

Triennial Audit of the Bioaccumulation Oversight Group - Fish and Shellfish Consumption Safety

December 2013

Fish and shellfish consumption safety is a concern in streams, rivers, lakes, coastal waters, and bays and estuaries where sport and commercial fishing, and shellfish harvesting, have been designated as beneficial uses. Both federal and state agencies have jurisdiction over this issue, but only the federal Food and Drug Administration (FDA) sets specific action levels and these only for commercial fish. California's Office of Environmental Health Hazard Assessment (OEHHA) sets risk-based thresholds for certain chemicals in sport fish as the basis for establishing site- and species-specific consumption advisories. Neither federal nor state agencies conduct systematic tissue monitoring for assessing seafood safety. OEHHA, however, has used monitoring data collected for other purposes for its advisory-related assessments, and has used the results of site-specific monitoring efforts tailored to development of consumption advisories. For example, OEHHA has used data from SWAMP's statewide assessments of sport fish tissue contamination to develop and update advisories. These SWAMP studies were designed to give a statewide screening of fish tissue contamination. Elevated levels have been found to be widespread, suggesting that more advisories are needed. However, the monitoring needed to develop these advisories is largely unfunded. A second program, coordinated by the Department of Public Health in cooperation with a number of academic and other institutions, conducts statewide monitoring of shellfish and marine biotoxins in coastal waters and bays and estuaries.

Sport Fish

Website: http://www.mywaterquality.ca.gov/safe_to_eat/

Sponsor: Bioaccumulation Oversight Group (BOG) of the Surface Water Ambient Monitoring Program (SWAMP) of the State Water Resources Control Board (SWRCB)

Description: SWAMP's sport fish tissue assessments have answered key questions about patterns of contamination in sport fish tissue in three major habitat types statewide – lakes and reservoirs, coastal environment, and rivers and streams. The focus of the first statewide surveys in lakes and reservoirs was on Clean Water Act Sections 303(d) impaired waters listing and 305(b) water quality assessment, not specifically human health risk assessment. In the subsequent surveys of the coast and rivers and streams, the focus shifted to addressing the prevalence of fishing locations where fish can be safely consumed. Coordination of smaller local and regional sport fish sampling efforts is an area for improvement.

Evaluation

Overall Summary: Substantial progress has been made in the past three years, especially in the areas of data management and reporting. A five-year effort assessing contaminants in sport fish throughout the state was completed in 2013, with an annual series of reports and fact sheets, establishment of CEDEN as a functional repository for these data, and establishment of the Safe to Eat Fish and Shellfish portal that displays the data from the statewide surveys. Limited funding remains an obstacle that has prevented definitively determining whether it is safe to eat the fish in many popular fishing locations, and the communication of the information that does exist to the fishing public.

1. Strategy, objectives, design

2010 - SWAMP's assessment asks and answers clear questions, with specific audiences (specifically 303(d) listing and 305(b) assessment) in mind; however, this strategy does not focus specifically on consumption safety, nor is it coordinated with those in the shellfish sub-theme. While the program began with an assessment of all readily available data that passed a quality assurance screening, the statewide long-term monitoring design is a combination of probabilistic sampling intended to characterize statewide conditions and targeted sampling that focuses on the most popular fishing sites. **Score: Medium**

2013 - As described above, the more recent SWAMP sport fish assessments addressed questions with a sharper focus on identifying locations where it is safe to eat fish. Given budgetary limitations, however, the surveys provided an initial screening that was not extensive

enough to allow definitive characterization of the locations sampled. In some cases the statewide surveys prompted more thorough follow-up sampling by Regional Water Boards and evaluation of data by the Office of Environmental Health Hazard Assessment (OEHHA), which resulted in a few new consumption advisories. Although substantial progress has been made through SWAMP in recent years, monitoring that would allow definitive characterization of each popular fishing location and clearly answer the core “safe to eat” question remains a significant information gap. Monitoring of trends in condition related to this question is an even greater information gap. The BOG has developed a document (“A Strategy for Coordinated Monitoring, Assessment, and Communication of Information on Bioaccumulation in Aquatic Ecosystems in California”) that provides an overarching set of goals and priority actions for improvement. However, the Strategy does not provide a roadmap to future sampling and assessment efforts.
Score: Medium

2. Indicators and methods

2010 - Indicators, i.e., tissue measurements, are standardized, with well-developed sampling and laboratory procedures. Quality assurance methods are well developed and described in the SWAMP QAPP. Data must meet SWAMP standards before entry into the SWAMP database.

