



Navy TMDL Technical Guidance: FY2004 Mid-Year Status

Year 2 Deliverable: Completion of Final Technical Guidance for Assessing the Top TMDL Constituents

Technical POC:SSC-SD 2362, 619-553-2808

Management POC:SSC-SD 23601, 553-5403

Presented 18 May 2004

Introduction

- **Project Objective:** Provide a guidance document that maps out the appropriate technical approaches for developing TMDLs in a cost-effective and scientifically defensible manner.
 - Customer: Navy shoreside commands and activities, along with the Navy Watershed/TMDL Workgroup and the Fleet, Navy personnel...
- **EQ Requirements:**
 - 2.II.01.q Control/Treat Industrial Wastewater Discharges
 - 2.II.02.c: Nonpoint Source Discharge Identification(M)
 - 2.II.01.k: Control/Treat Nonpoint Source Discharge(M)
 - **Proposed: Reduce WQ compliance impacts with Site-Specific Criteria, Mixing zone analyses, and other Effluent/Receiving Water studies**

Problem Statement

Navy Impact

- **NAVFAC Phase I Screening Rpt (2002): “...the impact to the Navy due to TMDL development will be increasing steadily over the next ten years...” 124 Activities, 164 waterbodies, >500 listings**
- **NAVFAC Phase II Prioritization Rpt (2003): “...identified 305 TMDL impacts to the Navy: 72 hi-priority, 118 medium, 115 low”**
- **States required to list and prioritize all waterbody impairments biannually, develop TMDLs where WQ criteria have not been met**
 - » **Driven by lawsuits by citizen & environmental groups**
 - » **Ph II Pri Rpt now outdated...lists due to come out now for CY04**
- **TMDL = Point Sources (WLA) + NonPoint Sources (LA) + Margin of Safety (MOS)**
 - » **MOS accounts for uncertainty (info/data, future growth & changes)**
 - » **If insufficient data, EPA/State imposes a large MOS => meaning stricter regulatory controls & lower NPDES limits**
- **Technical guidance at federal and state levels lacking and uncoordinated and there is a need for Navy-specific guidance for cost savings and avoidance**
 - » **Lead time needed to educate front-line Navy personnel to effectively participate in stakeholder process**

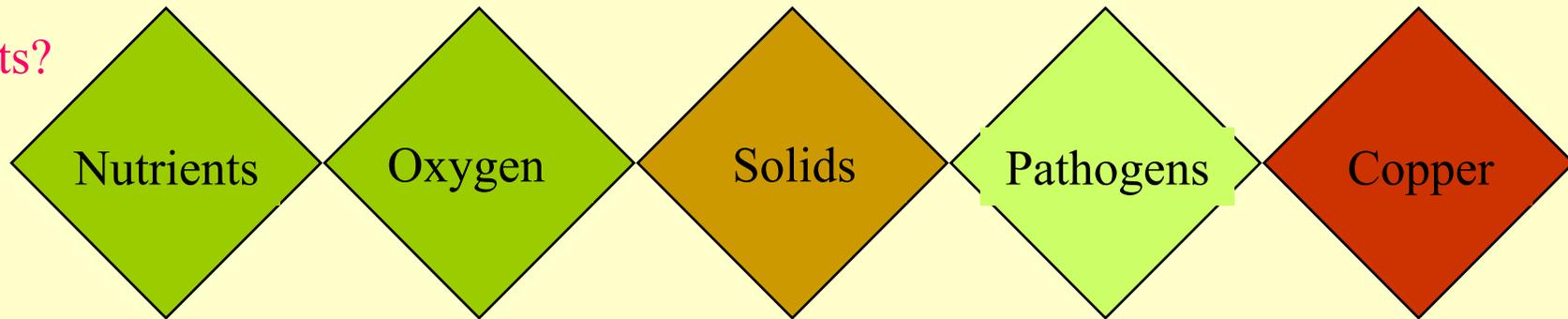
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- **TMDL = Point Sources (WLA) + NonPoint Sources (LA) + Margin of Safety (MOS)**
 - » MOS accounts for uncertainty (info/data, future growth & changes)
 - » TMDL is fixed. If insufficient data, EPA/State imposes a large MOS => meaning stricter regulatory controls & lower NPDES limits
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Overall Technical Approach – Conceptual Diagram

Which
Pollutants?



