

# Welcome

*OTEC:  
Assessing Potential  
Physical, Chemical &  
Biological Impacts & Risks*



Coastal Response Research Center

*OTEC:  
Assessing Potential Physical, Chemical &  
Biological Impacts & Risks*

June 22 - 24, 2010

Nancy E. Kinner  
Coastal Response Research Center  
(**CRRC**)  
UNH Co-Director



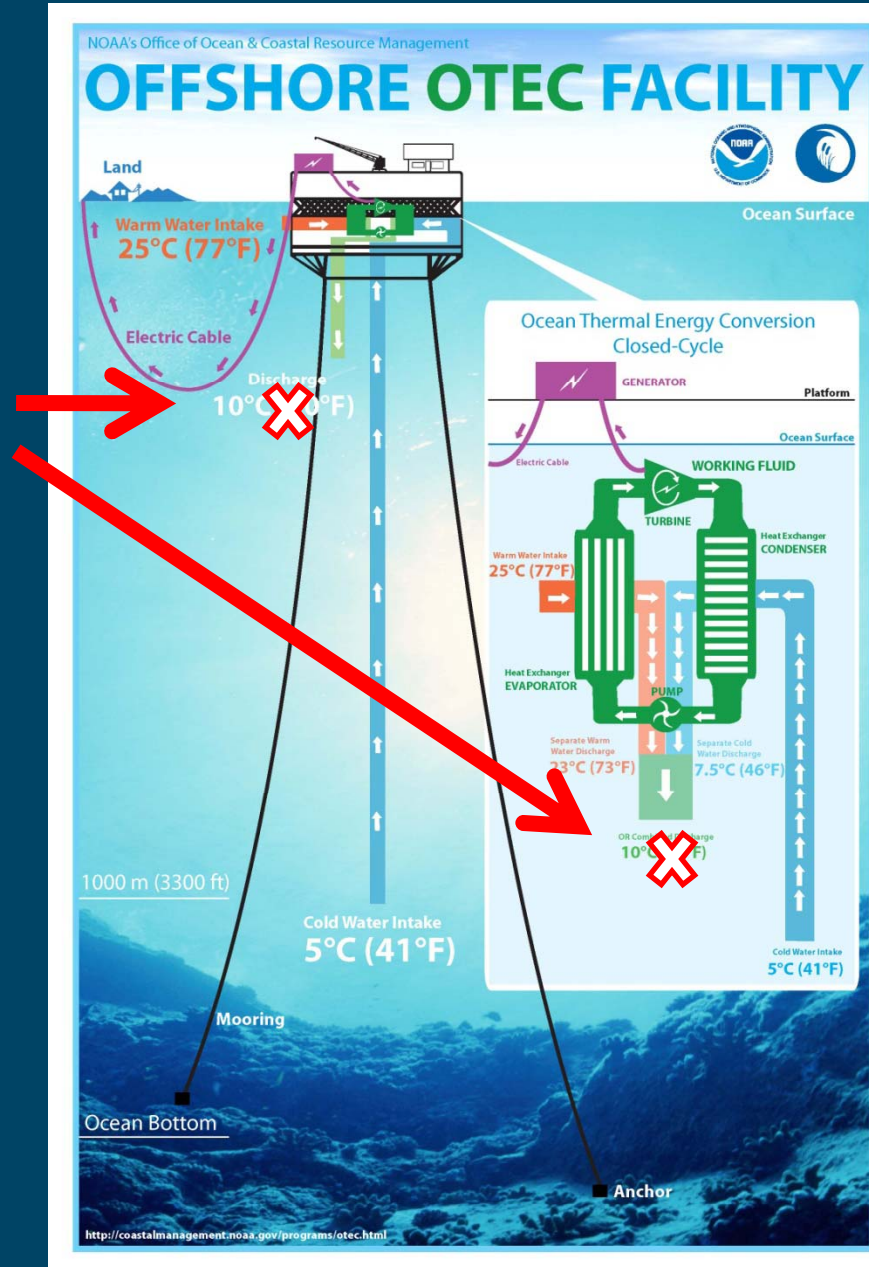
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# Workshop Logistics and CRRC Overview



