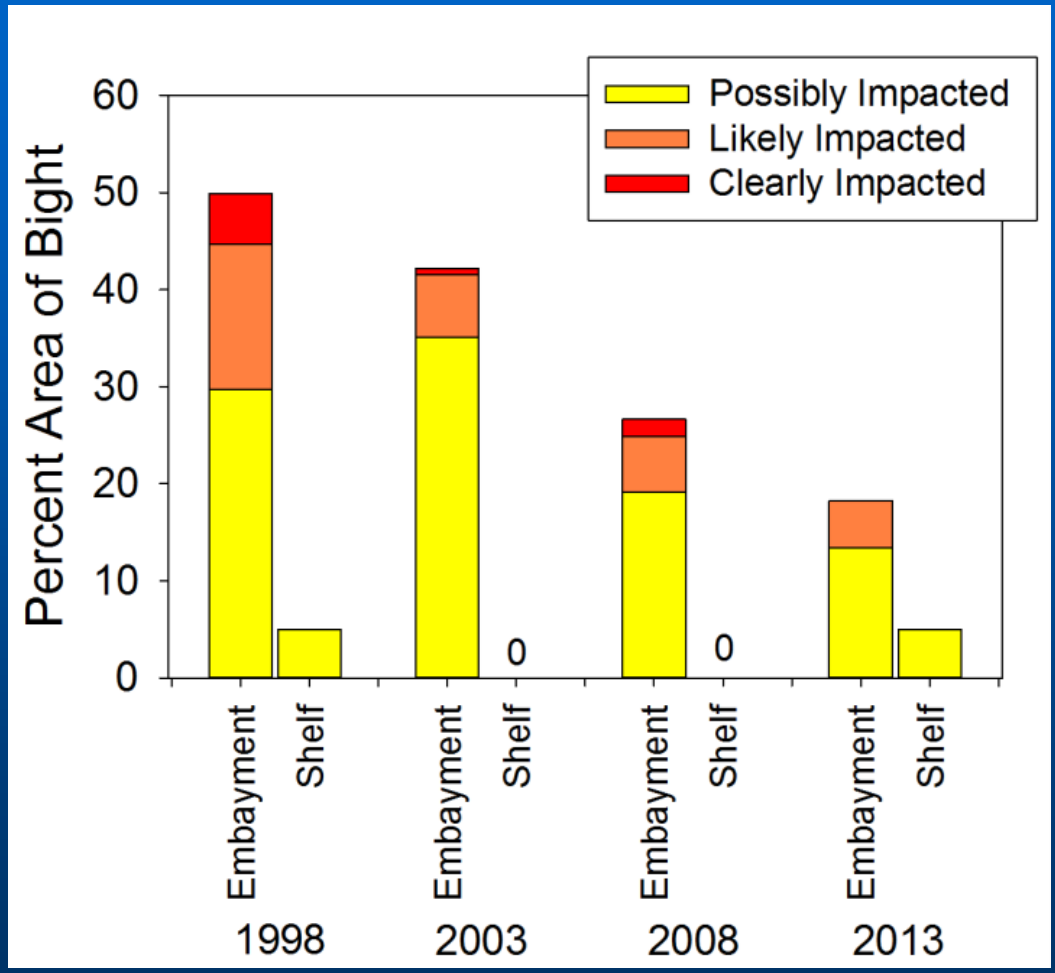
Statewide Perspective: 2005-12



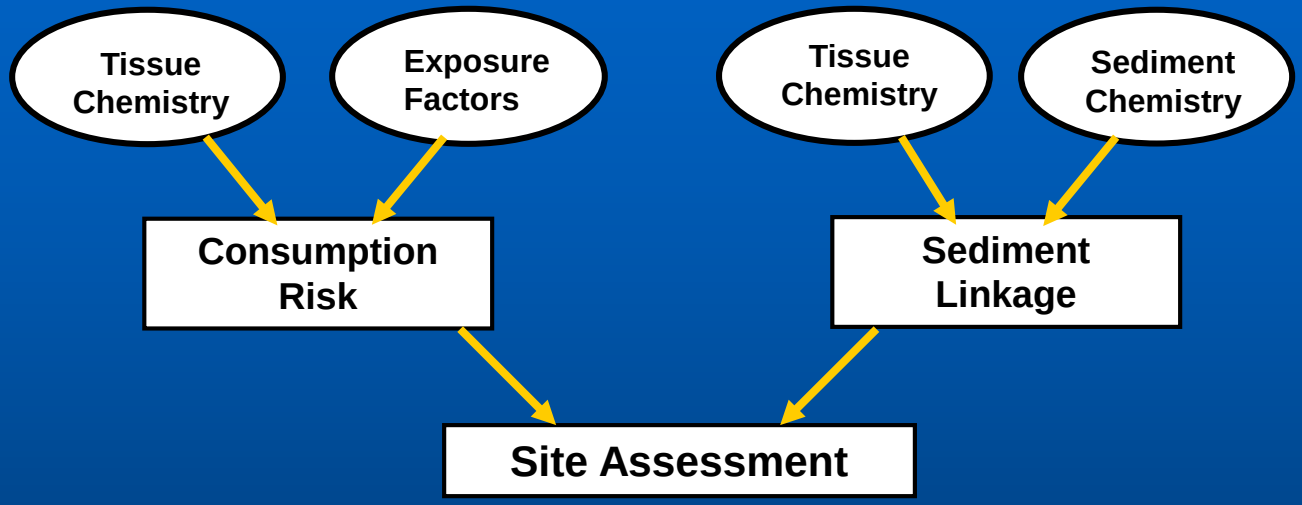
Coordination with other regional monitoring programs allows comprehensive assessment of sediment quality at an unprecedented level of resolution

Management Effectiveness

- **Retrospective assessment indicates effectiveness of environmental management actions in embayments**
- **Interest in refining tools for offshore assessments**



Human Health SQO Assessment Framework



- **Final refinement of framework underway**
  - **2017 consideration for adoption into water quality control plan**
- **Already being utilized in TMDLs and case studies**
  - **Facilitates human health impact assessment in monitoring and regulatory programs**
  - **Achieves consistency and comparability among water bodies**

Recent Accomplishments

- **Progress in all priority research areas identified by CTAG**

Two examples:

- **Improving benthic community assessment tools**
  - **Development of a general application index for national coastal assessments**
- **Implementation of SQOs in regulatory programs**
