SB 1070 Comprehensive Monitoring Program: Annotated Outline (05/22/09)

Chapter 1: Introduction

- Audience for this report is Secretaries of Resources Agency and CalEPA and other interested parties in Legislature,
- Requirement for this report in the Act
- Purpose of report – to lay out a ten-year plan to achieve ambitious goals related to design and implementation of water quality monitoring programs, use of monitoring data in assessments and decision making, and development of tools and supporting infrastructure to enable wide access to data and information products
- Comprehensive Strategy addresses each aspect of the Act, as illustrated in Appendix 1
- Solution Council proposed in December 2008 report has proved to be good / bad / indifferent and has provided the basis for significant progress to date and for development of the comprehensive ten-year strategy

Chapter 2: Review of 2008 Recommendations

- Fundamental vision of broader data access through theme-based web portals.
- Five-part solution:
  - An organizational structure built on decentralized, issue-specific workgroups that operate within common policies and guidelines defined by the Monitoring Council
  - A set of performance measures which each theme-based workgroup will use to evaluate, coordinate and enhance monitoring, assessment, and reporting efforts
  - A single, global point of entry to water quality data, and a design template for the complete set of theme-based web portals
  - Standardization of monitoring and assessment methods that achieves an appropriate balance between statewide consistency and regional flexibility
  - Database and data management standards necessary for more efficient data access and integration

Chapter 3: Progress to Date

Review progress for each of the five parts of the recommended solution. Provides the basis for an assessment of whether the five-part solution is going to be an effective way of moving forward.

- **Organizational structure:**
  - Council governance
    - Established procedure for empanelling new Council members as needed
    - Broadened Council's working relationships with other state agencies
    - Defined scope of Council's responsibility
    - Began establishing standards and procedures for developing portals
  - Have set up four workgroups operating under overall guidance of the Monitoring Council
    - Summarize progress of each workgroup (may use table format instead of text)
      - Safe to Swim portal up and running; collaborative relationship among State Water Board, U.S. EPA, monitoring agencies working smoothly; Beach Water Quality Workgroup has formally agreed to manage development, in conjunction with State Board and SCCWRP,

through a technical subcommittee; additional data sources (e.g., stormwater and watershed programs) identified and contacted; decision about delegating portal operation and maintenance to SCCWRP
        - Safe to Eat portal up and running; collaborative relationship among State Water Board / SWAMP, OEHHA, SFEI working smoothly; BOG workgroup has formally agreed to manage development; additional data sources (e.g., stormwater and watershed programs) identified and contacted
        - Safe to Drink portal up and running; collaborative relationship between Office of Information Management and Analysis and GAMA / GeoTracker groups within State Water Board and with DPH working smoothly; workgroup established (??) to enable user participation in portal development
        - Wetlands portal (under heading of aquatic resources) up and running; collaborative relationship among State Water Board / SWAMP, California Wetlands Monitoring Workgroup, SFEI, and SCCWRP working smoothly; additional federal, state, municipal, and local programs involved; portal development and near-term maintenance led by SFEI
    - Provide links to portals
  - Council has begun outreach to other potential partners
    - Letter and follow-up contacts to broad range of managers in stage agencies listed in Act
      - List of contacts
      - Summarize responses
      - Summarize any agreements arising from outreach process
      - Map contacts onto list of portal priorities, revised from December 2008 report
    - Summarize unsolicited contacts to Council from other potential portal sponsors
  - Council has developed draft policies and guidelines for establishing and managing workgroups
    - Workgroups must include technical experts as well as users
    - Workgroups must have ability to make or influence decisions about design and implementation of monitoring, assessment, data management and access
    - Workgroups must agree to Council's basic portal design principles and goals for standardization, integration, access
    - Council will be flexible, within these constraints, in terms of the sorts of entities it works with (e.g., agencies, nonprofits, volunteer organizations, academics)
    - Illustrate with examples from each workgroup
  - Identify needed additions for future
- **Performance measures:**
  - Describe how the set of six performance measures correspond to the ten monitoring program design elements used by U.S. EPA and SWAMP. The ten elements provide the focus for monitoring efforts designed and implemented by the State and Regional Water Boards, while the Council's performance measures will guide a broader set of efforts within CalEPA, Resources, DPH, etc.

