Sediment Quality Improvements Through Science Based Management Actions

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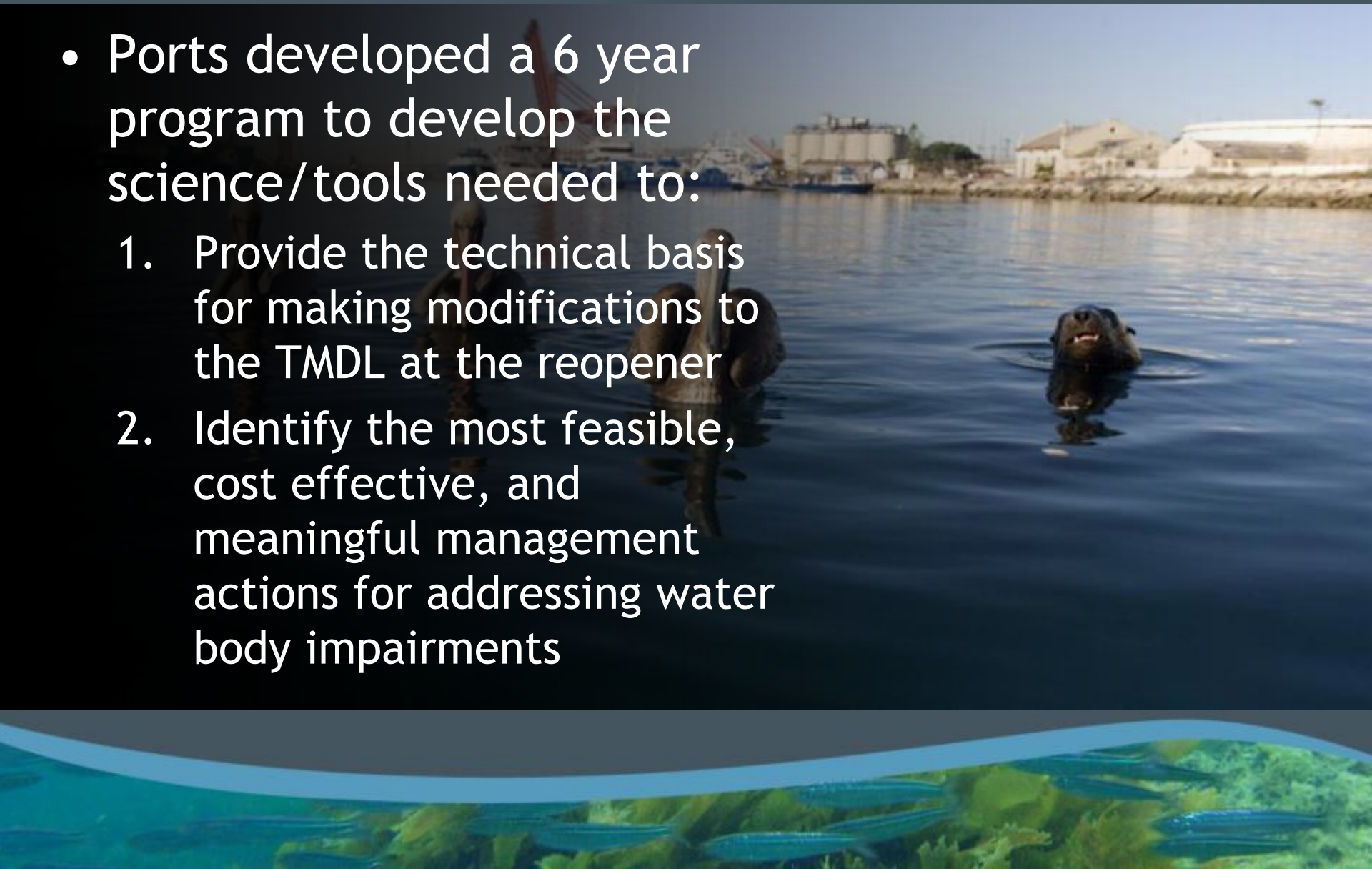
Strategy

- Ports developed a 6 year program to develop the science/tools needed to:
  1. Provide the technical basis for making modifications to the TMDL at the reopener
  2. Identify the most feasible, cost effective, and meaningful management actions for addressing water body impairments