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16° C (61° F)

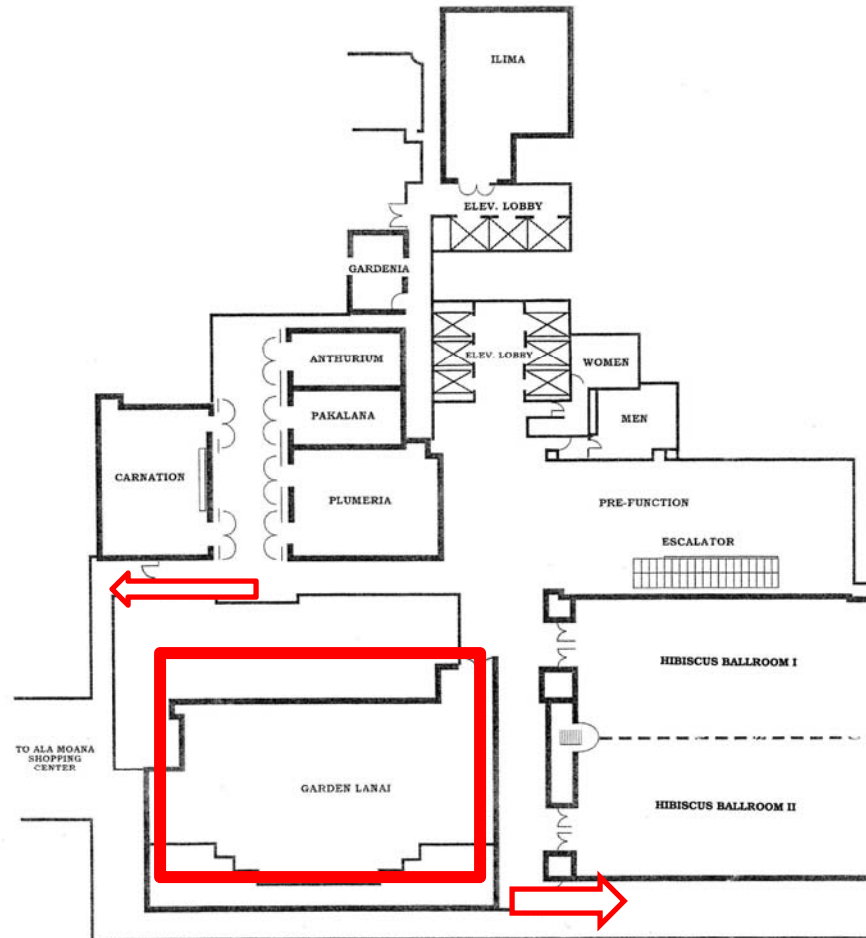


# LOGISTICS

- **Fire Exits**
- Restrooms
- Location of breakout rooms
- Parking
- Dining – breakfasts, lunches (Tuesday and Wednesday) & snacks
- Evening Dinner Tuesday Night:
  - Location: The Willow's Restaurant (walking is an option; directions on registration desk)
  - Cash bar available - 6:30 pm
  - Buffet Dinner
- Evening Dinner Wednesday Night - On Your Own
- If you have any questions - check with staff at registration table



## MEETING ROOM FLOOR PLANS



ALA MOANA HOTEL \* 410 ATKINSON DRIVE \* HONOLULU, HI 96814  
808.944.4333 \* FAX 808.944.6837 (rev. 10)