Monitoring Council performance measures	U.S. EPA / SWAMP design element
• Program strategy, objectives, design	• Monitoring strategy • Objectives • Design
• Indicators and methods	• Indicators • QA/QC
• Database	• Database
• Consistency of assessment endpoints	• Assessment
• Reporting	• Reporting
• Program sustainability	• Program evaluation

  - Describe progress in developing systematic approach(es) to dealing with the six categories of performance measures (condensed from the 10 USEPA elements of monitoring program design)
  - Describe how performance measures will be addressed by each workgroup and the overall strategy for ensuring coordination across themes
  - Specifically address Act's requirements re indicators, QA/QC, analysis and integration, data management, and reporting
- **Single point of entry:**
  - Council has established its website as the central access point to a set of portals focused on specific themes
  - Council has developed design criteria for its website and for main portal pages
    - Striving for consistent look and feel
    - Must be question driven, following general structure of questions defined for first four portals
    - Must include map-based query interfaces and data presentations
    - Must follow basic structure of presenting higher-level assessment results first, with more detailed background information on lower levels
    - Display multiple assessment thresholds if appropriate
    - Portals can go "live" before all data gaps, inconsistencies, and other shortcomings are resolved
    - In general, must follow other criteria used to evaluate portals in the December 2008 report
  - Describe degree of success at implementing consistent format guidelines, with a focus on more consistency at higher-level pages, and more flexibility at lower-level pages, which may link directly to other state, federal, etc. websites
  - Describe how organizing diverse information resources into one website is helping identify opportunities for improved standardization, coordination, integration, streamlining, filling data gaps
  - Describe how Council website promotes and depends on progress in database and data management (see below)
- **Standardization:**
  - Describe progress at standardization within each of the issue area workgroups
    - Adherence to existing standards or guidance
    - Development of new standards
    - Needed balance between statewide standards and local/regional flexibility
    - Additional level of standardization needed for cross-cutting issues and uses of data
- **Database and data management:**
  - Statewide infrastructure
    - CEDEN progress and capabilities
    - Data centers
    - SWAMP role and progress
    - Broad data format and QA/QC standards
    - Links to other state systems
    - Development of common tools applicable to multiple portals
    - Relationships with other efforts, e.g., UC Berkeley
  - Portals
    - Describe progress in establishing data management standards for each issue area
    - Describe how recommended hierarchy of standards (e.g., international, federal, state, issue area) has been applied
    - Degree of integration into Council's website

Chapter 4: Needs, Opportunities, and Challenges

Intended as a relatively brief summary of issues to create the rationale for the Comprehensive Strategy in Chapter 5. Will identify any changes or additions to the five-part solution based on this year's experience as summarized in Chapter 3.

