

3rd Moorea IDEA Workshop - UC Berkeley, November & December 2014

Location

[University of California, Berkeley](#), California, USA

Dates

20-22 November, 2014

and a follow up Working Meeting on Moorea Social-Ecological System 8-10 December, 2014

Conveners

Neil Davies (UC Berkeley)

Dawn Field (Oxford)

Matthias Troyer (ETH Zurich)

Serge Planes (CNRS-EPHE)

Sally Holbrook (UC Santa Barbara).

Local Organizing Committee

Neil Davies (UC Berkeley)

George Roderick (UC Berkeley)

others...

Sponsors

UC Berkeley - Vice Chancellor for Research

Berkeley Initiative in Global Change Biology

France-Berkeley Fund

Theme

Special sessions will include a 1-day workshop on *Moorea Experimental Garden Array (MEGA)* and Community Genomics on 21 November, supported in part by a grant from the Berkeley Initiative in Global Change Biology (BIGCB).

A second session (working meeting) will take place on 8-10 December on the *Moorea Social-Ecological System (MoSES)*, supported in part by a grant from the France-Berkeley Fund (Claudet and Davies).

Welcome Letter

Dear Moorea Avatar Workshop Participants,

Planning - based on discussions from the 2nd Workshop (Oxford)

Overview:

- Day 0: arrival
- Day 1:
 - Morning - Introductions and updates, discussion of charter to formally establish IDEA Consortium
 - Afternoon - presentation of new components (TBD) and discussion of how to integrate them into the avatar
- Day 2:
 - Morning Plenary followed by breakouts, including BIGCB workshop
- Day 3: Synthesis and actions (depart evening or next day)

Day1 - Thursday 20 Nov.

Introduction

- Grand Challenge
- Avatar vision

Progress Reports

- Coral / Algal Time Series CATS Model
- Greg's logo for Avatar
- 4D mapping status
- Education Outreach Interface

New Components -

- Energy
- Water - Hydrology [CZO]
- Waste-Management
- Transport
- Urban Planning /Land Use
- Food - Agriculture/Fisheries/Aquaculture [Food Institute]
- Tourism
- Health - Healthy Communities Institute

Day 2 - Friday 21 Nov.

After a plenary session the meeting could break up into separate working groups. One of which will be a workshop focusing on biodiversity genomics:

Biocode: Moorea Experimental Garden Array (MEGA)

- 1-day workshop co-sponsored [Berkeley Initiative in Global Change Biology](#)

Keynote - Tom Whitham (Northern Arizona University) - NSF Southwest Experimental Garden Array ([SEGA](#)): A New Research Instrument to Explore the Genetics of Plant Adaptation to Climate Change.

- SEGA is a common garden instrument for examining climate change, genetic and environmental factors affecting plants and associated communities (soil fungi, insect herbivores, etc.) of those plants. Currently, 10-12 common garden sites are planned across northern Arizona. Research focuses on the community-level understanding of the consequences of plant genetics and climate change on foundation plant species and their dependent communities.

Future phases of the Moorea Biocode Project (Genomic Observatory) will target the “interactome”, the biotic interactions now that we have characterized the players. The microbiome and extended communities of foundation species will be a major component of this effort. Garden arrays add an experimental approach to assess how genotype and environment interact to shape communities. Following the keynote, three plenary panel sessions will address issues and opportunities for (i) corals, (ii) trees, and (iii) modeling data from genomic observatories. Invited panelists will give short presentations to frame the issues in marine and terrestrial environments respectively.

Panel 1: Moorea Coral Reefs - Experience in marine environments will draw on the coral reef teams on Moorea and Oahu (Polynesian Genomic Observatory) that are transplanting corals and building up towards the first full scale marine experimental garden arrays. Potential panelists include: **Jonathon Stillman (UC Berkeley)** Physiological responses of corals to climate change; **Veronique Berteaux (CNRS CRIOBE)** Coral transplantation experiments between Moorea, Tahiti, and Bora Bora; **Hunter Lenihan (UC Santa Barbara)** Demographic study of coral recovery following massive disturbance event (cyclone, COTS invasion); **Ruth Gates - Oahu (Hawaii Institute of Marine Biology)** coral-microbial interactions in the ‘symbiome’.

Panel 2: Moorea Forests - Experience in terrestrial environments will draw on the Moorea Biocode Project, and NSF Dimensions of Biodiversity Projects: Potential panelists include: **Brent Mishler (UC Berkeley)** Plant-plant interactions in tropical forests of Moorea; **Matteo Garbelotto (UC Berkeley)** Ecological effects of invasive plant microbiomes across environmental gradients on Moorea; **George Roderick (UC Berkeley)** Plant-insect interactions in Polynesian forests; **Steve Shuster (NAU)** Interspecific indirect genetic effects.

Panel 3: Data Science - How can the data generated through Biocode MEGA feed into the Moorea Commons (place-centered computational platform) and multi-scale modeling efforts to understand future states of the Moorea ecosystem under alternative environmental scenarios - Potential panelists include: **Rich Williams (PEaCE Lab)**, **Cherie Briggs (UC Santa Barbara)**, **Neo Martinez (Univ. Arizona)**, **John Deck (UCB)**

Lunch

Breakouts -

In the afternoon, the workshop will split into marine and terrestrial breakout groups, with data scientists divided among them, to work on detailed plans for implementing a Moorea Experimental Garden Array (MEGA).

Key products will include (a) a perspective paper that addresses the value and challenges of establishing experimental garden arrays in the tropics (particularly on coral reefs) in order to advance a “Genomic Sustainability” approach that considers the evolutionary effects of global change, and (b) a road-map for establishing the MEGA and a draft funding proposal.

Dinner

Day 3 - Saturday 22 Nov.

Synthesis - Next Steps

Depart 4pm

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