How is Guidance
Developed?

1. Compile information
2. Review, assess, define tech approaches and issues
3. Obtain expert evaluation/peer review
4. Develop recommendations & guidance

Using What
Resources?

1. Federal Guidance TMDLs
2. State Guidance TMDLs
3. Influencing Regulatory Programs
4. Scientific/Grey Literature
5. Case Studies

When
Used?

**Listing &
Delisting**

**Development
of TMDLs**

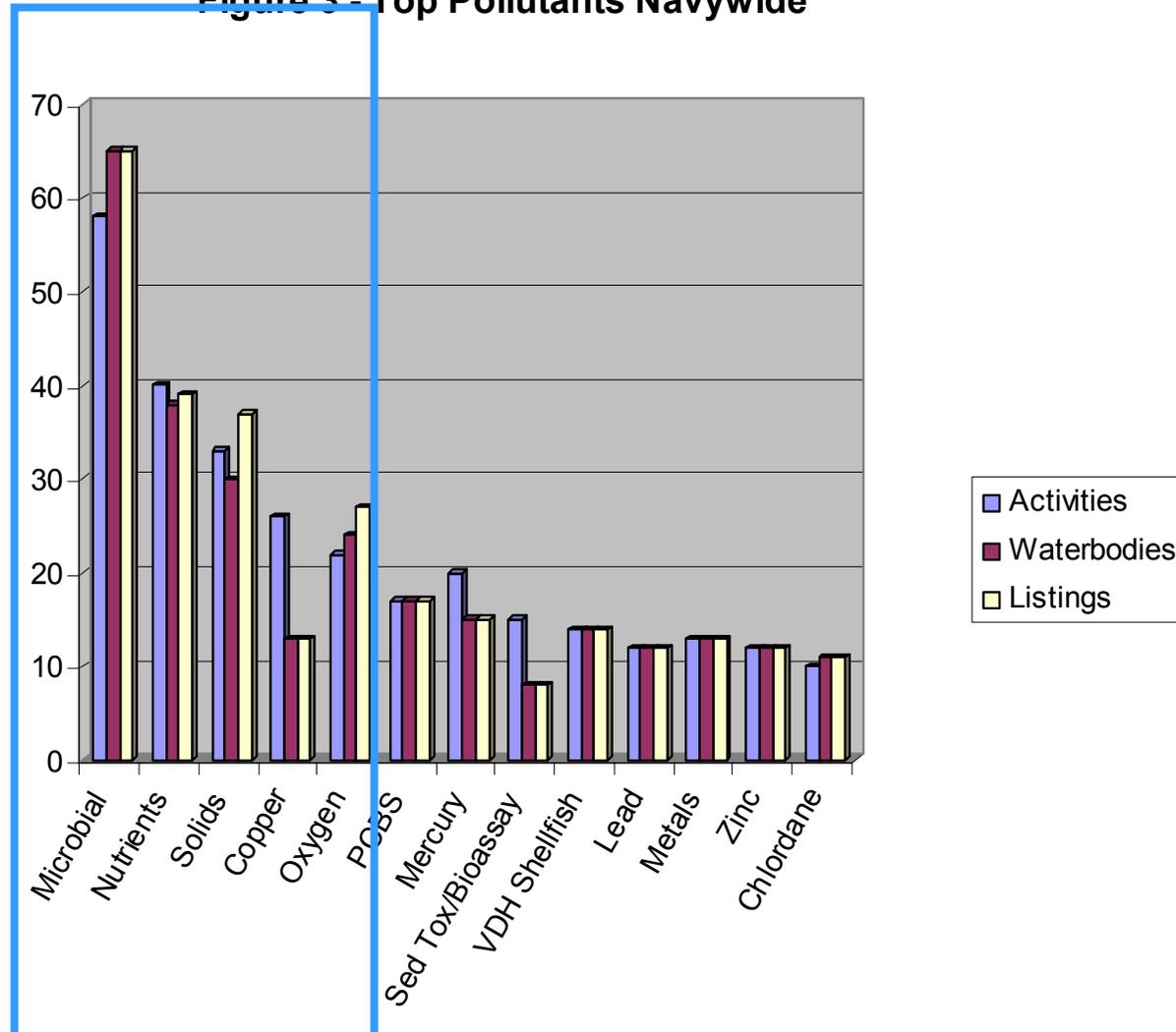
**Implementation
& Monitoring**

Technology Description

- **Technical guidance focused on high priority contaminants affecting Navy harbors, companion to NAVFAC reports.**
- **NAVFAC's Phase I TMDL assessment found that the "five most significant pollutants were:**
 - » **Microbial, Nutrients, Solids, Copper, Oxygen**
 - » **Emphasized in Draft Interim Guidance**
- **NAVFAC's Phase II TMDL Prioritization added several new constituents to the top concerns:**
 - » **PCBs, Benthic impacts, Shellfish, Mercury, F-Coliforms, As, Zn**
 - » **Emerging concerns incorporated into Final Technical Guidance**
- **SSC-SD is recommending scientific assessment approaches to guide Navy efforts for these pollutants**
 - » **These pollutants are responsible for >1/2 TMDL impacts**
 - » **Knowledge base is drawn from published federal/state guidance, scientific literature, and case studies.**
- **SSC-SD will demonstrate utility of Technical Guidance at Case Study sites, selected by End Users**