  - **Greater LA and LB Harbors TMDL**

Benthic Community Assessment

- **Assessing the condition of infaunal communities provides a direct measure of aquatic life health**
- **Benthic indices synthesize community data and present it in a context of sediment quality**
  - **Distills information into condition scores to facilitate communication and use**
- **Lack of benthic community assessment tools limits sediment quality assessment**
  - **Most benthic indices are habitat specific**
  - **Salinity and geographical variations limit application and data comparability**

Benthic Index Refinement

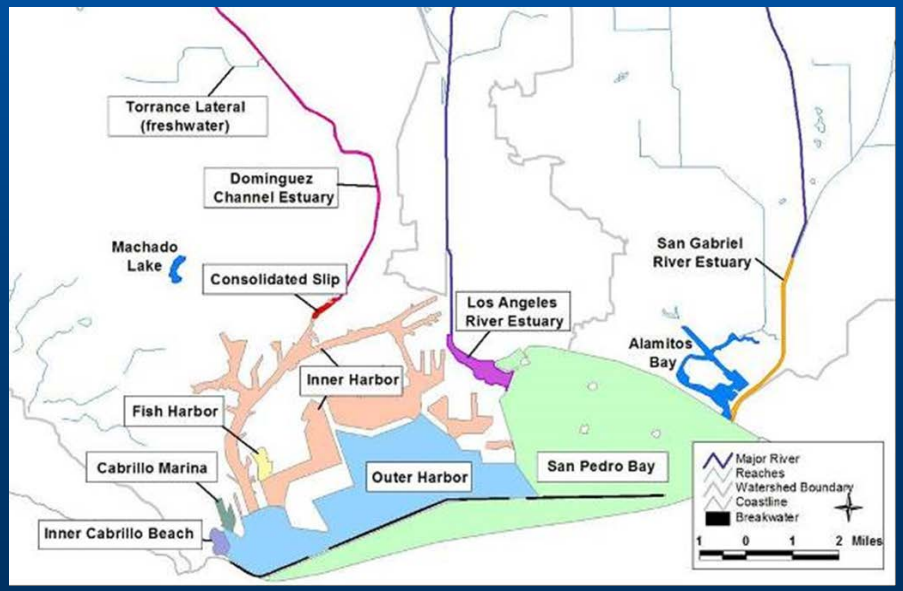
- **Benthic index use in National Coastal Condition Assessment is not standardized**
  - **Each coastal region uses a different index**
  - **EPA asked for SCCWRP's help to improve comparability**
- **SCCWRP coordinated an expert panel to develop a general use index**
  - **Adapted European AMBI (AZTI Marine Biotic Index)**
  - **Incorporated measures of species diversity to develop a multivariate index (M-AMBI) with improved performance**
- **M-AMBI index shown to be applicable to multiple US habitats**

