

SB 1070 Comprehensive Monitoring Strategy: Annotated Outline (07/20/09)

This revised outline responds to comments made at the May Monitoring Council meeting by focusing less on the details of progress during 2009 (Ch. 3) and more on the process for developing and implementing the Comprehensive Strategy (Ch. 4). Tables 2 and 3 illustrate an approach for summarizing costs and deliverables. Details on 2009 activities have been moved to Appendix 2.

Chapter 1: Introduction

- Audience for this report is Secretaries of Resources Agency and CalEPA and other interested parties in Legislature, public, and other entities involved in water quality monitoring and assessment
- 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
- The past year’s efforts have shown that the Legislature was right about the status of water quality monitoring programs and data – there was a need for a group like the Monitoring Council to fulfill a coordinating function and to ensure access to data
- The Council has been effective and has achieved significant accomplishments in its first operational year, completing four prototype web portals, establishing a functioning workgroup structure, and defining the core elements of the necessary centralized institutional and infrastructure support
- The Council’s first year of effort has provided the empirical basis for a clear plan for moving forward
- In particular, the prototype web portals have confirmed the gains in efficiency possible from the Council’s approach
- This report describes the Council’s comprehensive strategy, including specific next steps and cost estimates

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 that will support access to assessment products, underlying data, and supporting documentation
 - 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 and Lessons Learned

- Summarize major milestones, achievements, and insights, illustrated with specific examples
 - See Appendix 2 for details of progress on each element of the five-part solution

- This chapter highlights progress directly related to the Act's basic goals
- This chapter also describes lessons learned that help provide the basis for the comprehensive strategy in Chapter 4
- Validated proof of concept by taking four prototype web portals live during the year
 - Improved access to and use of data by public, decision makers, scientists
 - Achieved greater efficiencies
 - Confirmed viability of theme-specific workgroup concept
 - Enhanced broad collaboration among data sources
 - Portals revealed data gaps, inconsistencies, inefficiencies and increased the motivation for addressing these
 - Made progress toward standardization
 - Found high level of enthusiasm for the web portal concept among parties both inside and outside state agencies
- Used four prototypes as experiments to identify issues that must be addressed in comprehensive strategy; discussed more fully in Chapter 4
 - Need for flexibility in working relationships and technical approaches, given different starting points, participants, level of existing coordination, technical details
 - E.g., Safe to Swim portal developed by State Water Board but Safe to Eat and Wetlands developed externally
 - E.g., Safe to Drink's GeoTracker GAMA portal developed independently to address separate legislation and constraints, while other portals developed with input from Council
 - E.g., Wetlands workgroup includes comprehensive range of stakeholders while Safe to Swim initially focused on ocean beaches only
 - Information technology a core issue
 - Need to better link the Council's distributed database approach using CEDEN with State's evolving IT strategy
 - Divergent data formats are developing with just four portals, highlighting need for centralized mechanism to develop standards and procedures
 - Creating and maintaining map-based products across datasets and websites maintained by different organizations is challenging; keeping shadow systems updated or creating live links can require considerable work
 - Need to accommodate and integrate different spatial scales, which has important implications for GIS tools and assessment approaches
 - Need for centralized IT direction to address these and other cross-cutting issues
 - Standardization will not follow the same pathway for each theme
 - Must establish and maintain strong relationships with primary assessment entities (e.g., DPH, OEHHA)
 - Goals may differ from those of the Council
 - Web portals may already be developed (e.g., Geo Tracker GAMA) that do not follow Council's question-driven format
 - May be different policies about level of public access to raw data and assessment products
- Council will need to provide some level of ongoing technical support to workgroups
- Implemented outreach strategy to other parties named in the Act
 - Systematic effort through letters and follow-up contacts
 - Flexible responses to unexpected opportunities
 - Large increase in effort required to maintain and further develop existing relationships and to follow up on new opportunities
- Developed the Council's governance structure
- Clarified relationship with SWAMP