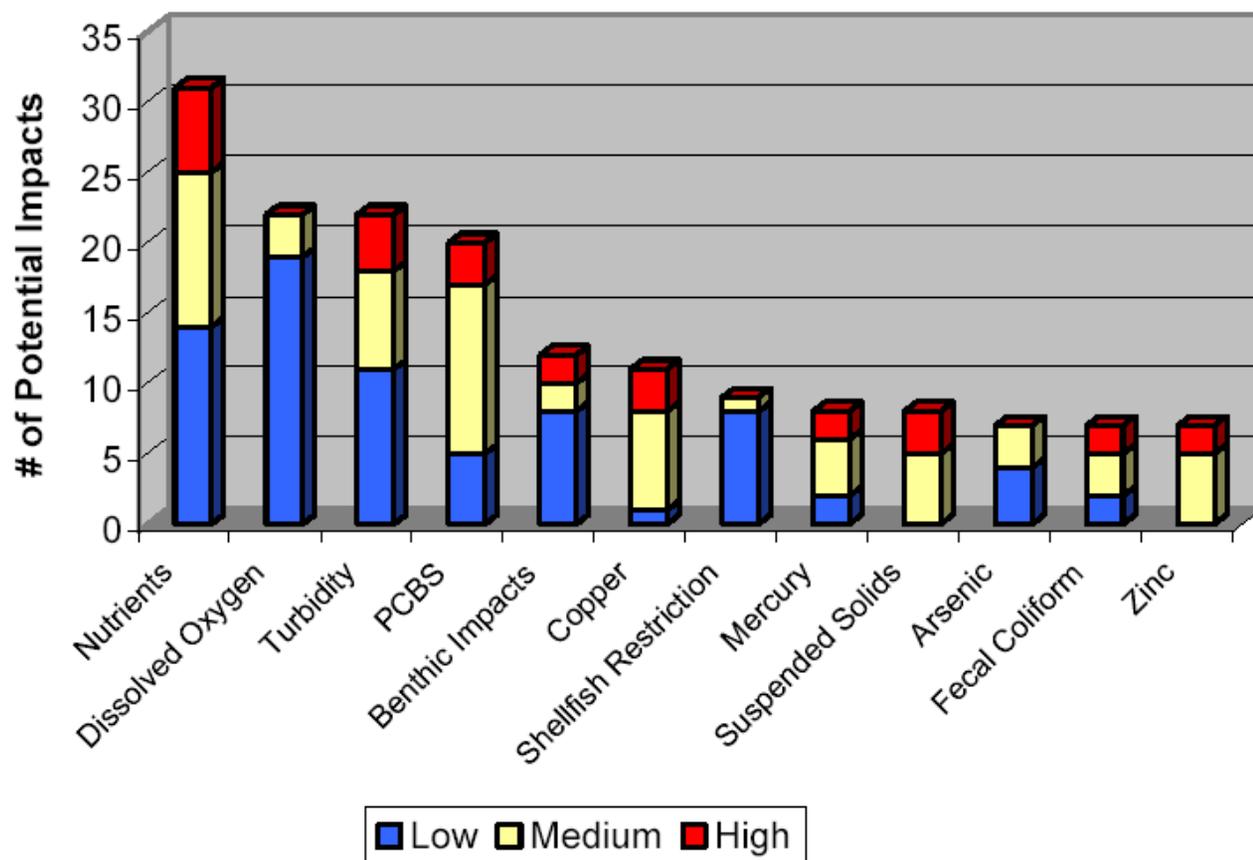
Findings from NAVFAC Phase I Report

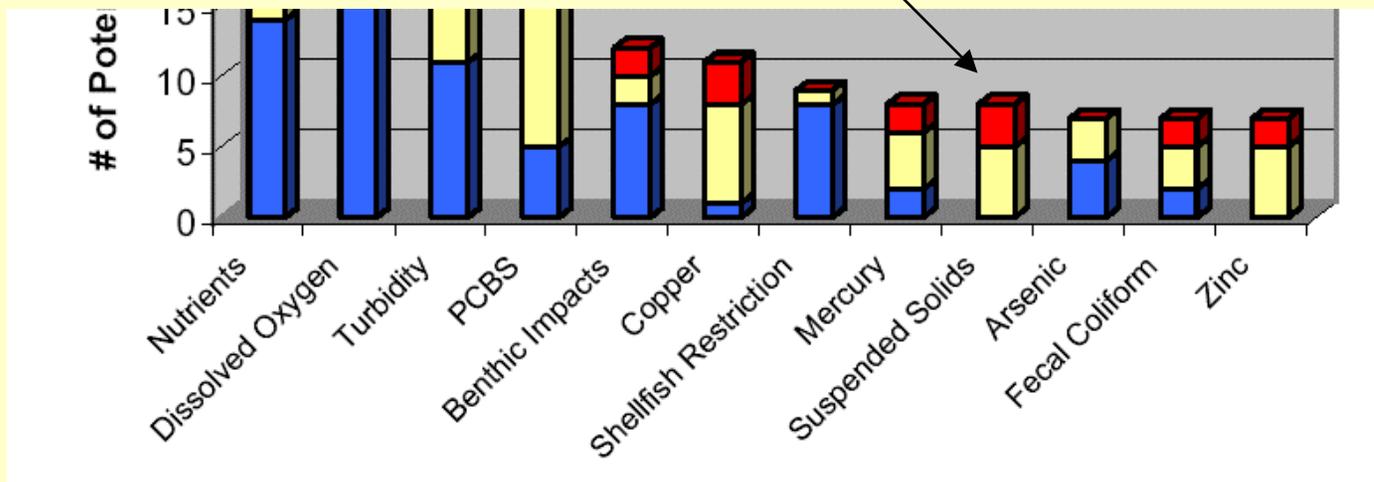
