# Climate Resilience Leadership Workshop Summary

## Introduction

Climate change and extreme weather events pose complex risks to cities all over the world. The increase in global urbanization means that a large and growing proportion of the world's population could be impacted by a suite of interrelated impacts from climate change (Revi et al., 2014). Increasing the resilience, or "the capacity of a community to prevent, withstand, respond to, and recover from a disruption" (U.S. Federal Government, 2014), requires a variety of actions that engage the many sectors and communities that comprise a city.

People must prepare for and adapt to the impacts of climate change today. Cities are experiencing increases in temperatures already, and those trends are expected to continue. Climate change will impact not only the built environment, but also the social infrastructure of cities (Cutter et al., 2014). Because urban communities are culturally and socioeconomically diverse, as well as systemically complicated, climate change and extreme weather events will impact people differently even within a single city—not only because of where they live, but also because of who they are.

The City of Long Beach is in its very early stages of understanding its vulnerabilities, but city leaders are committed to creating a model climate resilient city. In 2015, Mayor Robert Garcia joined the Compact of Mayors, an international coalition of mayors making commitments to reduce and adapt to climate change (Edwards, 2015). In so doing, Mayor Garcia named the Aquarium of the Pacific as a strategic partner in the effort. The Aquarium of the Pacific subsequently authored the City of Long Beach Climate Resiliency Assessment Report in December 2015 (Aquarium of the Pacific, 2015). Based on the best available scientific data, published literature, and expert and stakeholder input, this report describes the climate change risks most relevant to Long Beach: drought (and freshwater shortages), extreme heat, sea level rise, and poor air quality.

The Aquarium of the Pacific has planned a broad-reaching education strategy to reach community stakeholders to build awareness and momentum for climate resilience. This strategy includes long-term community engagement, raising awareness about climate resilience among community leaders and increasing community leaders' capacity to talk about climate through a series of workshops, and helping the public understand climate risks and resources available to them through outreach booths and events.

## Workshop Overview

The Aquarium of the Pacific pilot-tested the first three-day Climate Resilience Leadership Workshop on August 25 – 27, 2016. This workshop is intended to bring together a unique, multi-disciplinary group of community leaders from the City of Long Beach interested in working to help make the city a model of Climate Resilience. Workshop attendees were recruited from several community groups in Long Beach. The workshop highlighted climate change issues and solutions at a variety of scales through activities, group discussion, and the expertise of invited scientists. The workshop was designed to address seven key messages:

- Climate change is the result of human consumption of fossil fuels that contribute to an increase in heat-trapping gases around the Earth; this heating has been leading to many different global impacts.
- Climate change is observable and happening now.
- Mitigating and adapting to climate change must also happen now. Building resilience will be necessary to protect our communities from a variety of climate impacts.

- Resilience is defined as “the capacity of a community, business, or natural environment to prevent, withstand, respond to, and recover from a disruption.” (U.S. Federal Government, 2014).
- Immediate climate change related threats to Long Beach, CA, include drought (and freshwater shortages), extreme heat, sea level rise, and poor air quality.
- Because urban communities are culturally and socioeconomically diverse, as well as systemically complicated, climate change and extreme weather events will impact people differently even within a single city—not only because of where they live, but also because of who they are.
- Long Beach has the creativity, ingenuity, community, and commitment to be a model city for climate resilience.

## Day One – Global Climate Change

The first day of the workshop commenced with a brief introduction and overview by David Bader, followed by presenter and attendee introductions. Emily Yam and Alie Lebeau followed the introduction with a “Climate 101” presentation, which provided an overview of climate science first principles. The presentation combined hands-on activities, discussion prompts, and videos to provide attendees with a baseline understanding of climate change science and to develop a shared vocabulary and understanding of terms that will recur throughout the workshop. These activities and foundational principles were informed by the Education Department’s on-going work as a member of the National Network of Ocean and Climate Change Interpreters (NNOCCI). Hands-on activities and demonstrations gave participants the opportunity to discuss and observe different sources of sea level rise and principles of heat-trapping gases. Attendees were also challenged to consider their experiences and reflect on potential impacts of climate change on the city of Long Beach. Impacts aligned into a few emergent themes: human health, crime, home values and costs, heat impacts, tourism, and residential landscaping. ***Group discussion revealed that, while participants seem confident with their knowledge about climate change, there were some common misconceptions about various aspects of climate change science that warranted the overview. Careful pre-workshop evaluation may help identify some of these ideas in the future.***

The “Climate 101” overview was followed by a talk from Dr. Jason Keller, a professor at Chapman University in Orange, CA. Dr. Keller’s laboratory studies carbon and nutrient flow through different systems. The talk, entitled, “Exploring Blue Carbon in Southern California Salt Marshes,” emphasized the critically important role wetlands (particularly local, coastal wetlands) play in mitigating and adapting to the current and future impacts of climate change. In addition to the habitat they provide for other organisms, wetlands serve as a buffer protecting the coastline from the impacts of extreme weather. On shorter time scales, wetlands also have the potential to store 10-100x more atmospheric carbon dioxide ($CO_2$) than terrestrial forests. Keller’s presentation sparked a discussion on restoration of existing wetland areas, and whether those activities were viable options in Long Beach. More information on existing adaptation projects and research may be necessary so that participants can see tangible, real-life adaptation efforts going on in their neighborhoods.