Chapter 4: Comprehensive Strategy

- Applies information in Chapters 2 and 3 to development of the 10-year strategy
- Two parallel but related types of effort (Figure 1)
 - Theme- and portal-specific effort (left-hand side of Figure 1)
 - Programmatic and infrastructure effort (right-hand side of Figure 1) to manage overall program, build capacity (both institutional and IT), and support workgroups
 - The Comprehensive Strategy will focus on the programmatic level, with assumption that workgroups will be self-financing by participating entities
 - Meets requirements of the Act (Appendix 1)
- Schedule, activities, and deliverables structured according to the five part solution described in December 2008 report (and in Chapter 2 above)
 - Ten-year period split into three time periods, each with a characteristic staffing and cost structure (see Table 2)
 - Start-up Years 1 – 2
 - Conduct intensive outreach and relationship building, develop Council governance, policies, and workgroup structure
 - Develop performance measures
 - Develop Council portal and prototype theme portals
 - Develop approach to standardization
 - Stay abreast of state's developing IT policies, become involved in state's IT policy development to ensure Council's requirements (e.g., sometimes pass data back and forth between state and non-state data systems) can be met, develop detailed data management strategy that avoids dead ends, implement CEDEN and regional data centers, develop data management, integration, and visualization policies
 - Development Years 2 – 8 (overlap with Start-up)
 - Continue and expand outreach, adjust Council policies, establish and support multiple theme workgroups
 - Implement performance measures to themes and adjust as needed
 - Expand and adapt Council portal as needed, support design and implementation of multiple theme portals
 - Implement standardization approach across all themes and portals
 - Integrate theme-specific datasets into CEDEN, apply state IT policies, develop data integration and visualization tools as needed
 - Long-term maintenance Years 9 – 10
 - Maintain relationships with data sources and other partners, support multiple theme workgroups
 - Apply performance measures to each theme and incorporate into statewide assessment reports
 - Support maintenance and updating of existing portals, support addition of new portals as needed
 - Maintain and update standardization scheme
 - Maintain databases and IT infrastructure, implement updates as needed, integrate new datasets as needed
 - Deliverables for each of the three program phases (see Table 3)
- Budget
 - Costs for staff, hardware and software, and contract support will be estimated according to categories in Table 2
 - Staff and contract support for all aspects except IT can be estimated based on past experience
 - Need an approach for estimating IT costs
 - Costs for IT difficult to estimate at present

- There are significant related IT policy development efforts underway led by US EPA, the Western Governors Association, the state of CA, as well as the Resources Agency and CalEPA. These policies are still being developed, and their implications for the Council's IT effort are not yet clear
 - Funding for further development of the regional data centers, intended to better characterize the technical scope and cost of SWAMP's and the Council's distributed data management system, has been frozen. As a result, costs for implementing the distributed data management system that would support the portals are not clear
 - Detailed cost estimates are usually developed as part of an FSR document; producing one is beyond the scope of this effort, particularly since it would have to be integrated with the Water Board's 5-year IT capital plan
- Sources of funding

Chapter 5: 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. Table has not been completely filled in.

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

Theme-based portals	Priority	DWR	DF&G	Coast Comm	State Lands	Parks & Rec	Forestry & Fire Prot.	DPH	OEHHA	DTSC	Waste Manag.	Water Board	NOAA	MMS
<i>What stressors and processes affect our water quality?</i>														
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													

Table 2. Overall budget structure for Monitoring Council’s Comprehensive Strategy.

Strategy Components	Ramp Up			Development			Maintenance		
	Staffing	Hardware / Software	Contracts	Staffing	Hardware / Software	Contracts	Staffing	Hardware / Software	Contracts
<i>Organizational structure</i>									
Outreach, relationships									
Governance, policies									
Establish workgroups									
Support workgroups									
<i>Performance measures</i>									
Develop measures									
Implement measures									
Technical support									
Reporting									
<i>Portals</i>									
Council portal									
Prototype theme portals									
Multiple theme portals									
Maintenance, updates									
<i>Standardize methods</i>									
Approach to standards									
Implement standards									
Maintenance, updates									
<i>Database / data management</i>									
CEDEN									
Regional data centers									
Interface w/state policy									
Develop policies									
Integrate portals w/CEDEN									
Implement state policy									
Develop tools									
Maintenance, updates									

Table 3. Deliverables for each program element in each of the three program phases.

Strategy Components	Ramp Up	Development	Maintenance
Organizational structure			
Outreach, relationships			
Governance, policies			
Workgroups			
Performance measures			
Develop measures			
Implement measures			
Technical support			
Portals			
Council portal			
Prototype theme portals			
Multiple theme portals			
Maintenance, updates			
Standardize methods			
Approach to standards			
Implement standards			
Maintenance, updates			
Database / data management			
CEDEN			
Regional data centers			
Interface w/state policy			
Develop policies			
Integrate portals w/CEDEN			
Implement state policy			
Develop tools			
Maintenance, updates			