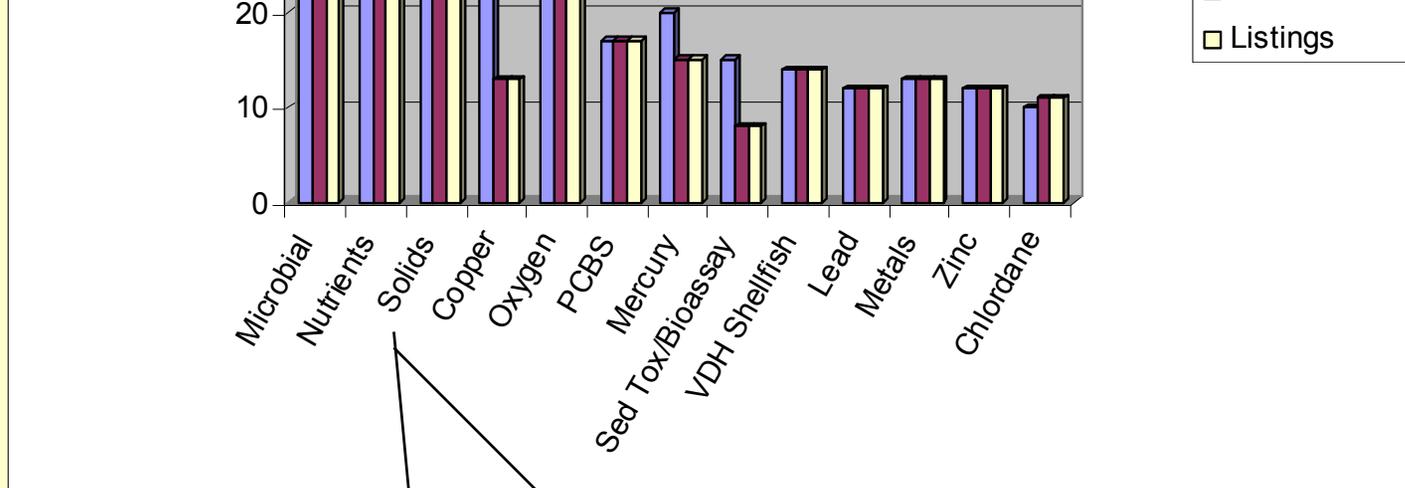
Figure 3 - Top Pollutants Navywide



