

## Examples of Managing for Sustainability

A number of concurrent efforts are underway at the regional, State, and federal levels that have as their goals managing natural resources more sustainably. Brief descriptions of these efforts are furnished below.

**Alliance for Water Stewardship:** Alliance for Water Stewardship (AWS) was formed in 2008 because of the clear need for a coherent international framework for responding to freshwater challenges (<http://www.allianceforwaterstewardship.org/>). AWS is working with stakeholders including businesses, water service providers, governments, civil society and non-profit organizations to develop a voluntary International Water Stewardship Standard through an equitable, transparent, science-based, multi-stakeholder process. There will be third-party verification to determine whether the Standard has been met; a global brand that allows managers, users and organizations to demonstrate their compliance with or support for water stewardship; and training to promote achievement of water stewardship. The first draft of the International Water Stewardship Standard was released in March 2012 ([http://www.allianceforwaterstewardship.org/assets/documents/AWS\\_Standard\\_First\\_Draft\\_v\\_03\\_13\\_2012.pdf](http://www.allianceforwaterstewardship.org/assets/documents/AWS_Standard_First_Draft_v_03_13_2012.pdf)). While the AWS Standard is international in scope, its application will be based around successful local partnerships through which decision-making on watershed-level actions are developed by all those with a stake in water management. The AWS Standard defines a set of water stewardship steps, principles, criteria, and indicators for how water should be stewarded at a site and watershed level in a way that is environmentally, socially, and economically sustainable. Ongoing updates may be found at [www.allianceforwaterstewardship.org](http://www.allianceforwaterstewardship.org).

**The Bay Institute's Ecological Scorecard Project:** This project produced the San Francisco Bay Index, the first comprehensive effort using scientific indicators to measure the health of the Bay (<http://bay.org/publications/%C2%ADecological-scorecards>). This unique "report card," first released in 2003 and updated in 2005, helped inform people about how the Bay was doing, and helped to track progress in reducing pollution, conserving water, and restoring habitat.

The 2003 San Francisco Bay Index used more than three dozen science-based indicators to grade the condition of the Bay region: how well its ecological resources were faring, how much human activities were harming or helping the Bay, and how human uses of the Bay's resources were affected by the Bay's health. These indicators were combined into eight Indexes that tracked the Bay's environment (Habitat, Freshwater Inflow, Water Quality), its fish and wildlife (Food Web, Shellfish, Fish), our management of its resources (Stewardship), and its direct value to the people who use it (Fishable-Swimmable-Drinkable). The grading system compared conditions in the Bay and its watershed to historical conditions, environmental and public health standards, and restoration targets.

The 2005 San Francisco Bay Index updates and refines those results, using new and additional data where available. In 2011, the San Francisco Estuary Partnership, created by the State of California and the USEPA, released "The State of San Francisco Bay 2011." The new report was co-authored by scientists from The Bay Institute and the Partnership specifically acknowledged the importance of the Bay Institute's Ecological Scorecard as the basis for many of the report's indicators and a valuable model for a science-based assessment of the ecological health of the Bay.

**California Healthy Community Indicators Project:** The California Department of Public Health (CDPH) developed the Healthy Community Framework through an extended, grassroots community engagement process. This framework is the work product of a Health in All Policies Task Force. The Task Force is part of SGC and composed of high level representatives of 18 non-health state agencies and CDPH. CDPH has assembled a draft, preliminary, core list of indicators that links the framework's aspirational goals to evidence and data that are valid, frequently updated, and geographically relevant to potential local, regional, and state users. The preliminary set of indicators is being revised and vetted, and pilot implementation projects have begun with local health departments and other stakeholders on their use in their organizations. Over the next 2 years, CDPH will be making a considerable effort to research and develop a set of "Healthy Community Indicators" that includes much of the content of the social determinants of health.

