

Introduction

This document comprises the technical appendices to *The State of San Francisco Bay 2011* (SFEP 2011), a science-based assessment of the health of the San Francisco Bay. The following appendices provide detailed descriptions of the background and rationale, data sources, and methods of calculation for the indicators used to evaluate the health of the Bay. In addition, an indicator that could be utilized in future evaluations of the Bay by SFEP is described.

Indicator Screening Process

The ecological indicators described in *The State of San Francisco Bay 2011* were selected from a group of indicators identified by previous authors (Gunther and Jacobson, 2002; Thompson and Gunther, 2004; The Bay Institute 2003; 2005), and additional potential indicators identified by the authors of *The State of San Francisco Bay 2011*. These candidate indicators were screened using a modified version of the Watershed Assessment Framework developed by the US Environmental Protection Agency. The framework was developed to evaluate the suitability of potential indicators for assessing watershed conditions and trends and to relate management program goals and objectives to ecological conditions. The framework identifies six key attributes that describe the features of an ecological system:

- Landscape condition
- Biotic condition
- Chemical/physical characteristics
- Hydrology/geomorphology
- Ecological processes
- Natural disturbance

The first level of indicator selection criteria evaluated the conceptual relevance of the proposed indicator to the above attributes and to the goals and objectives of the Comprehensive Conservation and Management Plan (SFEP 1993). The results of the initial screening process are presented in *Assessment Framework as a Tool for Integrating and Communicating Watershed Health Indicators for the San Francisco Estuary* (SFEIT 2011), available via the SFEI website (<http://www.sfei.org/documents/assessment-framework-tool-integrating-and-communicating-watershed-health-indicators-san-fr>).

The selection criteria for indicators are shown in Table 1. It is important to note that the “Transferability” category employed in the initial evaluation of indicators to be selected for calculation in SFEIT (2011) was not relevant to the final evaluation of indicators to be included in *The State of San Francisco Bay 2011*. Therefore, indicators that were excluded for calculation based solely on non-transferability were not excluded from *The State of San Francisco Bay 2011*. For example, the Estuarine Open Water Habitat indicator was not calculated in SFEIT (2011) because it could not be transferred to other watersheds, but was included in *The State of San Francisco Bay 2011* as an important regional indicator.

Peer Review

The data, methods, and analysis used to compile *The State of San Francisco Bay 2011* were drawn from many different sources. These include papers in the peer-reviewed literature, ongoing monitoring programs, or publications from respected organizations in the region. These various sources utilize peer review to ensure the credibility and authority of their products, and

so it was not deemed necessary (nor economically feasible) for *The State of San Francisco Bay 2011* to be developed using a completely independent peer review process. However, SFEP sought peer review of all the methods and analysis to provide a document that was authoritative and useful.

Consequently, the peer review of the material presented in the following technical reports took many forms. For some of the indicators described, published methods and analysis in peer-reviewed literature were used in the evaluation. Other indicators were evaluated using methods that had been developed with input from scientific advisory panels for previous assessments of the Bay, such as the *Ecological Scorecard* (The Bay Institute 2003; 2005). Some ongoing monitoring programs, such as the Regional Monitoring Program, have technical review committees and periodically empanel independent reviewers to assure their methods and analysis are credible (Bernstein and O'Connor, 1997; Berger *et al.* 2004). In addition, the authors of the individual technical reports that follow sought review by knowledgeable colleagues from the Bay Area scientific community.

SFEP invites any readers of these Technical Appendices who have specific comments to forward these in writing to Judy Kelly, Executive Director of SFEP. It is fully expected that this report will generate a wide array of comments, and SFEP expects to integrate these comments into preparations for a future State of the Bay report in an effort to continue to refine indicator selection and analysis.

Table 1: Selection criteria for watershed assessment indicators for the San Francisco Estuary.

| (Indicator Name) | | | | |
|--|-------------|--------------|-----------|----------|
| | Result | WAF category | CCMP Goal | Comments |
| | (yes or no) | | | |
| Conceptual Relevance | | | | |
| Fits with WAF category (ecological function) | | | | |
| Fits with CCMP (management objectives) | | | | |
| Data Availability and Adequacy | | | | |
| Data available | | | | |
| Data suitable quality | | | | |
| Responsiveness | | | | |
| Driver-outcome linkage | | | | |
| Sensitivity | | | | |
| Response time frame | | | | |
| Spatial sampling frame | | | | |
| Interpretation | | | | |
| Goals, thresholds or reference conditions defined | | | | |
| Meaningful to public | | | | |
| Transferability | | | | |
| Scalable | | | | |
| Transferable to other watershed | | | | |

References

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