## Day Two – Local Impacts of Climate Change

Day Two commenced with comments from David Bader, providing a brief overview of Day One content, transitioning to day two’s focus on climate change impacts that impact Long Beach today. Since impacts are observable and measureable today, access to, and familiarity with data products relevant to Long Beach is essential for building resilience. The introduction was followed by an interactive presentation by Emily Yam, entitled “Data are Everywhere.” During the talk, participants worked in pairs then reconvened as a group to discuss the public’s perceptions of the word *data*. This was followed by

interpretation exercises that examined several different types of visualizations, including a word cloud visualization developed from their previous day's discussion. When prompted to consider immediate climate impacts on Long Beach, emergent themes from the group activities aligned well with the four main threats identified in the City of Long Beach Climate Resiliency Assessment Report published in December 2015 (Aquarium of the Pacific, 2015). Based on the best available scientific data, published literature, and expert and stakeholder input, this report describes the climate change risks most relevant to Long Beach: drought (and freshwater shortages), extreme heat, sea level rise, and poor air quality.

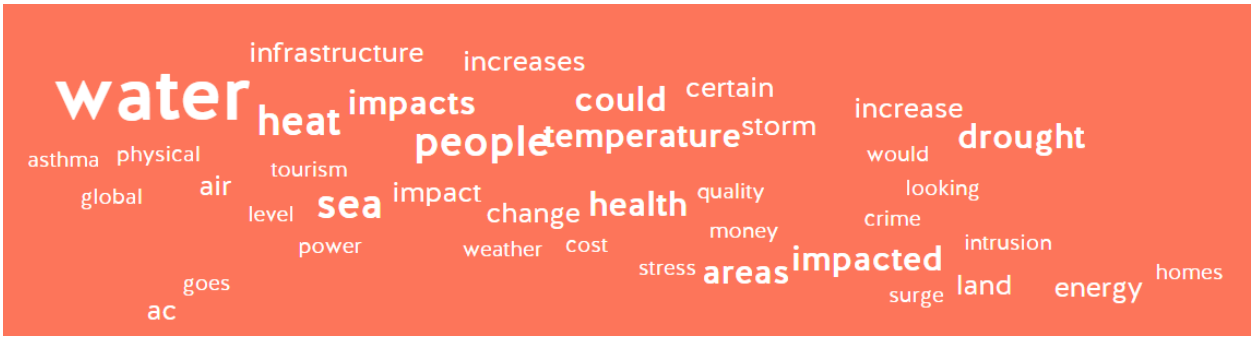


**Figure 1. Word cloud visualization of perceived climate impacts on Long Beach.**

Participants investigated and reflected upon current data resources further by exploring various types of available climate data using NOAA's Climate Explorer app (https://toolkit.climate.gov/climate-explorer2/). The toolkit allows users to examine graphs and maps of both historical and projected climate data. In particular, workshop attendees were prompted to examine temperature, precipitation, and cooling degree days in an area important to them.

Once they became familiar with the types of data that exist and how to make meaning of these models, invited guest speaker Dr. Juliette Hart (United States Geologic Survey) presented a data-rich case study of sea level rise in Long Beach using similar visualizations. Dr. Hart's presentation, "Sea Level Rise in Long Beach from Global to Local" provided more in-depth information about how sea level rise, particularly when combined with storm surge and increasingly severe storms, could impact the LA and Long Beach area now and in the future. The day ended with a brief presentation by Dr. Jennifer Lentz, who presented a review of the four main climate-related factors threatening Long Beach (drought, heat, sea level rise and coastal flooding, and deteriorating air quality), how each of these factors impact human health and how socially vulnerability (or lack thereof) can exacerbate (or alleviate) the impacts of these factors on communities. Sea level rise was incidentally a relevant topic to most of the participants, many of whom live on the eastern side of Long Beach (Belmont Shore, Peninsula, and Colorado Lagoon areas). However, in efforts to generate discussion that would be more widely applicable to attendees from other areas in Long Beach, future workshops will focus on other impact areas. The addition of pre-workshop surveying will help to guide the expert lecturers and the topics of discussion. Additionally, giving community leaders tools beyond data-driven products may empower them to engage their communities more deeply in impacts and solutions relevant to them.