**California Healthy Streams Partnership:** As an interagency workgroup of the California Water Quality Monitoring Council, the Healthy Streams Partnership (HSP) is devoted to monitoring and assessing the quality of California's stream and river ecosystems and bringing the resulting information to decision makers and the public via the internet. A major intent of the HSP is to promote the protection of California's healthy streams and the restoration of threatened and impaired streams by informing and encouraging changes in present perspectives and resource management decision and actions. Thus, it could function as the bridge between assessed conditions and desired conditions of a given stream. Based on recommendations of the HSP and guidance from the Monitoring Council, the Healthy Streams web portal was developed to present information about the extent and condition of California's stream and river ecosystem resources and linked from the Monitoring Council's My Water Quality website (<http://www.CaWaterQuality.net>). The My Water Quality website provides access to a number of portals that together house a wide collection of water quality and ecosystem health information about the state's lakes, rivers, streams, wetlands, and ocean waters. The goal is to provide timely information in an easy-to-understand manner for the public, environmental organizations, and water quality professionals. As one of seven Monitoring Council workgroups, the HSP is exploring models for developing indices that translate the various data types into a report card format that provides an assessment of overall stream and river condition.

**The California Water Foundation:** The California Water Foundation (CWF; [www.californiawaterfoundation.org](http://www.californiawaterfoundation.org)) is an initiative of Resources Legacy Fund (<http://www.resourceslegacyfund.org>). Since its founding in 2000, Resources Legacy Fund (RLF) has embodied an innovation in conservation philanthropy as a donor-driven enterprise focused on lasting results. RLF provides a unique mix of capabilities to deliver outcomes that improve environmental sustainability in Western North America as well as in oceans and fisheries worldwide. CWF advances solutions to meet the water needs of cities, farms, and the environment of California, today and into the future. CWF is developing the Sustainable Water Management (SWM) Profile as a standardized assessment tool to identify the biggest water management stressors facing a region, evaluate an agency's response to those stressors, and develop a composite score and final rating. The SWM Profile seeks to increase water supply sustainability by highlighting water agencies' successes and vulnerabilities, encouraging sound investments, policies, and regional coordination. Using indicators and metrics, the SWM Profile will evaluate stressors within four main themes (supply, demand, environment, and finance) to determine if a region's water is being sustainably managed. CWF is working to pilot the new sustainability tool with a water agency, learn from this pilot, further refine the tool, and apply it in other regions.

**The Delta Plan:** Delta Vision Task Force established in 2008 concluded that Delta problems could not be solved in isolation – they were inextricably linked to statewide water supply, habitat, and flood management programs – and that stronger governance and accountability were a must. In response, the Legislature, water agencies, and environmental groups throughout the state united in 2009 to pass a series of water-related measures that included the Delta Reform Act. The Delta Reform Act established coequal goals of a more reliable water supply for California and protecting, restoring, and enhancing the Delta ecosystem as overarching State policy. The Act also created the Delta Stewardship Council (DSC) with the authority and responsibility to develop a legally enforceable Delta Plan, and to ensure that actions by State and local agencies in the Delta are consistent with the Plan (<http://deltacouncil.ca.gov/>).

After more than 2 years of extensive effort, public outreach, and stakeholder input, the Final Staff Delta Plan was released in May 2012 ([http://deltacouncil.ca.gov/sites/default/files/documents/files/DeltaPlan\\_05-14-2012.pdf](http://deltacouncil.ca.gov/sites/default/files/documents/files/DeltaPlan_05-14-2012.pdf)). The Plan relies on a mix of legally enforceable policies and essential recommendations to prioritize actions and strategies for improved water management, ecosystem restoration, and levee maintenance. The Plan has formulated a set of administrative, output, and outcome performance measures to monitor progress toward achieving the Coequal Goals. Existing monitoring efforts (such as the efforts of the Interagency Ecological Program, California Water Quality Monitoring Council, and California Statewide Groundwater Elevation Monitoring) will be utilized to inform progress toward achieving the performance measures in the Delta Plan.