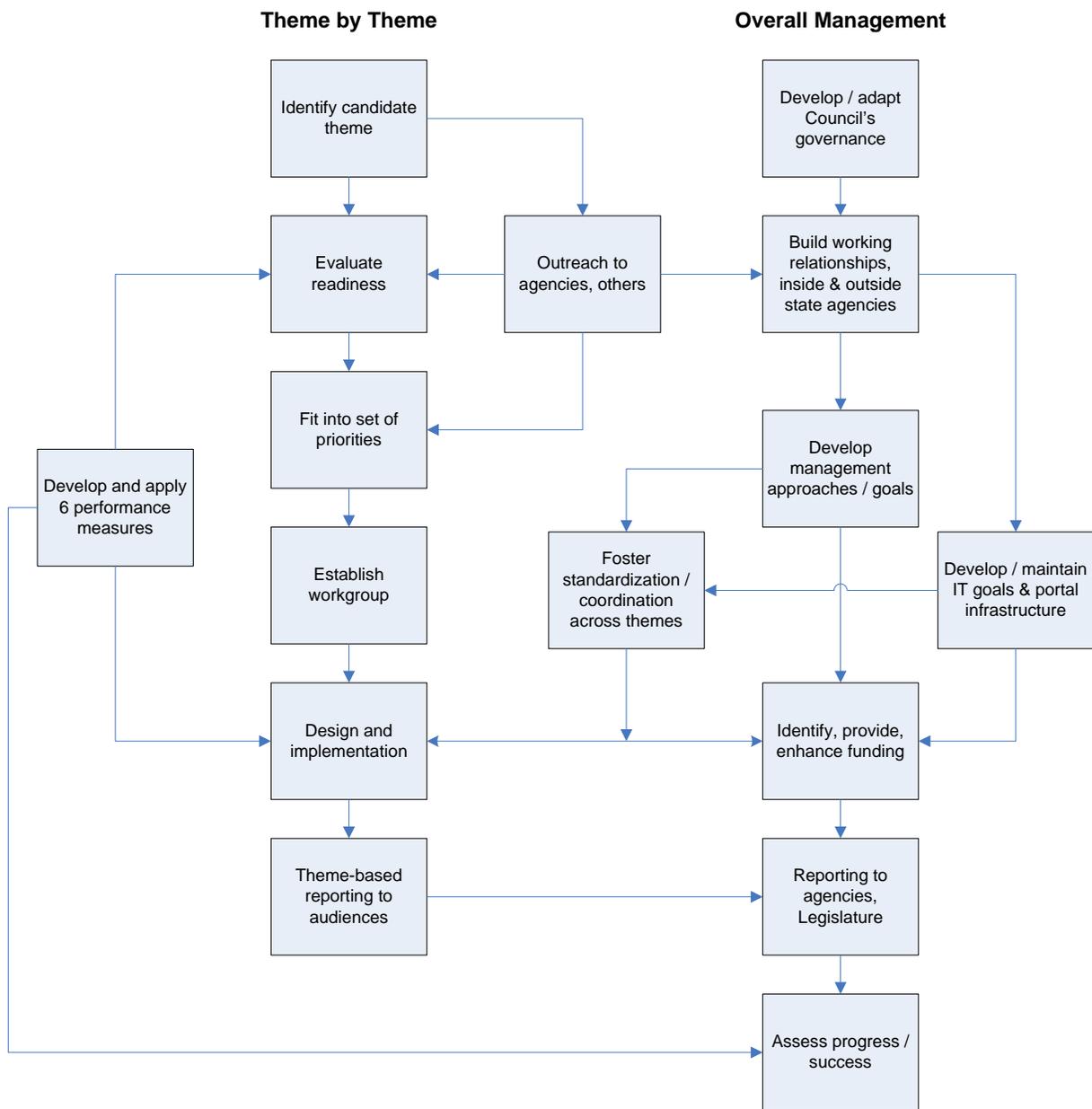


Figure 1. Parallel tracks needed to implement theme-based monitoring and assessment within the context of web portals. The Comprehensive Strategy focuses primarily on the right-hand side of the figure.

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	<p>(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.</p> <p>(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.</p> <p>(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.</p> <p>(C) In developing the recommendations, the monitoring council shall seek to build upon existing programs rather than create new programs.</p> <p>(6) ... the monitoring council shall formulate recommendations to accomplish both of the following:</p> <p>(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.</p> <p>(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.</p>	

Develop a comprehensive monitoring program strategy	<p>(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.</p> <p>(2) The strategy shall include a timeline not to exceed 10 years to complete implementation.</p> <p>(3) The strategy shall identify specific technical, integration, and resource needs, and shall recommend solutions for those needs.</p>
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.

Appendix 2: Detailed Summary of 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
<ul style="list-style-type: none"> • Program strategy, objectives, design 	<ul style="list-style-type: none"> • Monitoring strategy • Objectives • Design
<ul style="list-style-type: none"> • Indicators and methods 	<ul style="list-style-type: none"> • Indicators • QA/QC
<ul style="list-style-type: none"> • Database • Consistency of assessment endpoints • Reporting • Program sustainability 	<ul style="list-style-type: none"> • Database • Assessment • Reporting • Program evaluation • Program support

- 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