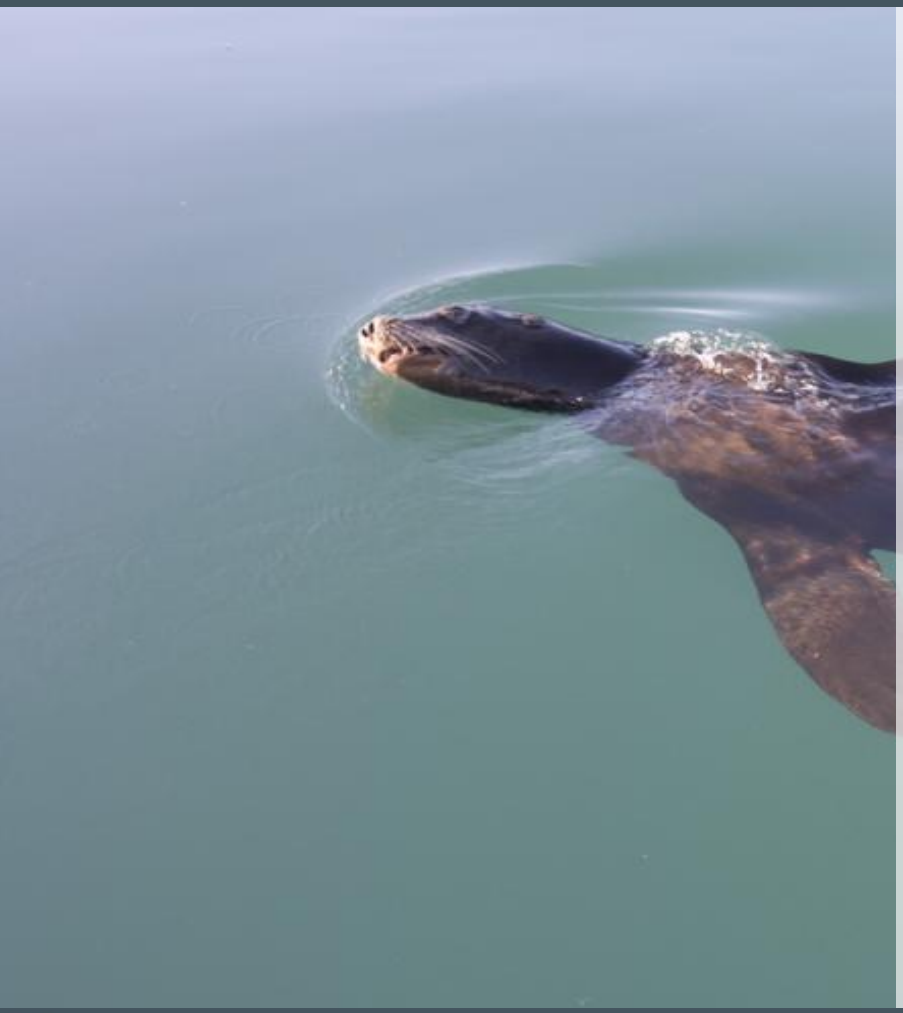


Program Elements

- Existing data collection and review
- Conduct a thorough data/knowledge gap analysis
- Develop a Conceptual Site Model (CSM)
- Fill data gaps through special studies/data collection
- Develop models necessary to identify linkages and evaluate potential management actions

Program Element Status:

Existing Data Review



- Gathered historical data from multiple sources

  Bio-Baseline, Bight, Port studies, TIWRP, BPTCP, LACSD, SCCWRP SQO Database, RWQCB, NOAA/USEPA, CFCP

- Screened to retain highest quality information
- This effort is complete
  - 439 harbor sediment samples
  - 580 harbor fish samples

Program Element Status:

Data/Knowledge Gap Analysis

- Identify and prioritize data needs for modeling efforts
  - Accommodate finite budget and schedule
- Used to design special studies
- This effort is complete

