



Guidance for Addressing Climate Change in California Coastal Conservancy Projects

March 2012

Purpose

The purpose of these *Guidance* documents is to provide grantees and Conservancy staff clarification, information and resources to assist in understanding and applying the Conservancy's adopted *Climate Change Policy* and *Project Selection Criteria* (adopted June 2009, amended November 2011). It is also intended to be a resource for developing responses to questions in the Conservancy's Grant Application, including the project description in Part A, and the additional questions in Part B that pertain to projects with goals and objectives potentially impacted by climate change. Because climate change science is rapidly developing, the Conservancy is committed to incorporating emerging research and public and peer review comments into periodic updates of this climate change guidance. To this end, we encourage readers and users to provide input and comments regarding the guidance through the following email address: climate@scc.ca.gov.

Background

There is broad scientific consensus that humans are changing the chemical composition of our atmosphere through the buildup of pollutants that cause global warming. Activities such as fossil fuel combustion, deforestation, and other changes in land use result in the accumulation of greenhouse gases (GHGs) such as carbon dioxide (CO₂), methane (CH₄), and a suite of other GHG compounds in the atmosphere. Black carbon (soot) is also a major contributor to climate change and is produced from diesel engines, forest fires and other sources.

Increases in GHG emissions result in an increase in the Earth's average surface temperature, which is commonly referred to as global warming. Climate models predict that annual temperatures in California will increase by 1 to 2°C by 2050 and by 2 to 6°C by 2100. Summer temperatures in the state may increase by as much as 3°C within the next 50 years, and heat waves and extreme temperatures are expected to become more common and severe. Global warming is expected, in turn, to affect weather patterns, average sea level, ocean acidification, chemical reaction rates, precipitation rates, and other climactic and geographic variables. Alterations in physical and chemical processes

will combine to significantly increase stressors on natural systems, including aquatic and terrestrial species.

Significant shifts in species' use of habitats, and changes in rainfall and snowmelt patterns and timing are already being observed and will accelerate in the future. Warming has already impacted the seasonal timing of flowering, leaf emergence, fall bird migration, and insect emergence. Sea level rise (SLR) is already occurring, with National Oceanic and Atmospheric Administration (NOAA) records showing eight inches of rise over the last century in San Francisco.

A changing climate requires us to modify how we conceive, design, and implement most natural resource, public access and recreation projects. Previously, planning assumptions were based on a fairly static view of landscapes, habitats and land use changes. We now need to assume that there will likely be dramatic changes in the physical and biological environment, as well as in demographics as more Californians choose to live close to the coast and bays where it is cooler.

Introduction

The Conservancy's overall approach to addressing climate change impacts and implementing its *Climate Change Policy* and *Project Selection Criteria* in Conservancy-funded projects is to assist prospective grantees in:

- developing clear project goals and objectives with consideration of climate change impacts at the outset of project planning;
- assessing project vulnerabilities, including from SLR, extreme events, as well as stressors to species and habitats, along with the likelihood and means of achieving targeted goals and objectives under a range of climate change scenarios;
- developing robust adaptive management strategies and monitoring programs; and
- identifying, evaluating and incorporating reasonable measures to reduce greenhouse gas emissions generated by the project.

The Conservancy can be viewed as a resource for advice regarding interpretation and incorporation of state climate change policies into your project planning. For example, in response to concerns about the physical, economic, social and environmental impacts resulting from SLR along the California coast, the Governor issued Executive Order S-13-08, requiring state agencies to assess a range of SLR scenarios and incorporate SLR into planning and decision making. State agencies, working collaboratively with scientists, developed an interim sea level rise guidance, and the California Ocean Protection Council (OPC) adopted a resolution that provides recommendations for how state agencies should prepare for and incorporate SLR projections into planning and management decisions. The Executive Order also called for the National Academy of Sciences to develop recommendations for conducting SLR assessments (expected to be

released in the fall 2012). We anticipate that climate change science and policy will continue to rapidly evolve, and will provide assistance to prospective grantees in interpreting and incorporating updates into your planning and project designs.

Contents

This *Guidance* is organized around the major topics within the Conservancy's adopted *Climate Change Policy* and *Project Selection Criteria*. These include 1) addressing project greenhouse gas emissions, 2) vulnerability to sea level rise, and 3) vulnerability from other climate change impacts. The *Guidance* also provides an overview of recorded and predicted impacts of climate change, a framework for adaptive management, and an appendices which includes five useful reference documents. More specifically, the *Guidance* contains the following materials:

Section I: Addressing Project Greenhouse Gas Emissions

This section addresses project greenhouse gas (GHG) emissions and pertains to application questions #10 and #13 (Part 2). The Conservancy must find that all projects meet California Environmental Quality Act (CEQA) requirements which may include evaluation of GHG emissions. In addition, the Conservancy's policy is to encourage and support projects that incorporate reasonable measures to reduce emissions. This section contains information on the following:

- An overview about why the GHG policy and project selection criteria were adopted;
- The specific language pertaining to the Conservancy's GHG policy and project selection criteria;
- A discussion about the purpose of the GHG *Guidance* and the approach the Conservancy is using to implement it;
- Additional information about the recently adopted CEQA requirements for GHG emissions;
- Suggested steps and actions to address a project's GHG emissions;
- An overview of emissions estimation methodologies;
- An overview of GHG mitigation and reduction approaches and opportunities; and
- An overview of considerations regarding carbon sequestration and carbon credits.