- Lessons learned from effort on initial four portals
  - Need for flexibility given different starting points, participants, level of existing coordination
  - Standardization will not follow the same pathway for each theme
  - Need for an information technology workgroup to address cross-cutting issues
  - Each portal effort raised specific issues related to the Council's efforts as a whole
    - Safe to Swim
      - Streamlining data path raises question of degree to which data management should be centralized
      - Streamlining data path also raises question of whether to delegate core data management and portal maintenance to non-State Board entity (SCCWRP)
      - Highlighted importance of technical support for distributed network of data sources; better to do as much data management at the source as possible
      - Dependant to some extent on relationship with U.S. EPA Region IX for support
      - Highlighted issue of standardization of mapping interface software, with implications for how to allocate development to inside vs. outside State Board staff
      - Leveraged existing workgroup but highlighted opportunity to include additional parties (e.g., Heal the Bay) and data sources (e.g., stormwater and watershed programs)
    - Safe to Eat
      - Highlighted importance of strong relationship with the primary assessment entity (OEHHA) to ensure results presented accurately
      - Highlighted differences in assessment goals and data needs between important users (SWAMP and OEHHA)
      - Leveraged existing workgroup
      - Built on a mostly centralized monitoring effort, in contrast to Safe to Swim
      - Major portion of portal design by independent entity
    - Safe to Drink
      - Existing portals (e.g., GAMA / GeoTracker) may require more effort to adapt to the Council's format
      - Existing portal development efforts may have different approaches to structuring workgroups
      - Existing portals may present challenges to extracting specific data or assessment results to answer questions in Council's format
      - Importance of collaborative relationships with parallel efforts
    - Wetlands
      - Example of unsolicited relationship with the Council
      - Application of federal monitoring and assessment design approach
      - Example of need to accommodate local/regional flexibility within overall framework of standardized statewide program
      - More complex set of nested workgroups at state and local levels
      - Major portion of portal design by independent entity
- There has been lots of progress, but much remains to be done
  - An expanded effort on each of the five elements of the overall solution
  - Further definition and application of the six sets of performance measures
  - Outreach to parties involved in additional themes and subthemes
  - Institutionalization of procedures and relationships

  - Putting the effort on a more robust financial and institutional footing
- Need for consistent, long-term effort to sustain progress
  - Won't happen entirely on its own, although momentum and buy-in are increasing
    - E.g., increasing interest across state in regional monitoring programs that attempt to accomplish, on a smaller scale, some of what Council intends at the statewide scale
    - Increased interest within management agencies in larger-scale standardization and coordination within individual themes
  - Requires attention to governance and funding
- Council must expand its relationships with other entities that use monitoring data and information
  - Will leverage Council's resources and influence
  - Will streamline process of establishing new workgroups and implementing their recommendations
  - Will provide greater insight into users' needs
- Important opportunities exist that the Council can take advantage of
- Important challenges must be met for the Council's efforts to be successful

Chapter 5: Comprehensive Strategy

Applies information in Chapters 2 – 4 to development of the 10-year strategy.

- Basic strategy
  - Will apply to the longer term what has been learned this year by working through the four initial applications
  - Council will adopt an approach that combines careful planning and prioritizing with the flexibility required to take advantage of opportunities as they present themselves
  - Comprehensive strategy includes steps related both to the overall management of the effort as well as the development of theme-by-theme monitoring programs and web portals (Figure 1)
  - Describe steps in Figure 1
    - Describe role of SWAMP
    - Demonstrate how meets the requirements of the Act (Appendix 1)
    - Council establishes guiding principles for monitoring / assessment programs and portals
  - Council's role
- Define a structure that relates each theme-based monitoring and assessment effort to other themes and to the larger management environment
  - See Figure 2
  - Definition of these data and information flows also provides important direction to the development of data standards and the overall data management infrastructure
  - Includes major reporting responsibilities at state and federal level
- Schedule and budget
  - Prioritization of themes
    - Appendix 5 and other information in December 1, 2008 report provide starting point for prioritization
    - Will continue to prioritize based on level of concern, level of effort, and opportunity
    - Updated prioritization based on more information
    - Include priorities in outreach strategy (Table 1)
    - Include improved cost estimates based on 2009 effort (see below)
  - Budget
    - Cost estimates for four initial 2009 efforts
      - Estimates, including dollar and in-kind contributions
      - Analysis, including surprises and uncertainties

        - Costing framework for additional themes
            - Based on four 2009 portals, other agencies' efforts
            - Include institutional complexity, since that will increase amount of time/effort required
            - Includes filling data gaps, data QA/QC and management, portal development
            - Categorize themes into ranges of effort: small, medium, large, very large
        - Table of cost estimates for each theme
        - Estimate effort needed for the right side of Figure 1, technical and management infrastructure
            - Portion of existing efforts
            - New effort
    - Year by year deliverables and costs
        - Infrastructure
        - Relationships with other agencies and entities
        - Portals
        - Reports

Chapter 6: Recommendations

To be developed.