### Day Three – Community Level Solutions

The final day of the workshop commenced with a brief review of the first two days, followed by a small group activity on scaling solutions to match the problem. The activity, nicknamed "Me to We," prompted participants to envision climate solutions at the community, city, and state/federal levels for a variety of sectors: transportation, energy, food, landscaping and land use, business, homes and buildings, and waste. Small groups discussed a variety of solutions for 2-3 sectors and presented them to the whole group during a broader discussion. Each small group discussion included a facilitator from the

Education Department. ***In these discussions, participants disproportionately suggested mitigation-based solutions instead of adaptation solutions, even when prompted to consider specific adaptation ideas.*** As an example, suggested regional-level solutions for the energy sector could be parsed into mitigation and adaptation solutions:

*Mitigation Solutions*
Push local government to become solar-powered
Install solar on city buildings, businesses, and apartments
Consider energy storage systems and back up (in light of last year's power failures)

*Adaptation Solutions*
Cooling stations during heat waves

***Given that general public discourse on climate solutions is mitigation-based, the tendency to prefer those solutions is not surprising. However, resilience building requires both mitigation and adaptation. While discussion was rich, this activity will be redesigned in the future to emphasize adaptation strategies.*** The workshop concluded with a presentation and conversation with Larry Rich, Sustainability Officer for the City of Long Beach. Rich provided a brief overview of projects currently underway (or recently completed) within the city and whether each project would be considered mitigation or adaptation. Participants asked questions about the programs, especially in comparison to other major municipalities' comparable programming. Much like the conversation earlier that day, mitigation activities were highlighted more than adaptation strategies.

## NEXT STEPS

The Education Department will be hosting its next Climate Resilience Workshop on November 9-10, 2016 on the campus of California State University, Long Beach. Based on facilitator reflection of program goals and this pilot workshop, the following changes will be made to the program:

- Pre-workshop evaluation will help facilitators understand common misconceptions of attendees. Facilitators can then prepare to address and begin to dispel some of these misconceptions through best practices in climate interpretation (as an extension of on-going work through the NNNOCI project).
- Different recruitment techniques may be used to generate attendance that is more diverse and representative of the City of Long Beach. There may be future workshops focused on small geographic areas or common areas of interest (cultural, faith, social justice, etc).
- Rather than a focus on data literacy, interpretation, and data-driven products on Day Two, the Education Department may test a new approach. Because attendees are leaders in their home groups, the next pilot workshop at CSULB will focus on building the capacity of these leaders to address climate change with their communities. Day Two's new, central theme will be on best practices on communicating climate change. Providing opportunities for participants to practice using tools like value-based messaging and well-tested metaphors (heat trapping blanket, regular vs. rampant carbon production) will give them the baseline skills to start a dialog on climate resilience with their communities. As such, leaders will be specifically asked to commit to an activity or action post-workshop. Day Two at the CSULB workshop will also include time to develop marketing messages and/ or sound bites to deliver climate change messages that start discussions on solutions.
- The workshop will have a new emphasis on adaptation strategies from the start. In order to generate more discussion on climate resilience and things communities can do today. The Solutions activity will examine a different scaling issue: instead of various levels of communities (city, state, federal), participants will be asked to consider their different circles of influence

when considering solutions. Workshopping adaptation solutions will also center on three main questions that will help participants reflect on solutions for today's climate impacts:

- Is this solution an example of climate adaptation?
- Is this solution scalable to match the problem?
- Is the solution sustainable (e.g., can it continue beyond your actions today?)

As a whole, the August 2016 pilot workshop generated lively discussion and participants were engaged and provided positive feedback. Changing community discourse and building awareness about climate resilience is a long-term process; the Education Department is committed to continuing to develop, test, and support climate resilience initiatives into the future.

**Appendix 1: Workshop Flyer:**


Photographer: D. Ramey Logan

**A Climate Resilient City is a city able to continue to function in the face of challenging circumstances due to climate change, and to recover quickly from disruptions.**

Join your fellow community leaders and the Aquarium of Pacific in building Long Beach as a model for a Climate Resilient City. Experts will guide you through a series of three workshops addressing the immediate, near term, and long term challenges Long Beach will face from Climate Change, including increased heat, drought, rising sea level, and reduced air quality. Through this leadership workshop, you will work with Long Beach community leaders to frame strategies that will help ensure Long Beach as a vibrant community for generations to come.

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| **Dates:** | August 25, 26, and 27, 4:00pm to 7:00pm |
| **Location:** | Aquarium of the Pacific, Watershed Classroom |
| **RSVP:** | educate@lbaop.org |

**Appendix 2: Workshop Attendee List**

| Name |
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| David Bader |
| Emily Yam |
| Alie LeBeau |
| Jennifer Lentz, PhD |
| Lori Perkins |
| Cassandra Davis |
| Jason Keller, PhD |
| Juliette Finzi Hart, PhD |
| Larry Rich |
| Stella Ursua |
| Curtis Desilets |
| Linda Weingartner |
| Christine Jocoy, PhD |
| Lily House-Peters, PhD |
| Carrie Metzgar |
| Christine Houston |
| Anish Patel |
| Taylor Thomas |
| Robert Kalayjian, MD |
| Sylvia Palomera |
| Fern Nueno |
| Al Weingartner |
| Sona Coffee |
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