Findings from NAVFAC Phase 2 Report

Figure 3. Top Impairments Based on # of Potential TMDL Impacts to Navy





Return on Investment

- Historically, regulatory agencies have supported TMDLs, which are overly conservative (most restricting to dischargers and permittees) in the absence of data because of...
 - » Margin of Safety (MOS) in the following TMDL equation:
$$\text{WLA (Wasteload Allocations)} + \text{LA (Load Allocations)} + \text{MOS} = \text{TMDL}$$
- ROI Goal: Reduce MOS with high quality data and save \$\$\$.

ROI (Cont'd)

- **Benefits from implementing this project will be technical tools to assist in TMDL planning and result in:**
 - » **cost savings/cost avoidance**
 - » **improved compliance (e.g. avoidance of NOVs etc.)**
- **In a recent EPA study, the following costs were estimated for the nation's 36,000 TMDLs in over 20,000 waterbodies;**
 - » **\$60-70 million/year to develop TMDLs (i.e. establish quantifiable goals)**
 - » **\$17 million/year for water quality monitoring to support development**
 - » **\$1-4 billion/year to implement TMDLs (i.e. control the pollutants)**
- **No Navywide estimates are available, but PSNSY spends \$1M per year on NPDES compliance.**

Milestones & Deliverables

- √ **FY03: Interim** Technical Guidance for Implementing TMDLs for Pathogens, Nutrients, Solids, Copper, and Oxygen
 - √ Milestone/Deliverable slipped 2 quarters, does not impact remaining deliverables.
 - √ In retrospect, 1.5 yr for first draft, 0.5 yr to refine would have been a better way to project milestones
- ☺ **FY04: Final** Technical Guidance for Implementing TMDLs for 5 Ph I constituents plus high-priority Ph II constituents, and transition to managers.
- **FY05: Implementation and Documentation of Relevant Case Study(ies).**

Gantt Chart

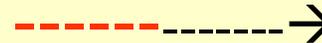
Fiscal Year By Quarter

Task	FY03				FY04				FY05			
	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4

Interim Guidance



Final Guidance



Case Study/Demo



Project Coordination

- **This Navywide TMDL Technical Strategy is being coordinated with key Navy working groups:**
 - » **CNO's TMDL Working Group**
 - » **NAVFAC/NFESC TMDL Assessment Team**
 - » **NAVFAC Media Field Team Water**
 - » **Navy Regional Water Offices**