Table 1. Agencies responsible for gathering, assessing, and/or acting on monitoring data related to each of the themes, matched against the relative priority for each theme.

Theme-based portals	Priority	DWR	DF&G	Coastal Commission	State Lands	Parks & Rec	Forestry & Fire Prot.	DPH	OEHHA	DTSC	Waste Manag.	Water Board	NOAA
Is our water safe to drink?													
Surface water	1.7							X					
Groundwater	1.3							X					
Water at the tap	2.0							X					
Is it safe to eat fish and shellfish from our waters?													
Sportfish	1.7								X			X	
Shellfish	1.7							X	X			X	
Is it safe to swim in our waters?													
Freshwater	3.0							X				X	
Beaches, bays, and estuaries	1.3							X				X	
Are our aquatic ecosystems healthy?													
Wadeable streams	1.7		X										
Rivers	3.0		X										
Lakes	3.3		X										
Coastal waters													
Shallow marine reefs	2.0		X										
Intertidal	2.0												
Subtidal benthos	2.0												X
Enclosed bays and estuaries	2.3												X
Wetlands	2.0		X										X
Fisheries													
Anadromous fish	2.0		X										X
Freshwater fish	3.3		X										
Marine fish	3.0		X										X
Invasive species	2.7		X										
Harmful algal blooms	1.7												X

Theme-based portals	Priority	DWR	DF&G	Coastal Commission	State Lands	Parks & Rec	Forestry & Fire Prot.	DPH	OEHHA	DTSC	Waste Manag.	Water Board	NOAA
What stressors and processes affect our water quality?													
Loadings	3.7												
Flows	2.7												
Levels of contamination													
Water													
Freshwater	3.7												
Marine	3.0												
Sediment													
Freshwater	3.7												
Marine	2.7												
Aquatic life													
Freshwater	3.7												
Marine	2.7												
Landscape maps	2.7												
Measures of climate change	2.0												
Ocean acidification	3.0												