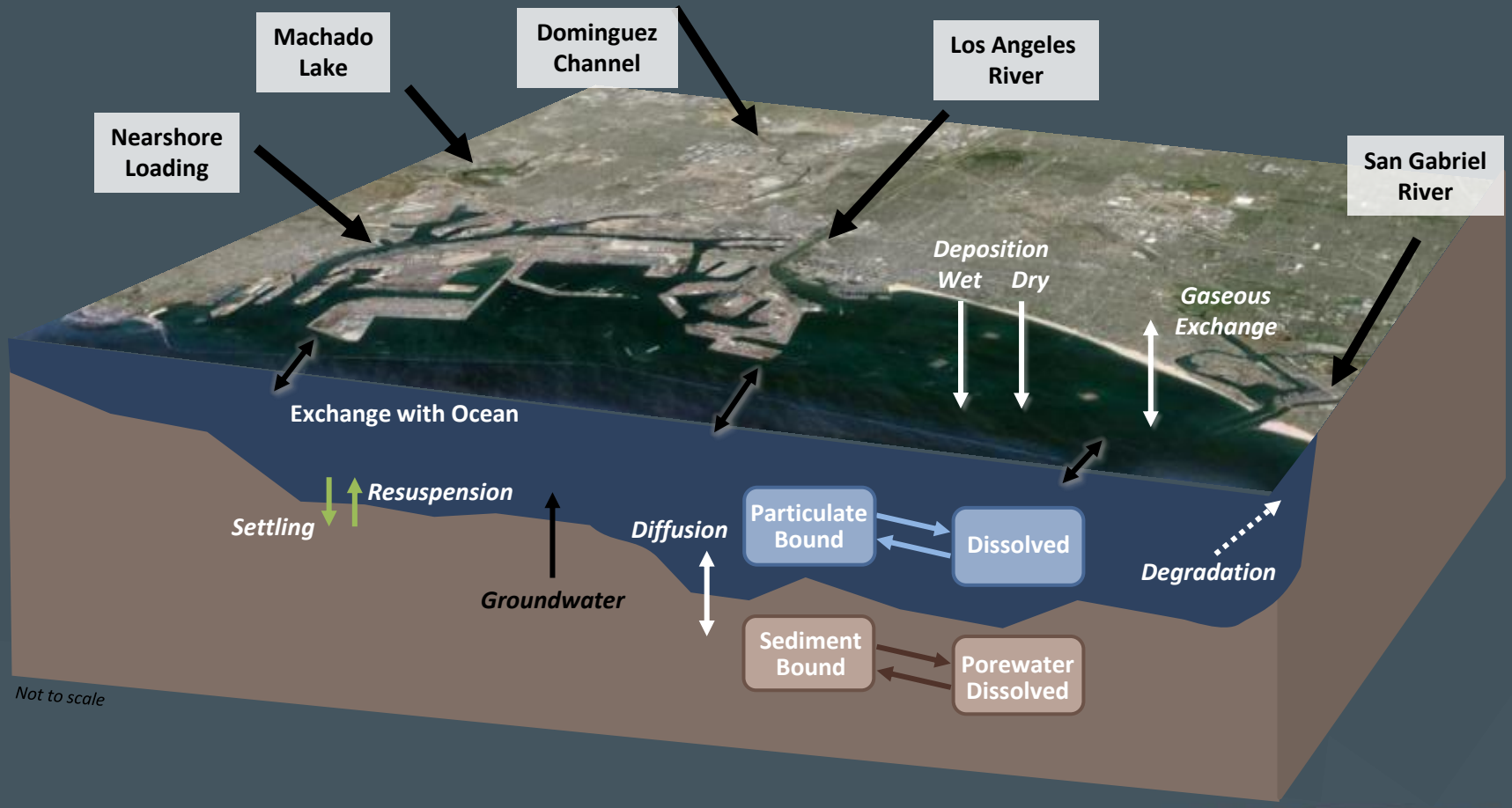
Program Element Status:

Develop a Conceptual Site Model

- A CSM is a conceptual framework for understanding and quantifying chemical sources and sinks to the water column/sediment
  - Guide data collection and modeling efforts by focusing on the more dominant processes
- CSM is informing integrated water quality model development

