

# Attachment 1: Regional Sediment Assessment Framework Outline

## FRAMEWORK OUTLINE

### Regional Sediment Assessment Framework for Central Coast Regional Water Quality Control Board

October 2004

#### Module 1 — Framework Guide

- 1) Concept and Purpose of Framework
  - a) Concept: a systematic approach to developing knowledge of water quality conditions affected by sediment, and putting that knowledge in the hands of Regional Board staff.
  - b) Provide tools to develop a clear definition of sediment problems
    - i) Provide a consistent approach to characterizing effects of sediment on beneficial uses
    - ii) A tool for TMDL staff, other staff: Ag-program, stormwater, Nonpoint Source
- 2) The cost of not having an effective assessment framework is:
  - a) Lacking sufficient information, staff makes erroneous conclusions about the causes and consequences of erosion and sedimentation observed in the field.
  - b) Measures of effects are inconsistent between areas resulting in uneven application of regulatory actions.
- 3) Limitations: emphasizes accurate definition of problem (is sedimentation accelerated and how is it affecting beneficial uses, where a beneficial use is known) with a secondary emphasis on determining the factors producing those conditions (flow alteration, urbanization effects, gravel mining, timber, etc.).
- 4) Framework Structure and Components
  - a) Continuous updating and feedback loops (e.g., new protocols developed as our understanding of conditions improves.)
- 5) How to Use Documents and Components
- 6) Schedule and Phases
- 7) Resource Commitments
- 8) Relationship to existing programs (Central Coast Ambient Monitoring Program, Total Maximum Daily Loads, Stormwater, Nonpoint Source, Point Source.)

#### Module 2 — Guide to Accurate Identification of Sedimentation Impacts in Region

##### *Part I: Background and Key Concepts*

- 1) Particle sizes (bed load, suspended load, dissolved load)

- 2) Hydrology
  - a) Flow duration
    - i) Major Patterns: Unregulated, Regulated, Partly Regulated, and Urban Streams
- 3) Stressors
  - a) Natural disturbance regimes
  - b) Anthropogenic: channel modification, flow alteration, vegetation modifications, sinks, etc.
- 4) Water Quality Standards for Sediment
- 5) Beneficial Uses affected
- 6) Criteria for evaluating Beneficial Uses affected
  - a) Lotic systems: rivers, streams, agricultural ditches
  - b) Estuaries, sloughs
  - c) Lakes, reservoirs, ponds
  - d) Harbors and bays
- 7) Indicators of effects on beneficial uses
  - a) Numeric Evaluation Guidelines for 303(d) listing

***Part II: Guide to interpreting Sediment Conditions***

- 1) Expected Conditions Analysis
  - a) Introduction to Landscape Stratification approach
  - b) Purpose and products of Expected Conditions Analysis
  - c) Required parameters for Expected Conditions Analysis
    - i) Function of data relied upon, including specific digital coverages (spatial data) and tabular data.
    - ii) Analytical procedures: describe how data are to be manipulated, treated, interpreted.
    - iii) Metadata storage protocol
  - d) Results (Products) key map products, tabular data, and summary analytical reports.
- 2) Guide to landscape features and landuse affects on erosion and sedimentation
  - a) Dams, gravel mining areas, channel maintenance areas, bridges, highway grades, etc.
  - b) Land management (timber harvest, military or open space reserves, etc.), (product of GIS analysis; could be a screening exercise expressed as risk, source, vulnerability, hazard etc.).
- 3) Method for estimating “background” sediment for different contexts:
  - a) Spatial (i.e., upstream and downstream of a given location),
  - b) Temporal (i.e., before contemporary disturbance (construction site), or before historical disturbance (e.g., before grazing in Salinas Valley, or Morro Bay watersheds).

**Module 3 — Sediment Problems in Region 3**

- 4) The historic context of erosion and sedimentation in Region 3 (disturbance history)
  - a) Santa Cruz Mountains
  - b) Watsonville Sloughs and Pajaro River Watershed

- c) Salinas River Watershed
- d) Morro Bay Watershed
- e) South Coast and Interior Valleys
- 5) Status of Known problem areas and sites
  - a) Sediment loads calculated for San Lorenzo River, Los Osos Creek, etc.
  - b) Fish habitat impacted by sedimentation
  - c) Dredged waterways
  - d) Turbidity effects on municipal water supplies

## **Module 4 — Sediment Data Collection and Monitoring Protocols**

- 1) Ambient Monitoring for Lotic Systems
  - a) In-stream
    - i) Measurements of Active Bed Matrix
      - (1) Particle Size Distribution
      - (2) Embeddedness
      - (3) Other
    - ii) Measurements of Fine Sediments in Pools
      - (1) Rapid assessment methods
      - (2)  $V^*$
      - (3) Other
    - iii) Thalweg profile
    - iv) Pool/riffle distribution
    - v) Dominant bedform
      - (1) Confinement
      - (2) Entrenchment
    - vi) Aquatic Insect Production
    - vii) Turbidity
    - viii) Suspended Sediment Concentration
    - ix) Other Protocols Considered
  - b) Watershed/Hillslope/Upland
    - i) Hydrologic Connectivity of Roads
    - ii) Stream Diversion Potential at Road Crossings
    - iii) Other protocols considered
- 2) Ambient Monitoring for Estuaries, Sloughs, and Lentic Systems
  - a) Water clarity
  - b) Sediment Accumulation
  - c) Aquatic Insect Production
  - d) Other protocols considered
- 3) Site Investigation, Inspections, and Surveillance Methods
  - a) Visual channel inspections to document sediment accumulation
  - b) Sediment Transport Corridors
  - c) Photo-monitoring
  - d) Other protocols considered
- 4) Quality Assurance and Control

## **Module 5 — Data Storage and Information Management**

- 1) Literature Library
- 2) Sediment Assessment and Numeric Data System
  - a) Electronic data files
  - b) Spatial data files

## **Module 6 — Staff Training Plan**

- 1) Develop training materials
- 2) Deliver training to staff

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