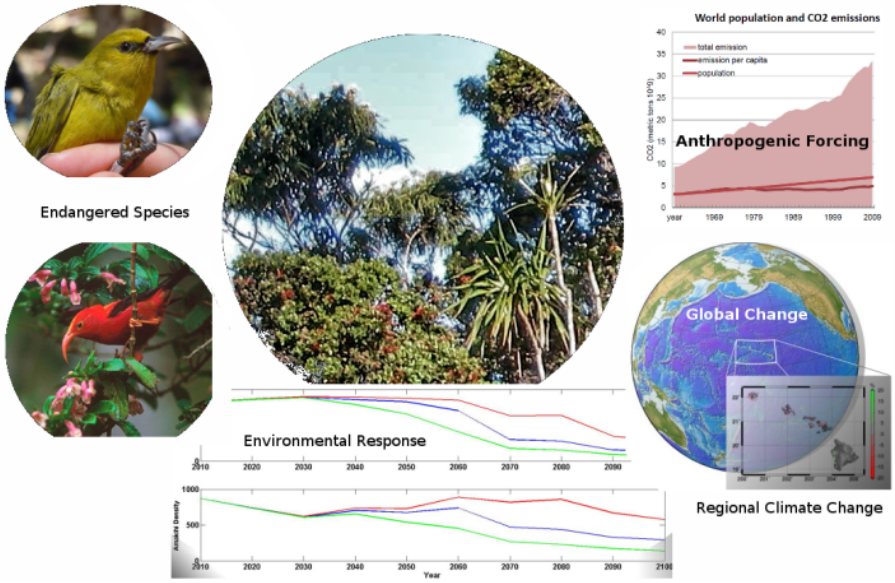
Workshop on
Regional Climate Change
and Environmental Response in Hawaiʻi



Asia Room - Imin International Conference Center

University of Hawaiʻi at Mānoa Campus

hosted by the International Pacific Research Center

July 22-23, 2014

UNIVERSITY of HAWAIʻI MĀNOA

INTERNATIONAL PACIFIC RESEARCH CENTER

Purpose of the Meeting

Regional climate change research is dealing with the problem of estimating the physical changes in the natural environment on a local scale, whereas the driving forcing is acting on a global scale. A number of research projects sponsored by the Pacific Islands Climate Science Center (PICSC) and the Pacific Islands Climate Change Cooperative (PICCC) are currently in-vestigating new scientific data, methods and techniques to monitor environmental changes and to investigate their causes, and to model future environmental changes under a changing climate. One particular goal is to connect the physical global climate science with the biological sciences to understand how ecosystems respond regionally to time-dependent climatic changes. The primary goal of this workshop is to improve the mutual understanding for the scientific research methods in the two disciplines and to strengthen trans-disciplinary information exchange.

In this 1 1/2-day workshop, we will bring together researchers that actively work on the regionalization of climate change scenarios for Hawai‘i, and researchers in leading roles of understanding the consequences of climatic changes on ecosystems, biogeographic changes and bio-dynamical changes in Hawai‘i.

The first day will give participants the opportunity to present their research results to the audience and to communicate the latest information to the participating researchers. Ample of discussion time is planned in, which will allow participants to engage in scientific debates.

Day two is intended to direct the discussions towards research solutions and scientific conclusions. In breakout groups, the participants will discuss in-depth the strengths and weaknesses of current research methods/ data, evaluate confidence/ uncertainty of research results, and identify solutions or improvement that appear most promising to advance our knowledge about regional environmental changes.

Expected Outcomes

The workshop is expected to foster collaboration among the different PICSC-sponsored projects, to increase the awareness and understanding of the various scientific research methods and data products. Further, we want to enhance the overall communication among researchers with a wide range of different expertise. This includes (but is not limited to):

- Quantify the effects of climate change on complex ecosystems or selected species
- Identify possible feedbacks between biological changes and regional climate changes
- Find quantitative ways to track and measure uncertainties in the research process
- Define a priority-list of climate-change variables for environmental impact studies
- Foster the communication between ‘producers’ and ‘users’ of climate information

Agenda

Day 1 - July 22, 2014

(All times is Hawaiʻi Standard Time (HST))

8:00-8:30am Setup
8:30-8:45am Registration
8:45-8:50am Opening Remarks & Announcements
8:50-9:00am Introduction of participants

Session 1: Climate Change in Hawaiʻi: Recent Trends and Future Projections
Chair: Tamara Wong, Jon Price

The physical aspects of regional climate change and confidence/uncertainty assessments

9:00-9:15am Henry Diaz, NOAA, ESRL Boulder, CO
Enhanced warming with elevation: Projections and observational evidence