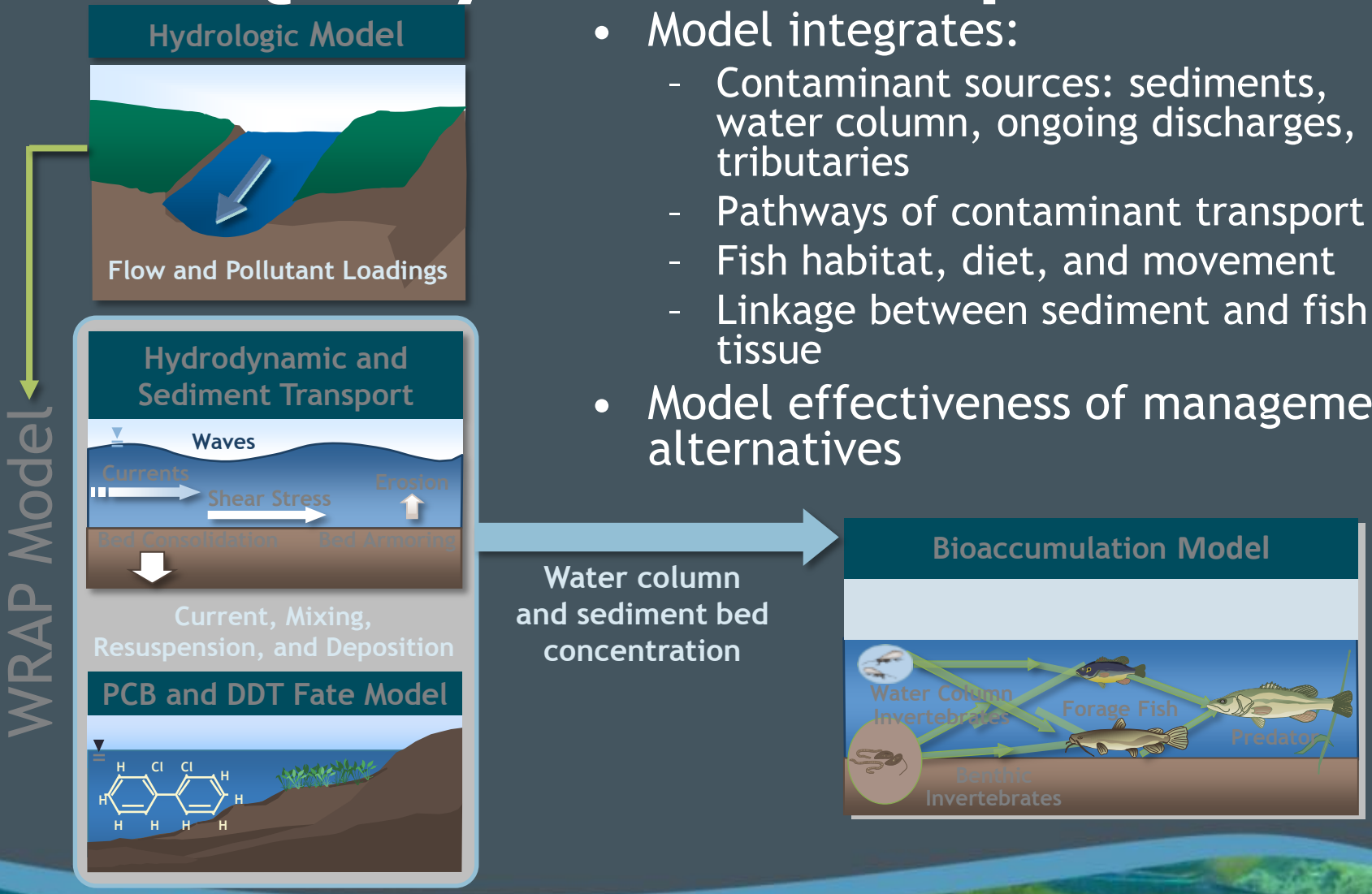
Program Element Status:

Conceptual Site Model for Chemical Fate



Program Element Status:

Water Quality Model Development



- Model integrates:
  - Contaminant sources: sediments, water column, ongoing discharges, and tributaries
  - Pathways of contaminant transport
  - Fish habitat, diet, and movement
  - Linkage between sediment and fish tissue
- Model effectiveness of management alternatives