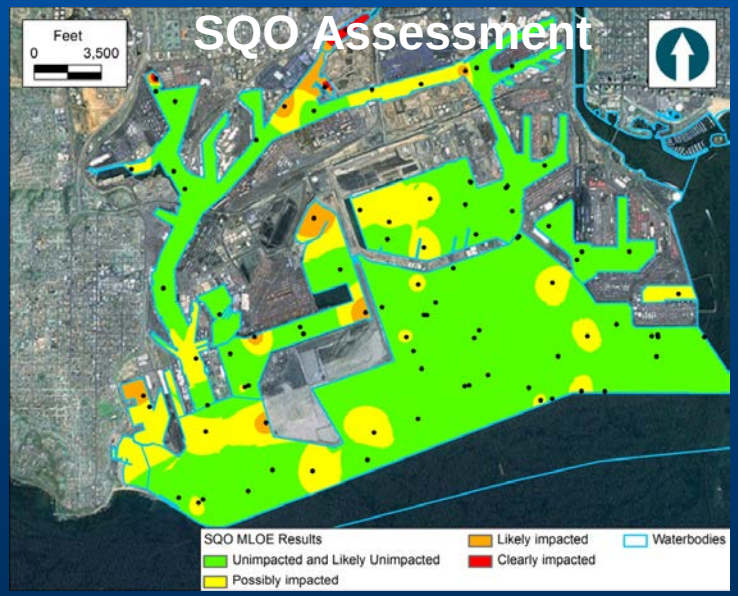
National Index Implementation

- **US EPA has adopted our refined M-AMBI for future National Coastal Condition Assessments**
  - **Illustrates national impact of SCCWRP sediment quality research**

SQO Implementation: LA/LB Harbors TMDL

- **First incorporation of both aquatic life and human health SQOs into a TMDL**
  - **Multiple toxics of concern**
  - **Option to meet cleanup targets based on SQO outcome**
  - **Need for implementation and compliance guidance**