9:15-9:30am Ryan Longman, Dept. of Geography, University of Hawaiʻi at Mānoa
Temporal solar radiation change at high elevations in Hawaiʻi

9:30-9:45am Pao-Shin Chu, Dept. Meteorology, University of Hawaiʻi at Mānoa
Regional precipitation extremes in Hawaii under non-stationary climate conditions: Statistical modeling and dynamical downscaling

9:45-10:00am Kevin Trick, David Field, Hawaii Pacific University
Better understanding and quantifying the association between large-scale climate and the variability in rainfall on the main Hawaiian Islands

10:00-10:15am Maoya Bassiouni, Pacific Islands Water Science Center, US Geological Survey
Development of statistical methods to estimate future baseline and low-flow characteristics of ungauged streams in Hawaiʻi

10:15-10:30am Short presentations:
David Beilman, Dept. Geography, University of Hawaiʻi at Mānoa
Victoria Keener, East-West Center, Pacific RISA
Matthew Widlansky, IPRC, University of Hawaiʻi at Mānoa
Oliver Elison Timm, DAES, University at Albany

10:30-10:45am Break

Session 1: Climate Change in Hawaiʻi: Recent Trends and Future Projections

(Chair: Tamara Wong & Jon Price)

10:45-11:00am Thomas Giambelluca, Dept. of Geography, University of Hawaiʻi at Mānoa
Observed and projected changes in Hawaiʻi's climate.

11:00-11:30am Dieter Mueller-Dombois, Dept. Botany, University of Hawaiʻi at Mānoa
Biotic Impoverishment & Climate Change: Global Causes of Forest Decline?

11:30-12:15 Discussion 1: Climate Change in Hawaiʻi
(Moderators: Erik Franklin & Aurora Kagawa-Viviani)

Climate change group leading discussion: Critical review of the methods, explaining sources of uncertainty, quantification of confidence ranges, synthesis of current results: agreement and ambiguity in the downscaled scenarios.

12:15-1:45pm Lunch Break
(see map for lunch options on campus)

Session 2: Environmental & Ecosystem Response to Climate Change

Chair: (David Field & Oliver Elison Timm)

The scientific aspects of environmental and ecosystem response to climate change

1:45-2:00pm Jim Jacobi, Pacific Island Ecosystems Research Center, U.S. Geological Survey
Developing the revised HI-GAP land cover map and Hawaiian Islands habitat quality map

2:00-2:15pm Tamara Wong, Jonathan Price, Jim Jacobi, Dept. of Geography and Environmental Sciences, University of Hawaiʻi at Hilo, and PIERC
Modeling climate-driven changes to dominant vegetation in the Hawaiian Islands

Session 2: Environmental & Ecosystem Response to Climate Change

Chair: (David Field & Oliver Elison Timm)

The scientific aspects of environmental and ecosystem response to climate change

2:15-2:30pm Kirsten Oleson, Dept. of Natural Resources and Environmental Management, University of Hawaiʻi at Mānoa

Using ecosystem service modeling to support ridge-to-reef management and conservation in Hawaii and the Pacific

2:30-2:45pm Erik Franklin, Hawaii Institute of Marine Biology, University of Hawaiʻi at Mānoa

Future coral community projections for the Hawaiian Islands

2:45-:3:00pm Tiffany Anderson, Charles Fletcher, SOEST, University of Hawaiʻi at Mānoa

A practical approach to mapping shoreline change under future sea level rise scenarios

3:00-3:15pm Break

3:15-3:30pm Eben Paxton, USGS Pacific Island Ecosystems Research Center

Are recent population trends in Hawaiian forest birds linked to climate change?

3:30-3:45pm Wei 'Joy' Liao, Mike Samuel, University of Wisconsin-Madison

The effects of climate change on avian malaria and Hawaiian forest birds

3:45-4:00pm Rick Camp, Hawaiʻi Cooperative Studies Unit, University of Hawaiʻi at Hilo

Changing climate and the altitudinal range of avian malaria in the Hawaiian Islands - an ongoing conservation crisis on the Island of Kauaʻi

4:00-4:15pm Break

4:15-5:00pm Discussion 2: Projected Environmental Changes in Hawaiʻi

(Moderators: Thomas Giambelluca & Abby Frazier)

Ecosystem Response group leading discussion:
Critically assess our latest research progress, exchange methods that can improve research at the interfaces across our disciplines, discuss experiences with importing climate change products (usage intentions and caveats), strategic planning for future products.