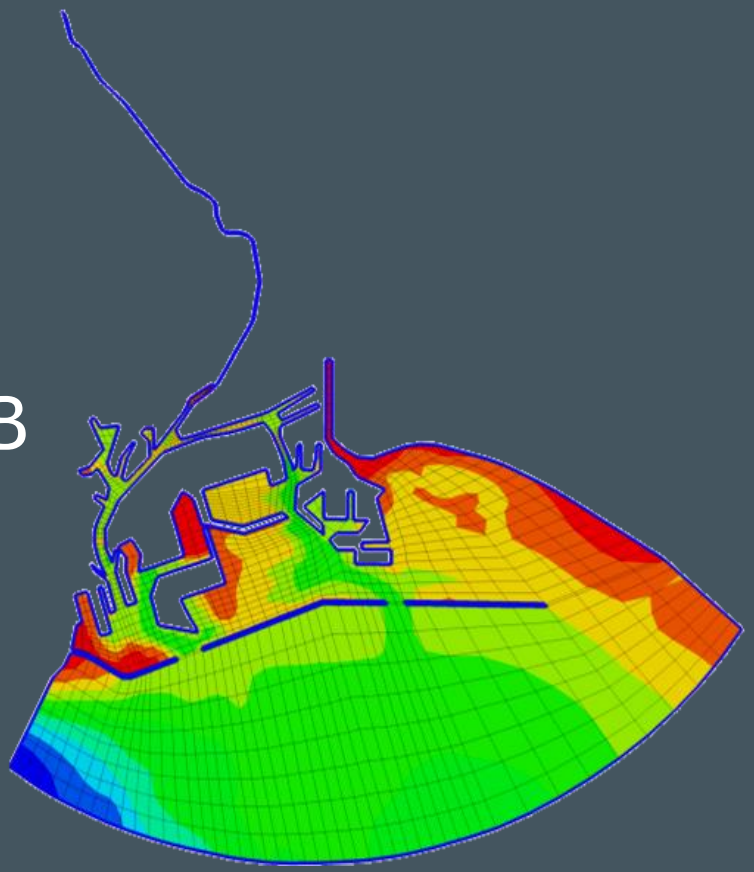
Program Element Status:
Special Studies

- Additional data is required to fill data gaps and develop, inform and calibrate the models
- Several special studies have been identified to acquire this data
- Scientific approaches are vetted by the HTWG
- Many studies are already underway

Special Studies:

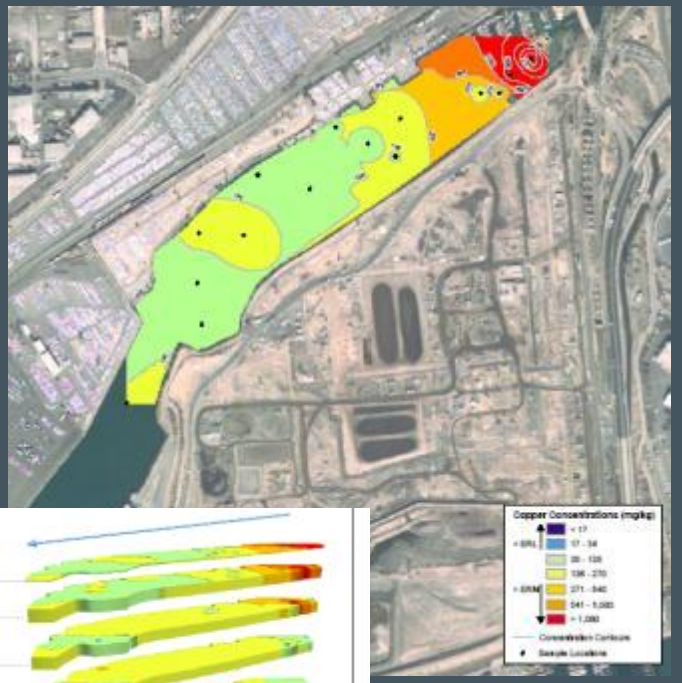
Hydrodynamic/Sediment Transport

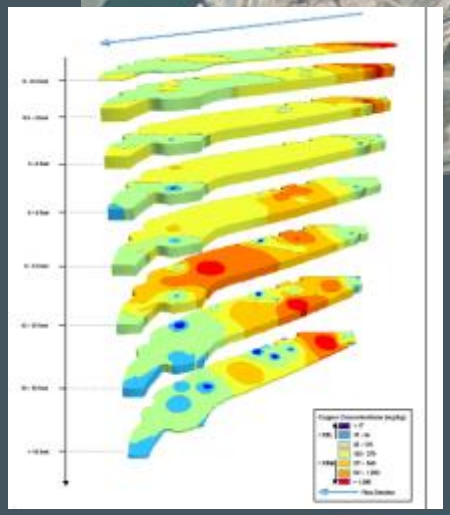
- Continually updating and refining WRAP model
- Evaluation of watershed loadings
- High resolution DDT and PCB watershed stormwater sampling
- Bedded sediment transport study
- Propwash analysis