Section II: Overview of Climate Change Impacts (Available in April 2012)

This section will include a summary of the climate change impacts that have been scientifically documented to date, as well as those that are predicted to occur to physical and ecological resources along California's coastline, within the ocean, and within coastal watersheds and terrestrial areas.

Section III: Adaptive Management (Available in April 2012)

This section will provide a framework for adaptive management and information about baseline and periodic monitoring. It provides information that can be incorporated into the grant application project description, and question #6 in Part B.

Section IV: Vulnerability to Sea Level Rise

This section of the *Guidance* pertains to information that is needed to respond to questions contained within the Conservancy's application including the project description and question #11 (Part B). It describes potential sea level rise (SLR) impacts and considerations to be factored into planning, siting and design of shoreline projects, drawing extensively on two key state policy documents that contain recommendations pertaining to how to incorporate SLR into project planning and decision making. One of these documents is the *State of California Sea-Level Rise Interim Guidance* (October 2010) that was developed collaboratively by a state agency task force of the Coastal and Ocean Working Group of the California Climate Action Team (CAT), with science input from the California Ocean Protection Council's Science Advisory Team and the California Ocean Science Trust. The CAT *Interim Guidance* provides projections of sea-level rise by specific dates and provides a risk-based approach for evaluating sea-level rise, extreme events and shoreline change. The other key document is the *Resolution of the Ocean Protection Council on Sea-Level Rise*, adopted on March 11, 2011, which provides further guidance on assessing sea-level rise and impacts from storms and is applicable to state agencies and entities implementing projects funded by the state. The *CAT Guidance* and the *OPC Sea-Level Rise Resolution* are attached in their entirety as Appendix VI.3 and VI.4, respectively.

Collectively, this section of the *Guidance* and its associated appendices should assist you in addressing the following topics pertaining to a shoreline project:

- What is the appropriate time horizon to consider based on the expected life of the projects?
- What predicted SLR should be applied?
- Are there local conditions such as subsidence or uplift that will affect the extent of SLR?
- Are there predicted changes to shoreline processes that will affect your project?

- Are there predicted extreme events that will impact your project?
- What are the resources that will be impacted?
- How will increased intertidal ranges impact your project; and,
- What monitoring is needed?

Section V: Vulnerability from Other Climate Change Impacts (Available in 2012)

This section addresses other impacts likely to occur from climate change with a focus on observed and predicted impacts to habitats and species, and to a lesser extent stream flows and agricultural resources. It contains a description of how to assess your project's vulnerability to climate change, how to develop management responses to predicted vulnerabilities, a description of general approaches to adaptation, and recommended approaches to managing stream flows. This section is intended to assist prospective applicants in preparing responses to the grant application regarding the project description, and questions # 2, 3, 5, 6, and 12 in Part B.

Section VI: Appendices

This section includes five useful documents:

VI.1 Best Management Practices Checklist for Project Grantees. This document describes best management practices that can be incorporated into projects to reduce GHG emissions through energy and water conservation, waste reduction, and materials selection. The BMPs are presented in a checklist format in categories that pertain to Conservancy projects, including: pre-project planning and project criteria, construction activities and structures, transportation management, education and outreach, and water conservation.

VI.2 Methodology for Calculating GHG Emissions and Reductions. This document provides detailed guidance for how to calculate GHG emissions from projects, and for identifying and evaluating GHG reduction opportunities and for determining their cost effectiveness.

VI.3 State of California Sea-Level Rise Interim Guidance Document, October 2010. This document was developed by 16 state agencies that participated in the Sea-Level Rise Task Force of the Coastal and Ocean Working Group of the California Climate Action Team with science support provided by the Ocean Protection Council's Science Advisory Team and the California Ocean Science Trust. It was developed in response to a directive in Governor's Executive Order S-13-08 that state

agencies consider a range of SLR scenarios to assess project vulnerability, reduce expected risks, and increase resiliency to sea-level rise. It provides guidance for incorporating sea level rise into planning and decision-making for projects in California.

VI.4 Resolution of the California Ocean Protection Council on Sea Level Rise, March 11, 2011. This resolution advances the *Interim Guidance Document* adopted by state agencies by calling for reduction of the pollutants that cause climate change, stating that state agencies should include consideration of SLR when making funding decisions, and stating that state agencies should follow the recommendations in the *Interim Guidance Document*, including the sea-level rise projections and consideration of a project's timeline, adaptive capacity, and risk tolerance when selecting estimates of SLR.

VI.5 Annotated Bibliography of Climate Change Adaptation and Greenhouse Gas Reduction Resources (VI.5 available in April 2012). This document includes resources organized by topics related to the Conservancy's grant application including calculation of green house gases, vulnerability to sea level rise, vulnerability from other climate change impacts, and monitoring and adaptive management. It also contains a list and description of other useful resources including websites, reports and books.