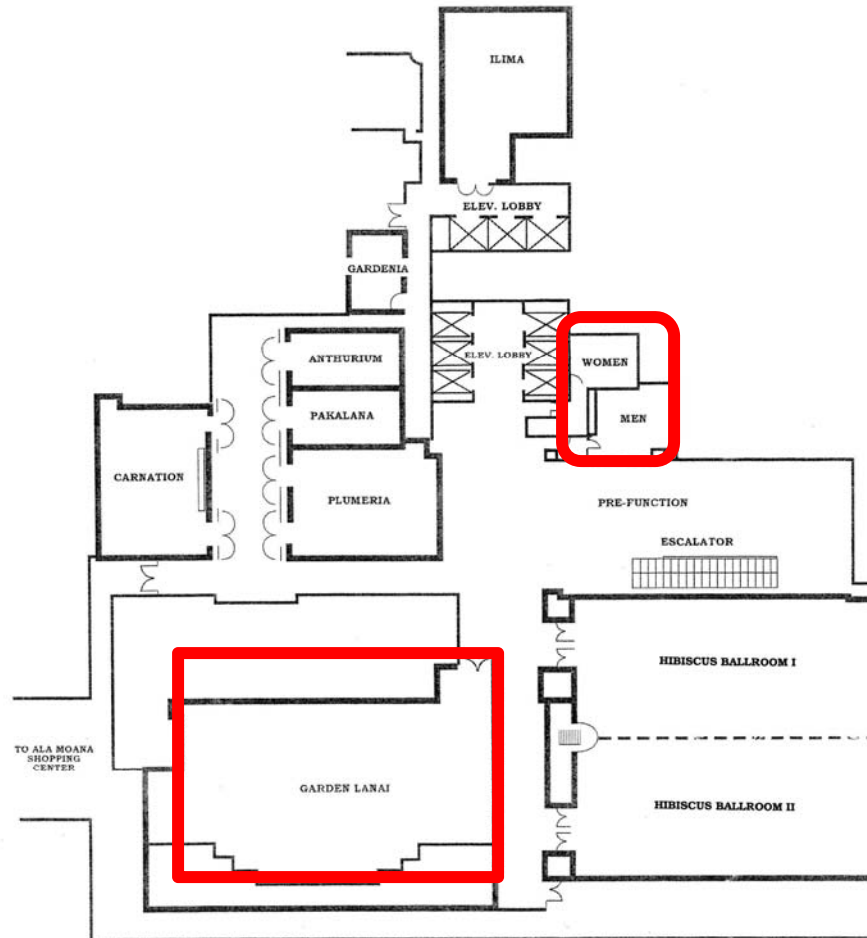
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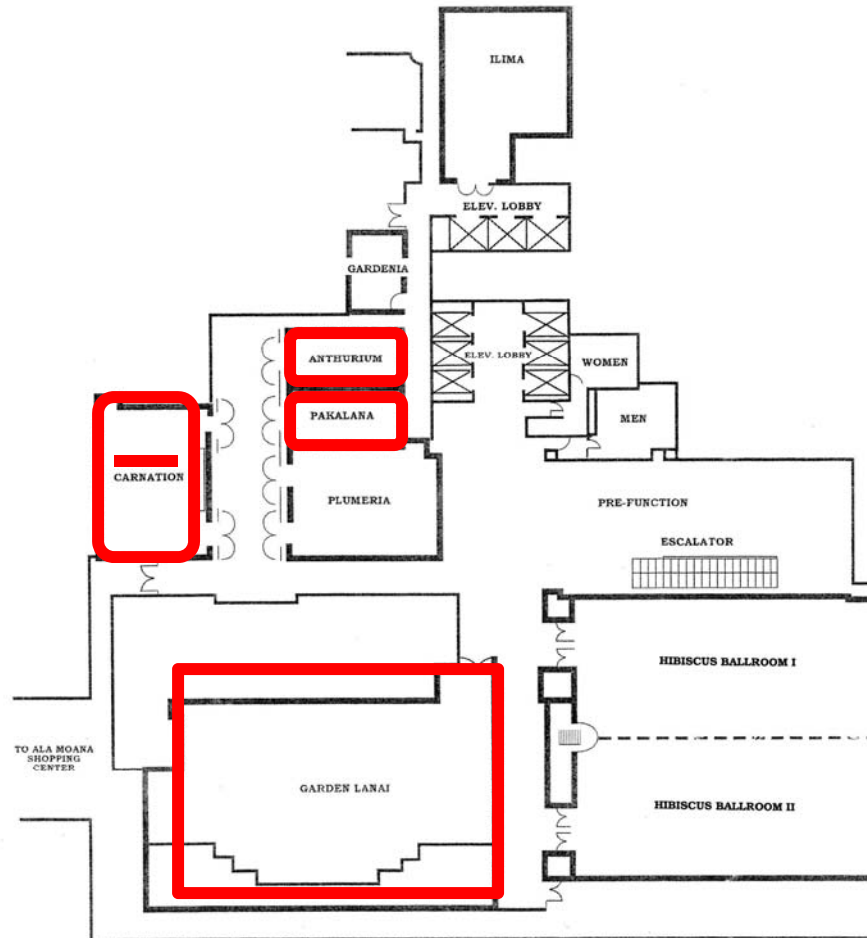