Score: High

2013 - SWAMP, which is the largest source of data in the state, continues to use standardized, well-established methods for sampling and analysis, with a strong and well-documented QA program. Promoting the use of these indicators and methods by other smaller programs in the state is an area for improvement. **Score: High**

3. Data management

2010 - Data management procedures are well established, but data have yet to be placed into a readily available format usable by OEHHA and the State and Regional Water Boards. Data are currently stored at SFEI and are not yet available online **Score: Medium**

2013 - Well-established data management procedures are still followed, and now SWAMP data have been placed into a standard format and uploaded to CEDEN, where they are readily accessible to the Water Boards, OEHHA, and others. In addition, the “Safe to Eat” portal has been established and in use for the past three years, and draws data directly from CEDEN for display on the portal. The SWAMP studies provide a rich dataset to populate the portal. Inclusion of datasets from smaller regional or local programs, and from past studies, in CEDEN and the portal is an area where more work is needed. **Score: Medium to High**

4. Consistency of assessment methods

2010 - OEHHA has developed a formal data analysis framework for the purpose of developing consumption advisories and is working closely with SWAMP to implement standardized assessment methods. **Score: High**

2013 - OEHHA’s assessment thresholds continue to be used and provide a means of consistent assessment across California’s water bodies. For mercury, a new statewide tissue objective is in development that will differ slightly from OEHHA’s thresholds. Once adopted, the mercury objective will create a challenge for clearly communicating the status of each water body to the public. **Score: High**

5. Reporting

2010 - Draft reports are being prepared for the initial phases of this program to meet SWAMP’s 305(b) reporting responsibilities. OEHHA posts reports and consumption advisories on its website. The longer-term plan is to make all data available through an online interactive mapping tool being developed at SFEI for the Fish Mercury Project being funded primarily by CALFED. **Score: Medium**

2013 - From 2009 to 2013, SWAMP produced reports each year summarizing the statewide sport fish monitoring as it progressed from lakes and reservoirs, to the coast, to rivers and streams. Each year’s data were simultaneously published on the Safe to Eat portal and summarized in fact sheets. Each sampling round generated significant media coverage and public interest. The Safe to Eat portal is now a well-established source of information on contaminants in fish. Refining the presentation of data on the portal to make it more useful to

the fishing public is an area for further work. Developing a concise way of summarizing the condition of each water body, comparable to the Safe to Swim report card, is a potential area for improvement. **Score: High**

6. Program sustainability

2010 - There is no readily available description of a periodic program evaluation or planning process for either SWAMP or OEHHA, although SWAMP is currently developing a formal business plan. **Score: Low**

2013 - The SWAMP published an updated strategic plan in 2010 that will be updated every five years. The 2010 SWAMP Strategy estimated that SWAMP was funded at approximately 7 percent of the original estimate in the 2000 Needs Assessment. The SWAMP budget has experienced additional reductions in the subsequent three years while costs continue to increase. The BOG - originally a subcommittee of SWAMP - became a workgroup of the Monitoring Council but this new role was not accompanied by additional funding or strong coordination opportunities. In response to this issue and to plan for the future, the BOG has developed a document ("A Strategy for Coordinated Monitoring, Assessment, and Communication of Information on Bioaccumulation in Aquatic Ecosystems in California") that describes goals and priority actions for bioaccumulation monitoring in the state. Identifying resources for coordinating and conducting the monitoring, assessment, and communication that is needed to adaptively manage bioaccumulative contaminants in California remains a significant challenge. **Score: Low**

Shellfish

Website: Biotoxins and shellfish –

<http://www.cdph.ca.gov/HealthInfo/environhealth/water/Pages/Shellfish.aspx>

Sponsor: Department of Public Health

Description: The Department of Public Health's Pre-harvest Shellfish Protection and Marine Biotxin Monitoring Program monitors commercial shellfish growing areas in conformance with the National Shellfish Sanitation Program. The Program also monitors numerous points along the California coastline for marine biotoxins in shellfish and toxigenic phytoplankton in marine waters. Warnings are issued or quarantines are established as needed for recreational and commercial shellfish harvesting. These programs are separate and not coordinated. No significant changes have occurred for this program over the past three years, so the performance measure scores are unchanged.

Evaluation:

1. Strategy, objectives, design: The program asks and answers clear questions, with specific audiences in mind. The objective has been clearly stated and is to describe broad trends over time, and CDPH's objective is to establish sanitary requirements for shellfish growing waters and to regulate commercial growing and harvesting to ensure shellfish are safe for human consumption. The monitoring design is based on national guidelines promulgated by the Food and Drug Administration, although these allow for a degree of local flexibility. Monitoring is conducted by a wide range of collaborating local partners and is more organized and consistent for shellfish growing sites than for phytoplankton and toxins in marine waters.
Score: High (with a need for more coordination of phytoplankton and toxin sampling)
2. Indicators and methods: Taxonomic methods for phytoplankton identification and methods for the direct measurement of marine biotoxins are not standardized. However, NOAA is organizing a nationwide methods intercalibration study for 2009, with the goal of improving standardization of methods for species identification and estimating abundance, as well as for toxin identification and measurement. Laboratory quality assurance methods are defined in a national procedure manual, however, there is no readily available information on the degree to which these standards are met, or on data checking and validation methods further along the data path.
Score: Medium
3. Data management: There is no readily available information on data management procedures. However, the program produces aggregated statewide reports, which requires that data be collected and housed in a statewide database. The program does not provide users a means to access and download data. However, it has recently implemented a statewide listserv to enable participants to more readily share data and results.
Score: Medium
4. Consistency of assessment methods: Standardized data summarization approaches are used, with assessment thresholds applied to data on toxin levels in shellfish as a basis for regulatory decisions. However, there may be need to develop assessment thresholds for phytoplankton and toxins in marine waters.
Score: High
5. Reporting: The program regularly produces monthly, quarterly, and annual reports, which are posted on the program's website. However, users cannot create reports based on individual criteria.
Score: High
6. Program sustainability: There is no readily available description of a periodic program evaluation or planning process.
Score: Low