Technical Accomplishments to Date

- **Completed Interim Guidance April 04, on sked for Final Guidance Sep 03.**
 - » 5 constituents from Phase I Assessment
 - Nutrients/Oxygen, Solids, Pathogens, Copper
 - » **Integrative Issues section:**
 - Common to all constituents/TMDLs
 - » **Adding new Chapter for Ph II Report concerns**
 - Persistent Organic Pollutants (PCBs, Hg)
 - Sink/Source issues among Matrices (S/W/T)
 - Others: Arsenic (As)
- **User input/feedback thru CNO TMDL WG**
 - » Incorporating comments/edits this Quarter (3rd)
 - » Final internal/external review 4th Quarter

Technical Accomplishments

Chapter 1, Integration

- **When is it necessary to assess/develop TMDLs?**
 - » Preempt, listing, TMDL develop/implement/monit, delist
- **Proper Uses & Water Quality Standards**
 - » WBs may have inappropriate Uses, inaccurate WQS
- **Programmatic issues:**
 - » legacy, background (don't clean up others' messes).
- **Cross-cutting technical issues:**
 - » target media/matrix, co-variance, synoptic monitoring,
- **Data Collection Sampling & Analysis**
 - » SAP design, Data Quality, Quality Assurance/Control
 - » Uncertainty, Margin of Safety
- **TMDL Calculation approaches**
 - » Scoping the complexity (start simple, use tiered strategy)
 - » modeling & adaptive management approaches

Technical Accomplishments

Chapter 2, Solids (Dr. Robert George)

- **Phase I grouping: Total Suspended Solids (TSS), Turbidity, Suspended Particulates, Siltation, Sedimentation, Optical Clarity (Transmissivity)**
 - » Visual observation/optical clarity useful for screening (secchi)
 - » Optical scattering for monitoring (e.g., turbidity, nephelometry)
 - » Gravimetric techniques best for quantification (e.g., TSS, TS)
- **Bedded sediments not explicitly related from TMDL listings, but associations exist and need to be investigated...**
 - » Many pollutants sorb to solids and end up in sediments
 - » Hydrophobic compounds (Persistent Organic Pollutants):
 - PCBs, PAHs, organo-Hg
 - » Effects on sediment bed: benthic community, sediment toxicity
- **Other potential associations: pathogens, nutrients, oxygen, metals**

Technical Accomplishments

Chapter 3, Pathogens (Dr Ken Richter)

- **Bacteria different than most COCs:**
 - » Rapid “die-off” degradation (light, temp, mixing depth)
- **Measure either Escherichia coli (fresh water) or Enterococcus sp (marine) rather than fecal coliform when estimating loads**
 - » unless shellfish consumption is the major concern
- **Episodic storm water outfalls and combined sewer outfalls (CSOs) are critical pulses of pathogens into the receiving water.**
 - » Sampling must include storm discharges into the receiving water.
- **Measure incident light and water clarity in the receiving water, since they are critical to bacterial survival.**
- **Emerging technologies in microbial source tracking may be useful in TMDL implementation**
 - » after the allowable load calculation has been made.
- **Be aware that incoming or resuspended sediment may be an important vehicle introducing bacteria into the receiving water column.**