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- Parking: See Kathy for validation
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# KEY CRRC STAFF

- Nancy Kinner - UNH Co-Director
- Joe Cunningham - Group Lead / Research Engineer II
- Zach Magdol - Group Lead / Research Engineer I
- Kathy Mandsager - Program Coordinator
- Heather Ballesterio - Graduate Student/Recorder
- Mike Curry - Graduate Student/Recorder
- Adria Fichter - Graduate Student/Recorder
- Nate Little- Graduate Student/Recorder
- Chris Wood- Graduate Student/Recorder



# CRRC OVERVIEW



Coastal Response Research Center

# CRRC CREATION

- NOAA's Office of Response and Restoration (ORR)/UNH spill partnership in 2004
- Co-Directors:
  - UNH - Nancy Kinner
  - NOAA - Amy Merten



# OVERALL MISSION

- Develop new approaches to response and restoration through research/synthesis of information
- Serve as a resource/hub for NOAA, NOS (National Ocean Service) and other agencies
- Transform research results into practice
- Educate students who will pursue careers in response and restoration



# OUTREACH EFFORTS

- 21 workshops on hot topics to identify research priorities and partners (Examples Below)
  - Dispersed Oil: Efficacy and Effects
  - Submerged Oil: State of the Practice
  - Human Dimensions of Spills
  - Integrated Modeling
  - PAH Toxicity
  - Environmental Response Data Standards
  - Opening the Arctic Seas: Envisioning Disasters & Framing Solutions
  - NRDA in Arctic Waters: The Dialogue Begins
  - Dispersant Use in Deepwater Horizon Spill
- **OTEC Technical Readiness**





# Coastal Response Research Center Website

[www.crrc.unh.edu](http://www.crrc.unh.edu)



# Workshop Background, Objectives and Outcomes



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# BACKGROUND FOR TODAY'S MEETING

- NOAA's Office of Ocean and Coastal Resource Management (OCRM) licensing of OTEC
- David Kennedy, recent OCRM Director, on CRRC Advisory Board
- OCRM Senior Policy Analyst David Kaiser affiliated with CRRC at UNH
- CRRC experience hosting workshops



# CRRC/OCRM Partnership

- CRRC hosting two OTEC workshops for OCRM
  - November 2009: Technical Aspects
  - June 2010: Assessing Potential Physical, Chemical and Biological Impacts
- Format: Plenary Sessions and Breakout Groups
- Participants representing a spectrum of industry, public sector, academia, and NGOs



# KEY CONCEPT

- Bring diverse expertise and perspectives to the table
- Dialogue on:
  - Where we are?
  - Where do we want to be?
  - How do we get there?



# PLANNING COMMITTEE

Whitney Blanchard, NOAA OCRM

Eugene Bromley, USEPA

Alan Everson, NOAA, NMFS

Helen Farr, NOAA, OCRM

Kerry Kehoe, NOAA, OCRM

Nancy Kinner, UNH, CRRC

Don MacDonald, NOAA

Scott Medeiros, USCG

Doug Miller, USCG

Michael Parke, NOAA

Mike Reed, US DoE

Dwight Trueblood, NOAA, CICEET

Alison Hammer & Stephanie Kavanaugh, NOAA (Facilitators)



# MEETING PURPOSE

- One of several forums on OTEC
- Gather information for NOAA and DOE
  - Help meet their OTEC licensing and permitting responsibilities
- Ensure development of commercial scale OTEC facility is environmentally acceptable prior to licensing