Special Studies:
Temporal Trends

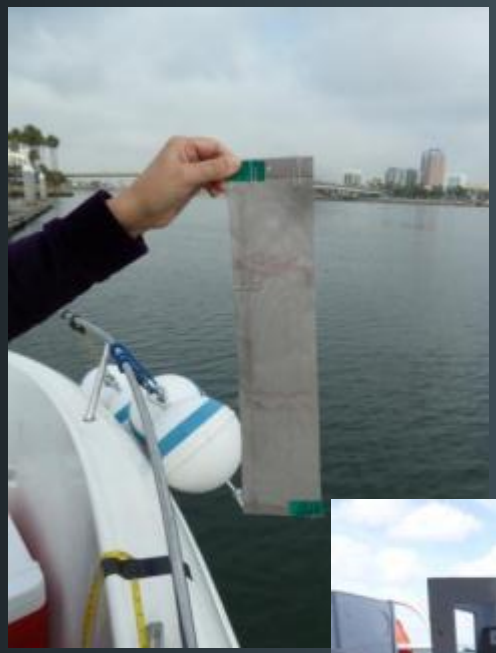
- Tissue concentration trends
  - Fish and mussel tissue
- Sediment recovery trend analysis
- Sediment geochronology analysis



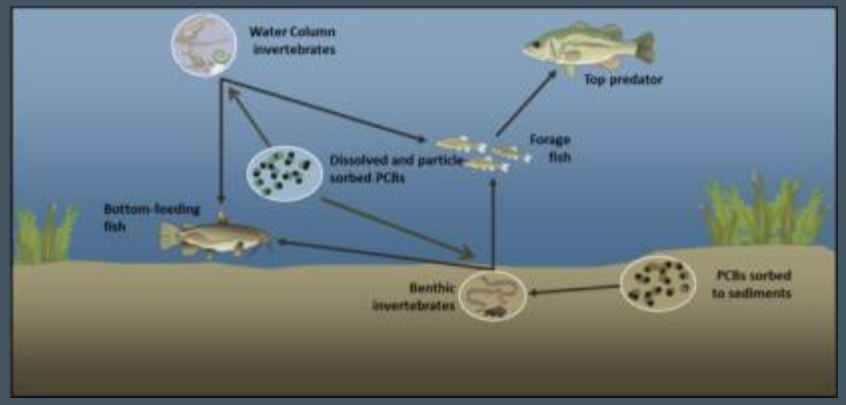


Special Studies:
Chemical Fate Modeling

- Ultra-low detection limit water column sampling for DDTs and PCBs



Special Studies:
Bioaccumulation



- Bioaccumulation Modeling
  - Fish tracking study
  - Food web transfer of contaminants
    - Collect samples of tissue from sport and prey fish, benthic infauna, and mussels
- Evaluation of Regional Background
  - Sediment concentrations
  - Fish Tissue

Key HTWG Decisions Related to Special Studies

- Use conceptual site model
- Use a linked model – hydrodynamic/sediment transport/chemical fate/ bioaccumulation
- Selected appropriate fish species for bioaccumulation model (white croaker, shiner surfperch, CA halibut)
- Undertaking temporal trend analysis
- PQAPP covering both required monitoring and special studies reviewed and approved

Key HTWG Decisions Related to Special Studies

- Use empirical methods to estimate watershed loading
  - Use of LSPC watershed models will be considered if funding becomes available
- Use of high-resolution geochronology core study to understand temporal trends and sediment deposition rates
- Special studies scopes/SAPs will be reviewed by HTWG

Key HTWG Decisions Related to Special Studies

- Special study scopes approved:
  - Ultra-low detection limit water column study
  - Ultra-low detection limit watershed study
  - Data gaps analysis approach
  - Geochronology study
  - Fish tracking (phase II)
  - Bedded sediment transport study

Preliminary Results of Selected Special Studies:

Fish Tracking Study

Preliminary Results of Selected Special Studies:

Fish Tracking Study Phase I

- Approximately 50% of PV fish detected in LA Outer Harbor
- Consolidated slip is an important area
  - High site fidelity
  - Fish travel there from other areas
- Fish commonly move between adjoining areas
  - Exception of the outer harbors
- The passive tracking data will be used to calibrate the bioaccumulation model

Preliminary Results of Selected Special Studies:

Ultra Low Detection Limit Watershed Loadings

Site	Total Detectable PCBs (ng/L)		Total Detectable DDTs (ng/L)	
	D1	W1	D1	W1
LAR	3.38	37.5	1.1	19.8
DC	1.15	20.3	0.4	25.6
FWL	--	11.9	--	52.9
ML	--	1.1	--	1.24

Still significant loadings of legacy pollutants originating from watershed

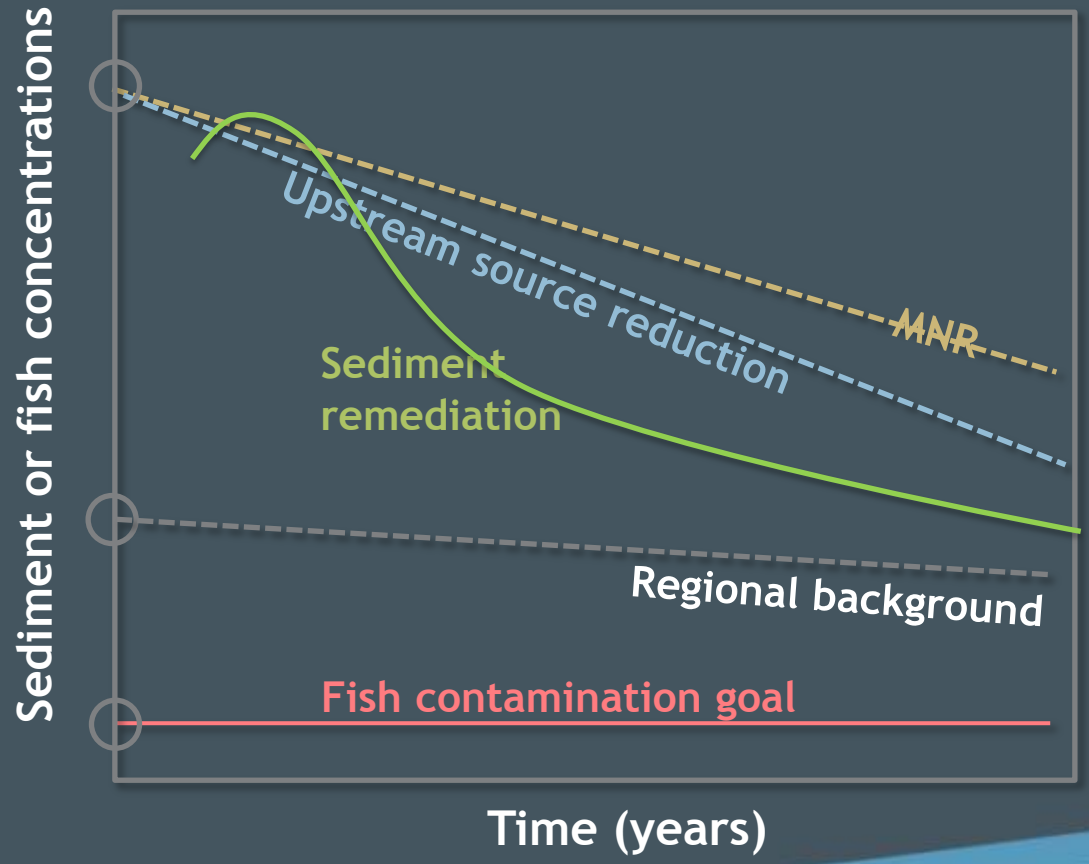
Preliminary Results of Selected Special Studies:

Low Detection Limit Water Column TPCBs and TDDTs

	TPCB Concentrations (ng/L)			TDDX concentrations (ng/L)		
Station	Grab (measured)	SPME (estimated)	HV (measured)	Grab (measured)	SPME (estimated)	HV (measured)
Consolidated Slip	1.96	2.75	1.43	0.623	0.780	0.595
Los Angeles River Estuary	1.71	2.03	0.665	0.649	0.670	0.205
Outer LB Harbor	0.499	0.702	0.356	0.555	0.686	0.626
E. San Pedro Bay	0.378	0.901	0.263	0.294	0.663	0.313
Reference Site	0.136	ND	0.101	0.418	ND	0.406

Model Outcomes Will Inform Management Decisions

Conceptual illustration of potential model run results



Next Steps

- Continued close collaboration with HTWG
- Additional special studies implementation
- Complete model linkages
- Continue to calibrate model with special study data
- Preliminary model runs/scenarios



DISCUSSION