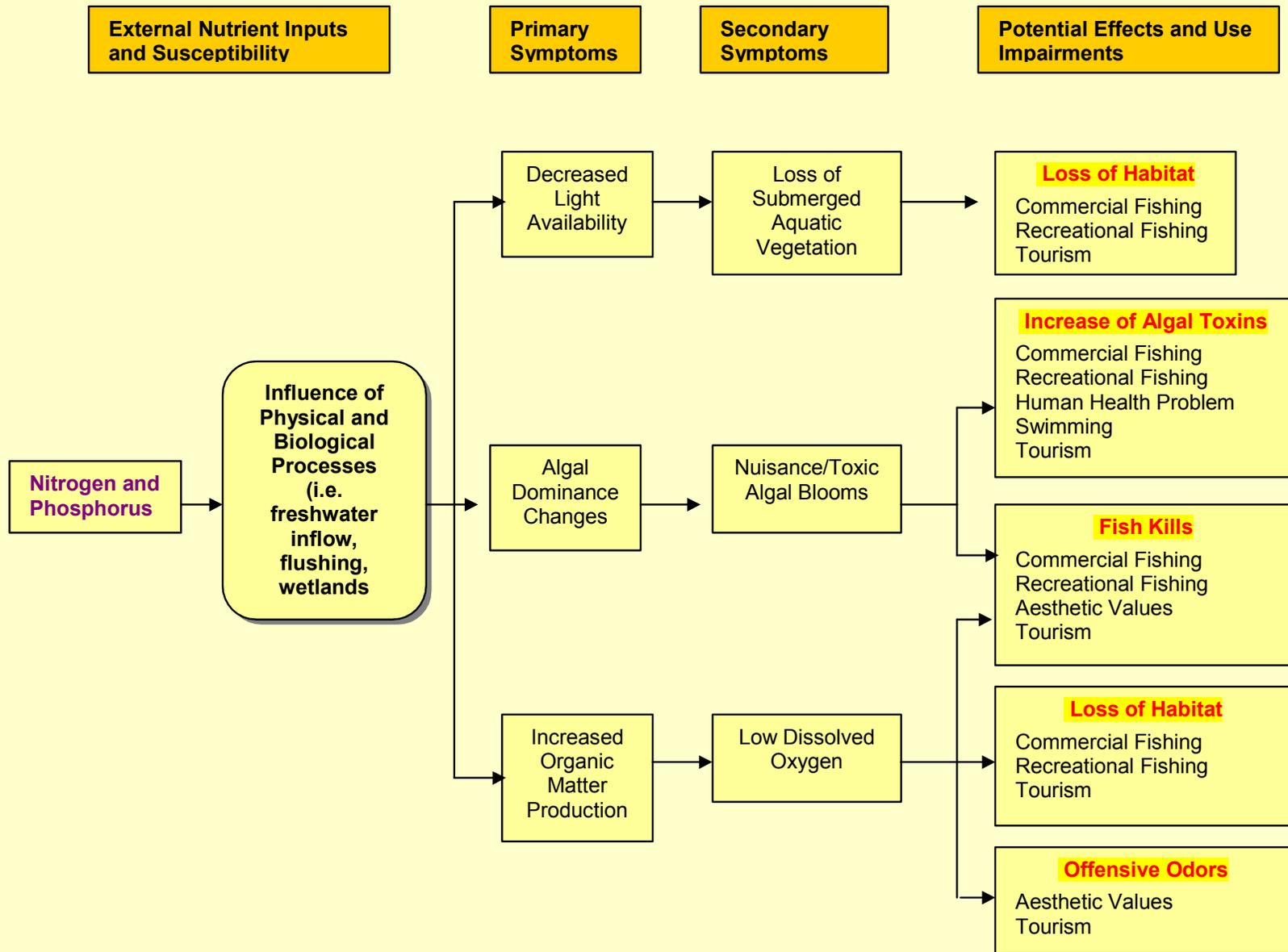
Technical Accomplishments

Chapter 4, Copper (Peter Seligman)

- **National WQC & State WQS for Copper becoming increasingly stringent (~3 ppb)**
 - » Near impossible for Navy to meet End-of-Pipe limits with respect to industrial processes, stormwater...
- **Scientific tools exist to reduce impacts to USN, all within regulatory framework:**
 - » **Site-specific water quality criteria**
 - Water Effects Ratios, Recalculation, Resident Species
 - » **Mixing zone analyses**
 - » **Other bioavailability adjustments**
 - biotic ligand, dissolved/total metal translator
 - » **Improved screening & trace metal analytics**

Chapter 5: Nutrients & Oxygen

Dr. Paulette Murphy, Christine In



Implementation Strategy: Accomplishments & Plan

- **Implementation through collaboration with Working Groups & proactive SSC transition campaign**
 - » Technical Guidance document will be published hard copy and electronically
 - » Existing infrastructure & funding for partners
 - » Case Study (Year 3) = demonstration
 - Technical Development of a TMDL
 - » SSC will use travel, internet, email, telecons to complete transition
- **Collaboration has proven to be successful, with substantive user input/feedback...**
 - » CNO TMDL WG reps: LANT, NE, SW, NW EFDs