# MEETING OBJECTIVES

- Identify potential physical, chemical and biological impacts of OTEC
- Identify baseline and monitoring data needed to evaluate impacts of operating OTEC
- Identify research needs if they exist
- Determine how OTEC designs can be adjusted to avoid, minimize, mitigate impacts
  - Without endangering functional viability





# ASSUMPTIONS

- First likely OTEC facility:
  - Closed cycle
  - Offshore
  - Floating & moored
  - Producing electricity transmitted to shore via submarine cable



# Definitions for this Workshop

- Small OTEC Facility = 5-10 MWe
- Large OTEC Facility = 100 MWe
- Operational Efficiency =  
$$\frac{\text{Net Power Output}}{\text{Max Potential Design Energy Output}}$$



# MEETING STRUCTURE

- Plenary Session Talks - Today AM
  - Retrospective
  - System Overview
  - Plume Modeling
  - Site Assessments
  - Potential Physical, Chemical, and Biological Impacts (General & Hawaiian)
- Breakout Sessions I, II, III, IV and Report Outs
- Synthesis/Next Steps



# BREAKOUT SESSIONS I, II, III

- Groups:
  - Warm Water Intake
  - Cold Water Intake
  - Discharge (including biocides & working fluid)
  - Physical Presence, Construction, Accidents, Emergency Response
  - Noise and Electromagnetic Fields



# BREAKOUT SESSION QUESTIONS

- Breakout Session I
  - What possible impacts are missing from our list?
  - What are the best available technologies to assess OTEC impacts and risks?
  - What baseline assessments, monitoring strategies and modeling methods are needed to develop quantifiable levels of impact and risk for OTEC facilities?



# BREAKOUT SESSION QUESTIONS

- Breakout Session II
  - What is the geographic extent of the population/community to which impacts should be related (e.g., Pacific Ocean [whales], U.S. waters surrounding Hawaii [phytoplankton], waters around Oahu, or waters between Barbers Point and Diamond Head)?
  - What additional research is needed in order to assess potential biological impacts of OTEC facilities?



# BREAKOUT SESSION QUESTIONS

- Breakout Session III
  - How can potential physical, chemical and biological impacts be avoided, minimized or mitigated within the operational and design parameters of an OTEC system?
  - What are potential tradeoffs between physical, chemical and biological impacts and operational efficiency?



# BREAKOUT SESSION IV

- New Groups:
  - Oceanography
  - Plankton
  - Fisheries
  - Mammals/Turtles/Birds





# BREAKOUT SESSION IV QUESTIONS

- Question
  - For your focus topic, determine baseline, monitoring, and modeling data needed for understanding the potential environmental impacts associated with an OTEC facility.
  - Identify what further research is needed.
  - Assign (High, Low, or Medium) priority to each data need and note why this level of priority is being assigned.



# BREAKOUT SESSION IV

- Group 5: Regulatory
- Question:
  - Based on what was discussed on Days 1 & 2, what else may be needed above and beyond baseline assessment, monitoring strategies, and modeling methods to assess the biological impacts of an OTEC facility?



# BREAKOUT SESSION IV

- Group 6: Engineering
- Question:
  - Based on what was discussed previously (Days 1 & 2 of workshop), how might the OTEC facility design be adjusted to avoid, minimize or mitigate physical, chemical and biological impacts without compromising the operational viability of an OTEC facility?



# MEETING OUTCOMES

- CRRC will prepare a workshop report
  - Posted on CRRC website
  - Electronic version to all participants
- Enable NOAA to make better informed decisions in developing OTEC commercial license requirements
- Assist DOE in developing permitting requirements for OTEC demonstration facilities



# MEETING REPORT

- Report contents include:
  - Introduction and workshop history
  - Workshop organization and structure
  - Summary of breakout group reports
  - Research and development needs
  - Conclusions
  - Appendices:
    - Participant list
    - Breakout group questions
    - Recorders notes from breakout sessions
    - Group report out presentations
    - Plenary slide presentations



# QUESTIONS?



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# PARTICIPANT INTRODUCTIONS

- Name
- Affiliation
- Expertise

