Table 1. Water quality subject area information needs.

Present information needs	Currently monitored constituents	Current method and data compatibility with other programs	Current customers	Current customer satisfaction (Are needs met? Efficiently?)	Recommendations for maintaining or improving customer satisfaction	Related future information needs and potential customers
1. Monitor to assess compliance with SWRCB salinity objectives listed in the Bay-Delta Water Quality Control Plan (SWRCB, 1995).[1]	Continuous EC measurements at specific locations; X2 position; chloride levels	Primary method is continuous monitoring of EC at fixed stations. Methods and data are highly compatible with other programs.	SWRCB, DWR and USBR Operations, DFG, FWS, CALFED, Contra Costa Water Dist., Env. and water user stakeholders	Yes needs are generally met, although efficiency gains are likely through increased coordination/ integration of existing monitoring sites with those operated by USBR and USGS	Improve/expand web-based site for one-stop shopping of EC data and USGS flow measurements	Water project operators would like information on salt field dynamics and changes over time. This would mean more directly relating EC and flow measurements.
2. Monitor to assess compliance with SWRCB dissolved oxygen objective listed in the Bay-Delta Water Quality Control Plan (SWRCB, 1995).[2]	Continuous and discrete measures of dissolved oxygen and water temperature.	Both continuous monitoring at a fixed station and more intensive discrete monitoring on a seasonal basis. Methods and data are compatible with other programs.	SWRCB, DWR, USBR, DFG, CVRWQCB, CALFED, City of Stockton, Env. and water user stakeholders	The need to assess compliance with the SWRCB water quality objective is being met. However, more recent interest in source and solution to seasonally low DO levels in the Stockton Deepwater Ship Channel have resulted in more intensive study and monitoring of this area. There is some customer concern about monitoring data quality.	Continue continuous and seasonally focused discrete monitoring. Add a bottom DO sensor at the continuous monitoring site. Work with customers to ensure data quality.	May need to increase continuous monitoring network over a select area of the San Joaquin River to assess results and compliance with a TMDL regulation for DO.

[1] Water quality objectives for salinity and chloride are included for the reasonable protection of the following beneficial uses: 1) Municipal and Domestic Supply; 2) Industrial Service Supply; 3) Industrial Process Supply; 4) Agricultural Supply; and 5) Spawning, reproduction, and/or early development. The fifth beneficial use relates to salinity objectives for the lower San Joaquin River "to protect striped bass spawning habitat."

[2] A water quality objective for dissolved oxygen levels in the San Joaquin River is for the reasonable protection of the migration of aquatic organisms. Specifically, "a dissolved oxygen objective is included to protect fall-run salmon migration in the lower San Joaquin River" (SWRCB, 1995).

Table 1. Water quality subject area information needs.

Present information needs	Currently monitored constituents	Current method and data compatibility with other programs	Current customers	Current customer satisfaction (Are needs met? Efficiently?)	Recommendations for maintaining or improving customer satisfaction	Related future information needs and potential customers
3. Document status and trends in physicochemical conditions in the upper estuary. This information is used to: 1) aid our understanding of the effects water quality conditions have on ecosystem functions and processes; 2) provide input to the planning and operation of large-scale engineered facilities and habitat restoration projects; and 3) develop hypotheses to explain the processes underlying the observed patterns and trends in the monitoring data. These hypotheses are tested through special studies.	water temperature, turbidity, dissolved oxygen, macro-nutrients, secchi disk depth, conductivity. Wind speed and direction, solar radiation, air temperature, water elevation, and pH are measured discretely or continuously at several locations in the upper estuary. See Figure 16 for station locations and Table 4 and 5 for constituent details.	Generally Standard Methods are used for the collection of discrete samples. Continuous monitoring data are collected at fixed shore-based stations using electronic sensors	CALFED and all member agencies, agricultural, municipal, and industrial users of the Estuary, environmental stakeholders, and the general public	No, customers are not satisfied. There is growing concern that the consistency of the program has declined threatening the continuity of the long-term records. There is also concern that the program has not been responsive to increases in our understanding of the system and the need to fill gaps in knowledge. There is an ongoing tension between the general nature of the monitoring program to meet the need of a baseline monitoring program and changes in program emphasis to address more specific, often short-term needs. Many customers are dissatisfied with the inaccessibility of the data and slow transfer of data into information.	Do a better job of educating customers of the needs this monitoring program is able to meet. Increase the use of web-based data dissemination and reporting tools. Re-examine the monitoring program design based on our current conceptual understanding of the system and the processes driving change. Need to carefully evaluate the use and relationship of discrete Versus continuous sampling of various constituents.	Expand the network of continuous water temperature monitoring. This information is useful to understanding and predicting fish spawning events and growth rates. All customers could benefit from this. Explicitly relate monitoring data to land use patterns and changes over time. Initial efforts should use existing aerial surveillance information. All customers could benefit from this. Make better use of web-based reporting tools and data dissemination capabilities.

Table 1. Water quality subject area information needs.

Present information needs	**Currently monitored constituents**	**Current method and data compatibility with other programs**	**Current customers**	**Current customer satisfaction (Are needs met? Efficiently?)**	**Recommendations for maintaining or improving customer satisfaction**	**Related future information needs and potential customers**
4. Provide continuous physicochemical data for use in the development and calibration of models.	Electrical conductivity (EC) and water elevation (stage)	continuous data collected from fixed, shore-based stations. Continuous data are reported every 15 minutes or every hour depending on the site. The methods are very compatible with other programs.	DWR, USBR, USGS, SWRCB, and CALFED, academic scientists and researchers, stakeholders	EC and stage data meets many customer needs. There is concern regarding the representativeness of the data, particularly downstream of X2. There is redundancy in sampling locations with other DWR and USBR programs particularly in the Delta. There is a potential for a dramatic increase in efficiency and cost savings if the various programs were combined appropriately. Sampling methods, verification, and calibration procedures do differ and may reduce compatiblity of data.	Consider lateral and vertical variability in EC, particularly downstream of X2. Expand sensor array where lateral and vertical variability is a concern (e.g., Carquinez Strait, Suisun Bay). Expand the network of continuous water temperature monitoring.	Development of a model to understand the water clarity/light dynamics in the Delta and the role it plays in primary production