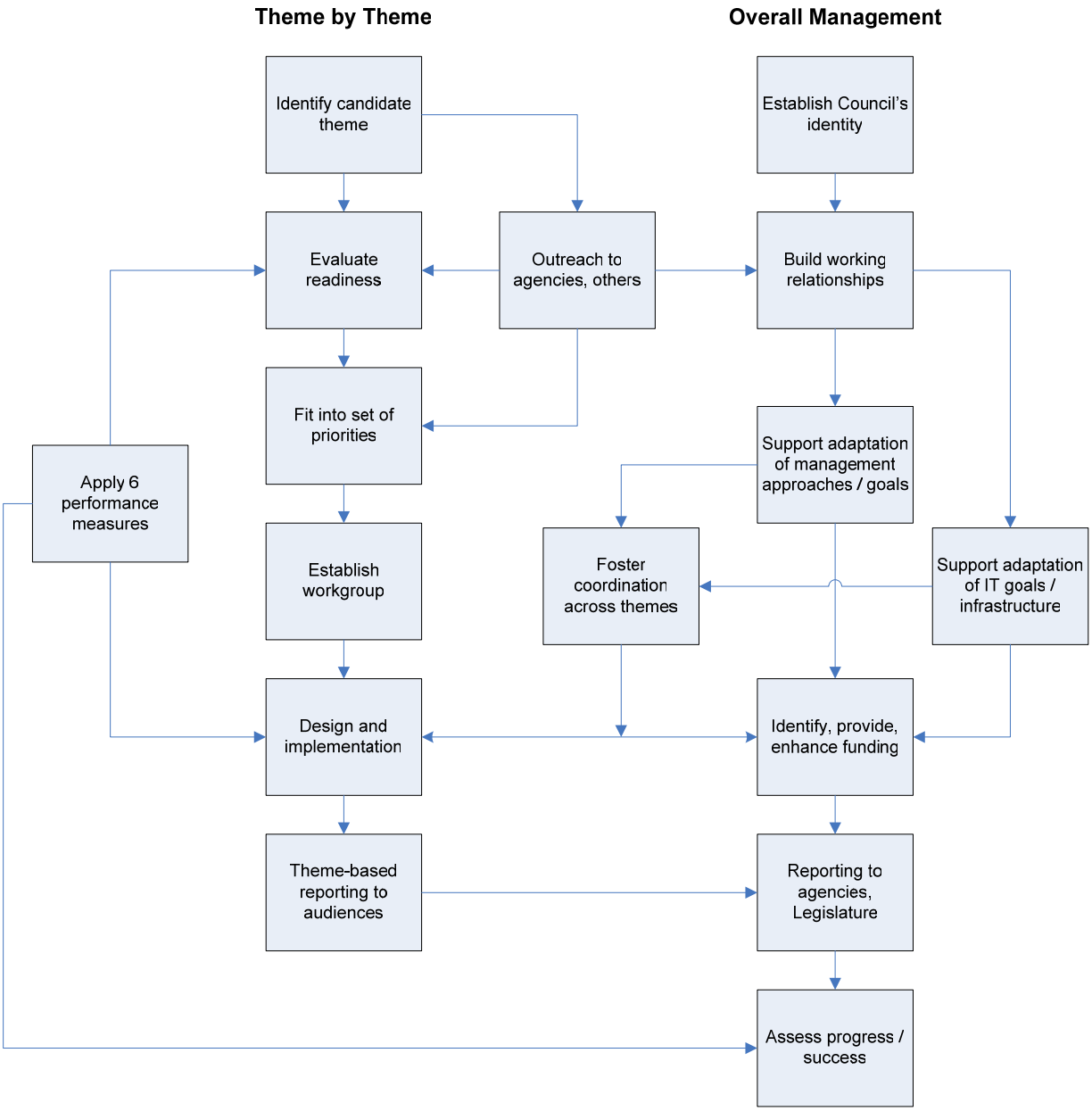

Figure 1. Parallel tracks needed to implement theme-based monitoring and assessment within the context of web portals.