**Strategic Growth Council (SGC):** The SGC is a cabinet level committee established in 2008 by Senate Bill 732 that is tasked with coordinating the activities of member state agencies to support sustainable land, air, and water conditions and community well-being (<http://sgc.ca.gov/>). The 2010 California Regional Progress Report published by the SGC presents a framework for measuring sustainability based on twenty integrated, place-based quality-of-life regional indicators ([http://dot.ca.gov/hq/tpp/offices/orip/Collaborative%20Planning/Files/CARegionalProgress\\_2-1-2011.pdf](http://dot.ca.gov/hq/tpp/offices/orip/Collaborative%20Planning/Files/CARegionalProgress_2-1-2011.pdf)). Regional-scale issues such as air quality, housing affordability, vehicle miles traveled and electricity use form the basis for assessing the combined impact of regional outcomes on the state's sustainability. The Department is coordinating with SGC in order to more closely align the indicator analysis carried out in SGC's Regional Progress Reports with the Framework. In the first iteration of this coordination, water sustainability indicators may be adopted by the SGC regional reports as the method to measure this aspect of environmental, economic, and community well-being.

**Sustainable Water Resources Roundtable:** Since 2002, the Sustainable Water Resources Roundtable (SWRR) has brought together State, federal, corporate, nonprofit, and academic sectors to advance understanding of the nation's water resources and to help develop tools for understanding and ensuring their sustainability (<http://acwi.gov/swrr/index.html>). As part of its mission, SWRR developed a framework of water sustainability indicators in 2005 for tracking and understanding changes to the health of the nation's fresh and coastal waters, surface and ground water, wetlands and watersheds ([http://acwi.gov/swrr/Rpt\\_Pubs/prelim\\_rpt/index.html](http://acwi.gov/swrr/Rpt_Pubs/prelim_rpt/index.html)). SWRR identified a set of four sustainability principles for water resource management – 1) the value and limits of water, 2) shared responsibility, 3) equitable access, and 4) stewardship. SWRR has developed a set of 14 key sustainability indicators under five major foci of water sustainability – 1) System capacities, quality and allocation, 2) Consequences of the way we allocate water capacity, 3) Effects on people of the conditions and uses of water resources, 4) Important factors affecting water resources, and 5) Composite sustainability assessment. SWRR has also

developed a pathway to further understanding water sustainability indicators with a project agenda for 2012-2014 that include assessment of indicators, water footprint tools and quantification of energy requirements and carbon emissions, a flexible framework for indicators, a tool for water sustainability index, and a watershed management handbook. More information on SWRR's project agenda for 2012-2014 can be found at [http://acwi.gov/swrr/proceedings/SWRR-Proceedings\\_May2012\\_Meeting.pdf](http://acwi.gov/swrr/proceedings/SWRR-Proceedings_May2012_Meeting.pdf).

**USEPA California Sustainability Indicators Suite:** California communities' future health and prosperity are fundamentally tied to sustainable water management. Communities are facing challenges like increasing population, aging infrastructure, groundwater depletion, degraded ecosystems, and climate change. To address these challenges, USEPA has undertaken the development of a suite of sustainability indicators for California that includes the water footprint. As part of this effort, USEPA is collaborating with DWR and UC Davis to develop the California Water Sustainability Indicators Framework, which, as noted previously, includes water sustainability indicators and a decision support tool to aid in indicator assessment and decision making.

The key objective of the USEPA project is to begin an informed conversation at the national level on the following uses of the water footprint, through the example of California's water footprint.

**Water footprint as a sustainability index for a population:** A water footprint, defined as the total volume of fresh water that is used to produce goods and services consumed by a population, can be used as an index of appropriation of water resources by a state like California or by another well defined geographical region in its agricultural, industrial, and domestic sectors. The California Water Sustainability Indicators Framework includes a state-wide water footprint as an index of human impacts to the water environment.

**Water footprint as a water resource management and strategic planning tool:** The ratio of the internal to external water footprint highlights the degree to which a state like California has externalized its water footprint by importing water-intensive goods. As a net virtual water importer, California's water strategic plans may take into account the vulnerability of water import dependency. As the population grows, California may use more water than it actually controls because of its ability to import the virtual water required for its population. As global water supply and demand balances change, water-rich regions are likely to reduce the amount of virtual water they export, leaving import-dependent regions without enough water to sustain their populations' current consumption patterns. In addition, water footprint helps illustrate different levels of water use by various sectors, which can help with high-level allocation decisions and can also help in developing targeted water efficiency measures.