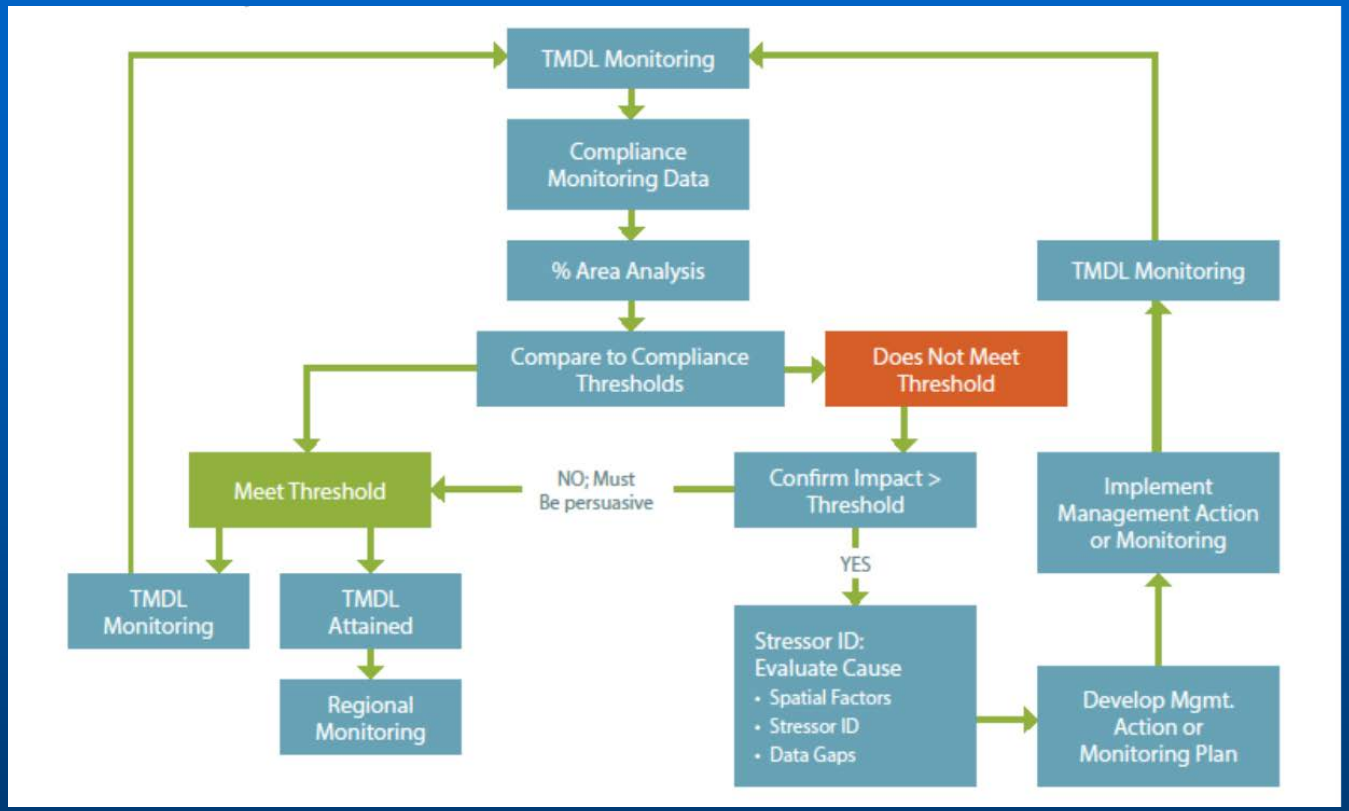


Anchor QEA

Implementation Test Drive

- **Harbor Technical Work Group established to coordinate and resolve SQO implementation issues for TMDL**
  - **Ports, SCCWRP, LARWQCB, State Water Board, contractors**
  - **Test bed to develop guidance in a complex system**
- **Endorsed by ports**
  - **Potential to develop more effective monitoring and remedies**
  - **Conducting research to support decisions**
    - **Will benefit SQO implementation in other areas**

Aquatic Life SQO Compliance



- **Developed process and thresholds for implementation of aquatic life SQO assessments as a method of TMDL compliance**

Additional Implementation Progress

- **Compliance framework for human health SQO**
- **Bioaccumulation model evaluation and refinement**
- **Criteria to justify use of alternate assessment approach or bioaccumulation model (Tier III)**
- **Monitoring program requirements**
- **Study design guidance**
- **Influence of background (offsite) contamination**

Summary

- **SCCWRP sediment quality research has had impacts at local, state, and national levels**
  - **California is the national leader in sediment quality research and implementation**
- **Progress has been made on many of priority topics identified by SCCWRP and CTAG in 2014**
  - **Human health SQO assessment framework and tools**
  - **Implementation of SQOs increasing**
- **Stressor identification application through case studies**
- **Research needs still exist**

Next Steps

- **CTAG and SCCWRP reaffirmed sediment quality priorities at November meeting**
  - **Better stressor identification tools**
    - **Especially new/molecular methods**
  - **Bioaccumulation model development**
    - **Evaluate performance and extend applicability.**
  - **Improved benthic indices**
    - **Update and expand to other habitats**
  - **Regulatory program implementation guidance**
    - **TMDLs and clean up**
  - **Improved chemistry indices**
    - **Incorporate measures of bioavailability**