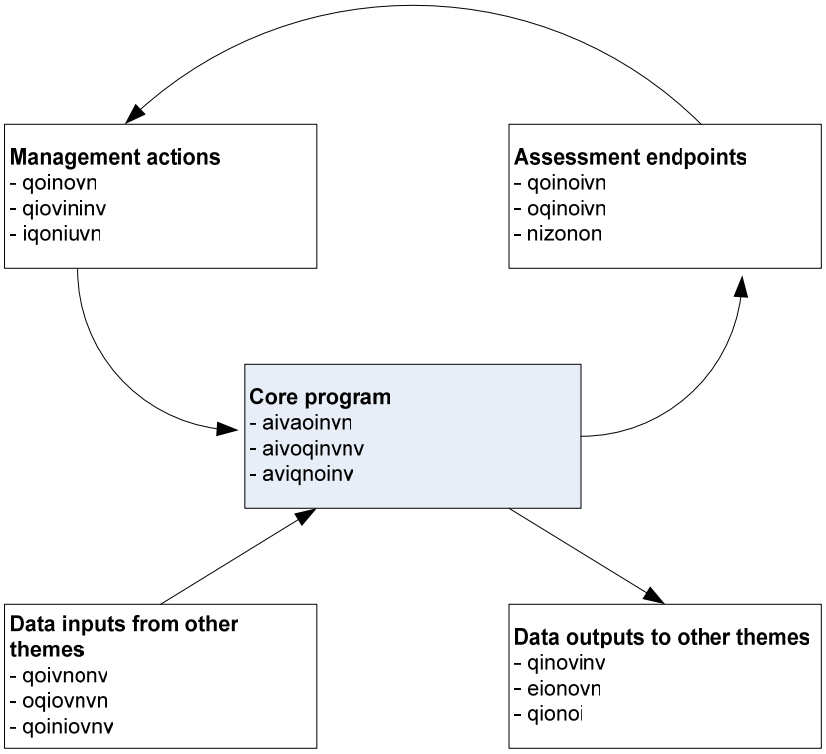

Figure 2. Schematic representation of data and information flow between the core elements of each theme-based monitoring and assessment program and other aspects of the Council's overall strategy.

Appendix 1: SB 1070 Requirements Matched to Comprehensive Strategy Components

The following table illustrates which aspects of the Monitoring Council's Comprehensive Strategy address each specific requirement of SB 1070.

SB 1070 requirement	Detail	Strategy component
Recommend improvements to monitoring	(4) The monitoring council shall review existing water quality monitoring, assessment, and reporting efforts, and shall recommend specific actions and funding needs necessary to coordinate and enhance those efforts. (5) (A) The recommendations shall be prepared for the ultimate development of a cost-effective, coordinated, integrated, and comprehensive statewide network for collecting and disseminating water quality information and ongoing assessments of the health of the state's waters and the effectiveness of programs to protect and improve the quality of those waters. (B) For purposes of developing recommendations pursuant to this section, the monitoring council shall initially focus on the water quality monitoring efforts of state agencies, including, but not limited to, the state board, the regional boards, the department, the Department of Fish and Game, the California Coastal Commission, the State Lands Commission, the Department of Parks and Recreation, the Department of Forestry and Fire Protection, the Department of Pesticide Regulation, and the State Department of Health Services. (C) In developing the recommendations, the monitoring council shall seek to build upon existing programs rather than create new programs. (6) … the monitoring council shall formulate recommendations to accomplish both of the following: (A) Reduce redundancies, inefficiencies, and inadequacies in existing water quality monitoring and data management programs in order to improve the effective delivery of sound, comprehensive water quality information to the public and decision makers. (B) Ensure that water quality improvement projects financed by the state provide specific information necessary to track project effectiveness with regard to achieving clean water and healthy ecosystems.	

Develop a comprehensive monitoring program strategy	(1) Utilize and expand upon the State's existing statewide, regional, and other monitoring capabilities and describe how the State will develop an integrated monitoring program that will serve all of the State's water quality monitoring needs and address all of the State's waters over time. (2) The strategy shall include a timeline not to exceed 10 years to complete implementation. (3) The strategy shall identify specific technical, integration, and resource needs, and shall recommend solutions for those needs.
Develop an agreement on Indicators	Agreement, including agreement on a schedule, with regard to the comprehensive monitoring of statewide water quality protection indicators that provide a basic minimum understanding of the health of the state's waters. Indicators already developed pursuant to environmental protection indicators for statewide initiatives shall be given high priority as core indicators for purpose of the statewide network.
Develop a Quality Assurance Management Plan	Quality management plans and quality assurance plans that ensure the validity and utility of the data collected.
Develop a method for compiling, analyzing, and integrating readily available information	This is to include data from waste discharge reports; volunteer monitoring groups; local, state, and federal agencies; and state and federal grant recipients of water quality improvement projects.
Develop an accessible and user-friendly electronic Data Management System	To the maximum extent possible, include the geospatial information on the data sites.
Develop a method for producing timely and complete water quality reports and lists	The reports and lists required are those required under Sections 303(d), 305(b), 314, and 319 of the Clean Water Act, and Section 406 of the BEACH Act.
Develop an update of the SWAMP needs assessment	The SWAMP program needs will change in light of the benefits of the increased coordination and integration of information from other agencies and information sources.