**Water footprint as a communication tool:** The California water footprint can credibly illustrate the demands placed on water resources and hence is a powerful tool for raising awareness of the need to reduce this overall burden. For example, showing that 90 percent of a typical consumer's water footprint is embodied in products, with only 10 percent used directly in the household and yard, can highlight the water-related financial risks to which consumers would be exposed should access to water resources become further constrained, which could encourage voluntary changes in consumption behavior. A state's use of a water footprint to report environmental and economic conditions could encourage regions, cities, corporations, and water utilities to follow suit in similar reporting.

**Water Footprint as an indicator of water quality impacts:** The "grey water" footprint, defined as the volume of freshwater necessary to dilute polluted water to an acceptable standard, constitutes a

hypothetical impact on water resources and can inform water quality assessments.

Funding to develop California's Water Footprint has come from the USEPA's Advanced Monitoring Initiative and DWR. The USEPA project also funded the preparation of a first-ever California-wide Ecological Footprint. The indicators suite also includes statewide indicators derived from satellite remote-sensing data -- a plant growth index and a total water and groundwater flux indicator. A web-based decision-support tool comprising the entire USEPA indicator suite and the California Sustainability Indicators Framework will appear as a Global Earth Observation System of Systems project (see <http://indicators.ucdavis.edu>). Collaborators include USEPA's Office of Research and Development, DWR, UC Davis, NASA's Jet Propulsion Laboratory, California State University - Monterey Bay, and US Geological Survey.

**USEPA Healthy Watersheds Initiative:** The Healthy Watersheds Initiative (HWI) focuses on protecting healthy aquatic ecosystems that have intact biota, habitat, physical processes, and natural disturbance regimes. The USEPA recognizes that aquatic ecosystems are dynamic and interconnected in the landscape. Therefore, a systems-based approach is used to assess and protect healthy watersheds encompassing landscape condition, connectivity and hydrologic and geomorphic processes. The HWI is being implemented through partnerships to develop state-scale healthy watersheds strategies that prioritize protection and restoration.

The USEPA is funding an effort to provide the State Water Board's Surface Water Ambient Monitoring Program with technical support in conducting an integrated, multimetric assessment to identify healthy watersheds throughout California. An integrated and strategic approach incorporates multiple elements of ecological integrity and their interconnections. These include: 1) landscape condition, 2) habitat, 3) hydrology, 4) geomorphology, 5) water quality, and 6) biological condition. The goal of the California Healthy Watersheds Assessment is to produce an "aggregated analysis of whole system conditions" based on these six elements. The California Healthy Watersheds Assessment will build on previous work and use existing data to demonstrate the linkages between aquatic ecosystem components and the landscape of which they are a part. Data and guidance are being provided by California's Healthy Streams Partnership and the Water Quality Monitoring Council. The results of this effort will be made available through the Healthy Streams web portal.

**Watershed Health Scorecards for the Sonoma Creek Watershed and Napa River Watershed:** The Watershed Health Scorecard's purpose is to provide, in a highly accessible format, information that is needed for adaptive, responsive, and transparent watershed management. The Scorecard identifies and evaluates a carefully selected set of indicators that reflect basic watershed functions. Tracking these indicators over time will help evaluate the effectiveness of contemporary approaches to watershed management, and answer the question "Are we managing our natural resources in a sustainable manner?" The 2010 Water Quantity Scorecards for Napa River and Sonoma Creek Watersheds completed the water availability topic of an overall Watershed Health Scorecard. The Water Quantity Scorecards are based primarily on data for water year 2007, the most recent year for which data were available. The project was a collaborative effort among Sonoma Ecology Center, the Napa County Resource Conservation District, and numerous technical partners, to answer the question: "How is our watershed doing in terms of supplying quantities of water needed to support human and ecosystem uses?" The resulting scorecards and supporting technical reports can be viewed at <http://sfcommons.org/scorecards/>.