Q3/4 FY04 Details: Refinement to Final Guidance

- **Consistent Grammatical editing**
 - » Terminology
 - » Tense
 - » Reference material
- **Consistent Reformatting**
 - » Tables of individual listings with navy activities to Appendices
 - » References
 - » Case studies
 - » Guidance and recommendations between sections
- **Revision/Updating of Content**
 - » Modeling material
 - » Tables/pictures
- **Addition of New section**
 - » Persistent Organic Pollutants (PCBs, Hg)
 - » Sink/Source issues among Matrices (S/W/T)
 - » Others: Arsenic (As)

Selection of Case Studies

- **CNO WG to select sites from candidate list drafted by SSC-SD, based on PhII Report**
 - » Match candidates w/ COCs & Hi-Pri lists
 - » Look for multiple COCs at single site
 - » Favor stringent states (WA, HI, CA, VA)
 - » **Bang for buck**
 - most listings
 - not currently receiving SSC-SD support in TMDLs
 - » **Cost, Urgency, & Public Relations factors**
 - More difficult to assess

Preliminary Draft Candidate List

- **Pearl Harbor HI (Nutrients & Solids)**
 - » Stringent state
 - » Nutrients: 3 facility listings (50% of total)
 - » Solids: 6 listings (67%)
 - same 3 as Nuts; x 2 CoCs: SuspSolids/Turbid.)
 - » Other CoCs: 2/3 listings for PCBs (67%)
- **NAS Pensacola FL (Copper & Oxygen)**
 - » Cu: only 1/3 not receiving SSC support (33%)
 - » Oxy: 1/2 listings (50%)
 - also examine cross-examine for Nutrient issues
 - » Other metals: Hi for Pb
 - » Moderately stringent state (?)
- **Other sites: SF Bay (cost/urgency PCBs),**

Logic Model

- **Navy Benefits** → ● **Cost-effective oversight, assessment & development of TMDLs through entire regulatory framework & processes**
- **Customer Capability** → ● **Greater understanding of complex technical soup of TMDL & Water Quality**
- **Products/Milestones** → ● **3-yr phased Guidance & Case Study Implementation/Demo**
 - » **Interim Draft Guidance (FY03)**
 - » **Final Tech Guidance (FY04)**
 - » **Case Study(ies?) (FY05)**

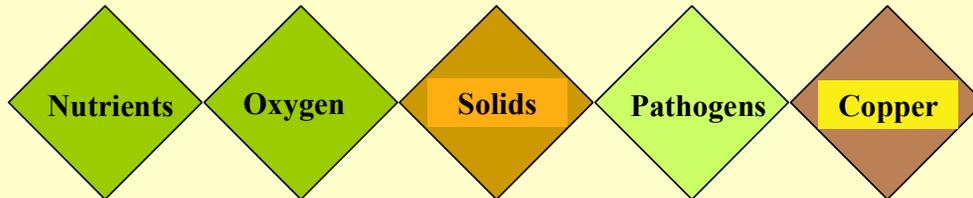
Navy TMDL Technical Guidance

•GOAL: To provide credible, science-based guidance for the assessment of the top drivers for Navy TMDL listings so that our managers can effectively collaborate with regulators and other stakeholders in the cost-effective development of appropriate TMDLs.

PRODUCTS

- **FY03:** Interim Technical Guidance for TMDL assessments for the 5 most common constituent groupings from NAVFAC Phase 1 Screening report.
- **FY04:** Final Technical Guidance for TMDL assessments for the 12 highest priority constituents from NAVFAC Ph 2 Prioritization report.
- **FY05:** Implementation, Documentation, and Transition of Relevant Case Study.

Which
Pollutants?



When Guidance to be used?



• Benefits of implementation:

- Reduce overly-conservative Margins of Safety (MOS) and Costs with well-designed studies and high quality data
- Improved compliance (e.g. avoidance of NOVs etc.)
- Better decision-making by Navy facilities