5:00pm End of Day 1

Day 2 - July 23, 2014

Breakout group meetings

9:00-10:30am Breakout Groups

(a) Research methods in regional climate change: Current status, limits, and future directions
Chair: Henry F. Diaz & Matthew Widlansky
(b) Research methods in regional ecosystem changes: Current status, limits, and future directions
Chair: Kirsten Oleson & Lauren Kaiser
(c) Exchange of information between two research disciplines: data formats, metadata, and communication
Chair: Victoria Keener & Maoya Bassiouni

10:30-10:45am Break

10:45am-12:15pm Final Discussion

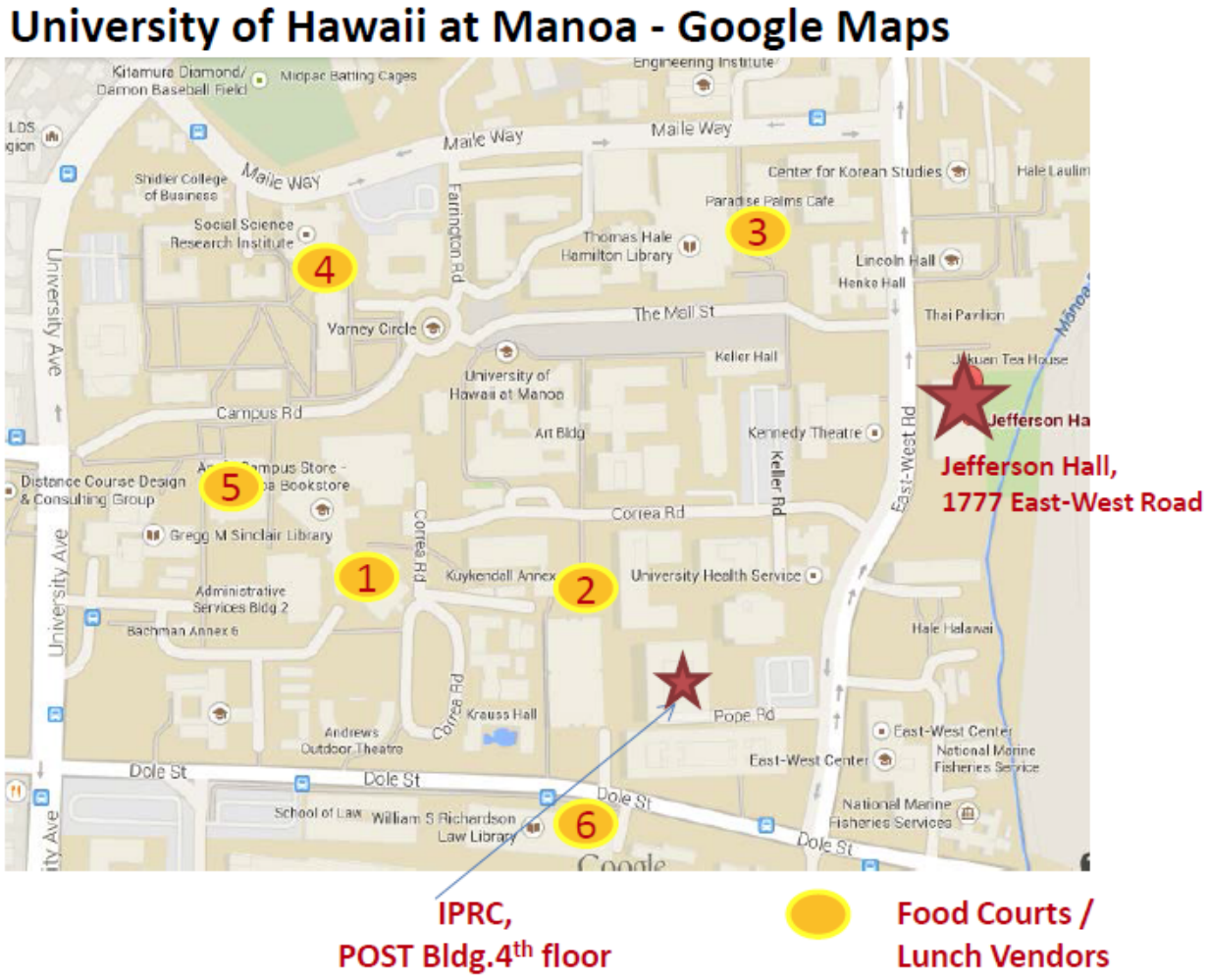
(a) Reports from the breakout groups
(b) Recommendations for future research strategies, collaborations, and communications

12:15pm End of Workshop

(Afternoon: Key PIs drafting workshop report for PICSC)

Local information:

The Imin International Conference Center is located 1777 East-West Road on the UH Manoa. Note on the UH-Campus Map it is called "Jefferson Hall" (Building #70)



Regular Bus services between Waikiki and Campus (Routes #13 serves Dole Street and East-West Street , #4 serves the 'Ewa' (west side) on University Ave). Fares are $2.50 with on transfer option (2-h time limit). Visit http://www.thebus.org/ for more details.

Notes

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