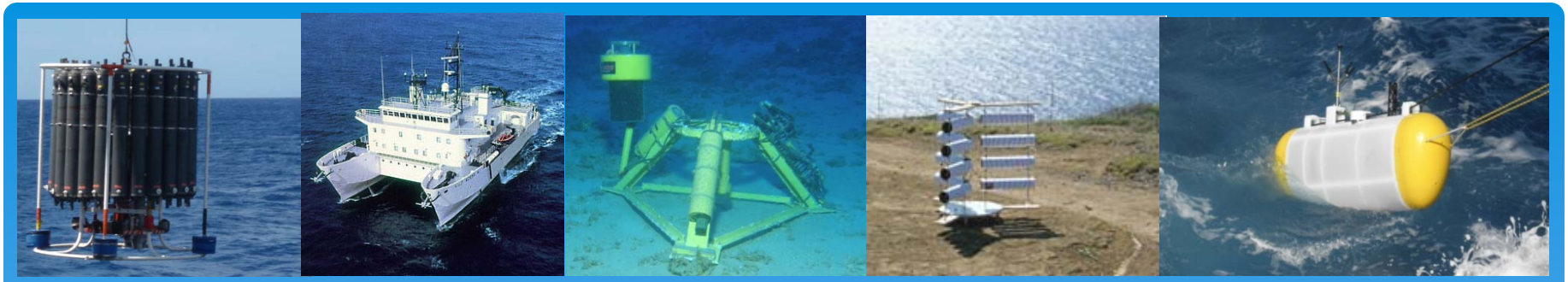

Observing ocean changes at the nation's first SWAC system

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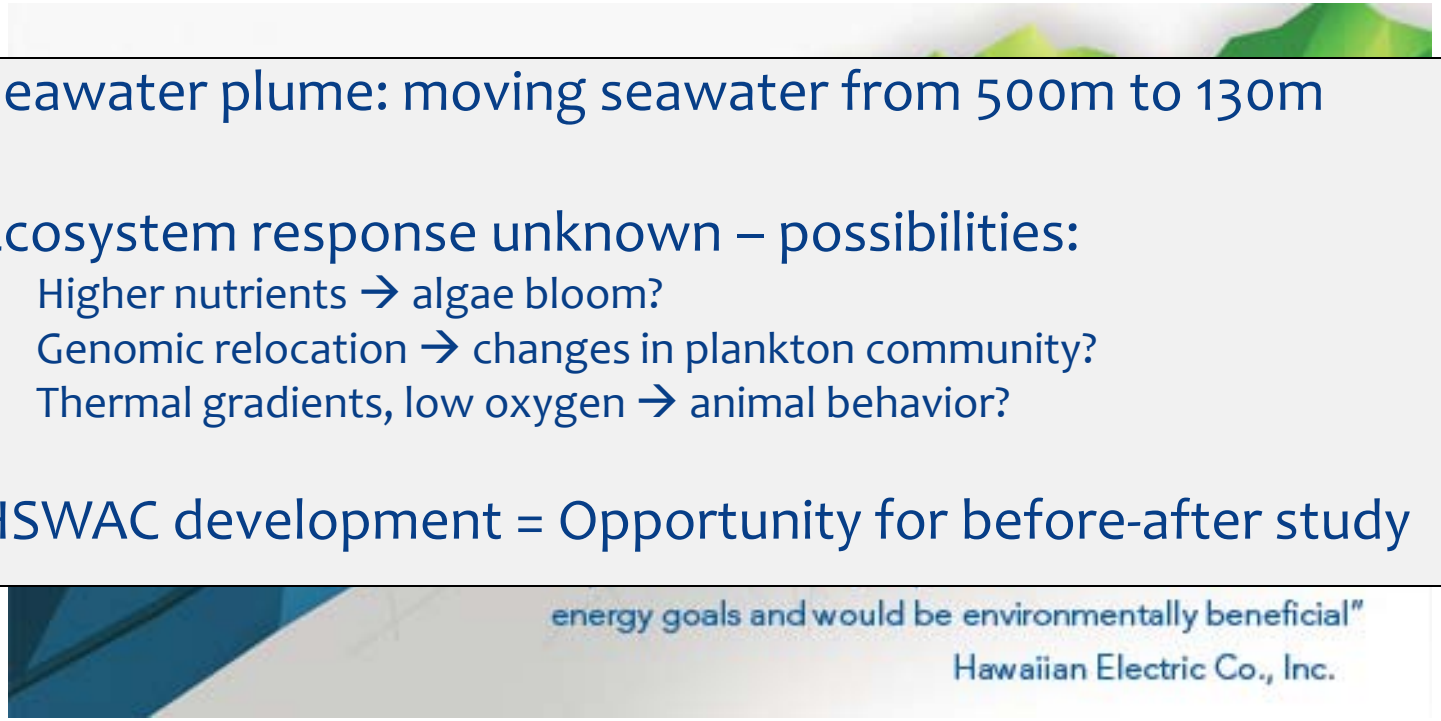
SWAC Introduction

* Similar to OTEC – renewable energy
* Environmental changes or risks? Unique considerations

* Seawater plume: moving seawater from 500m to 130m

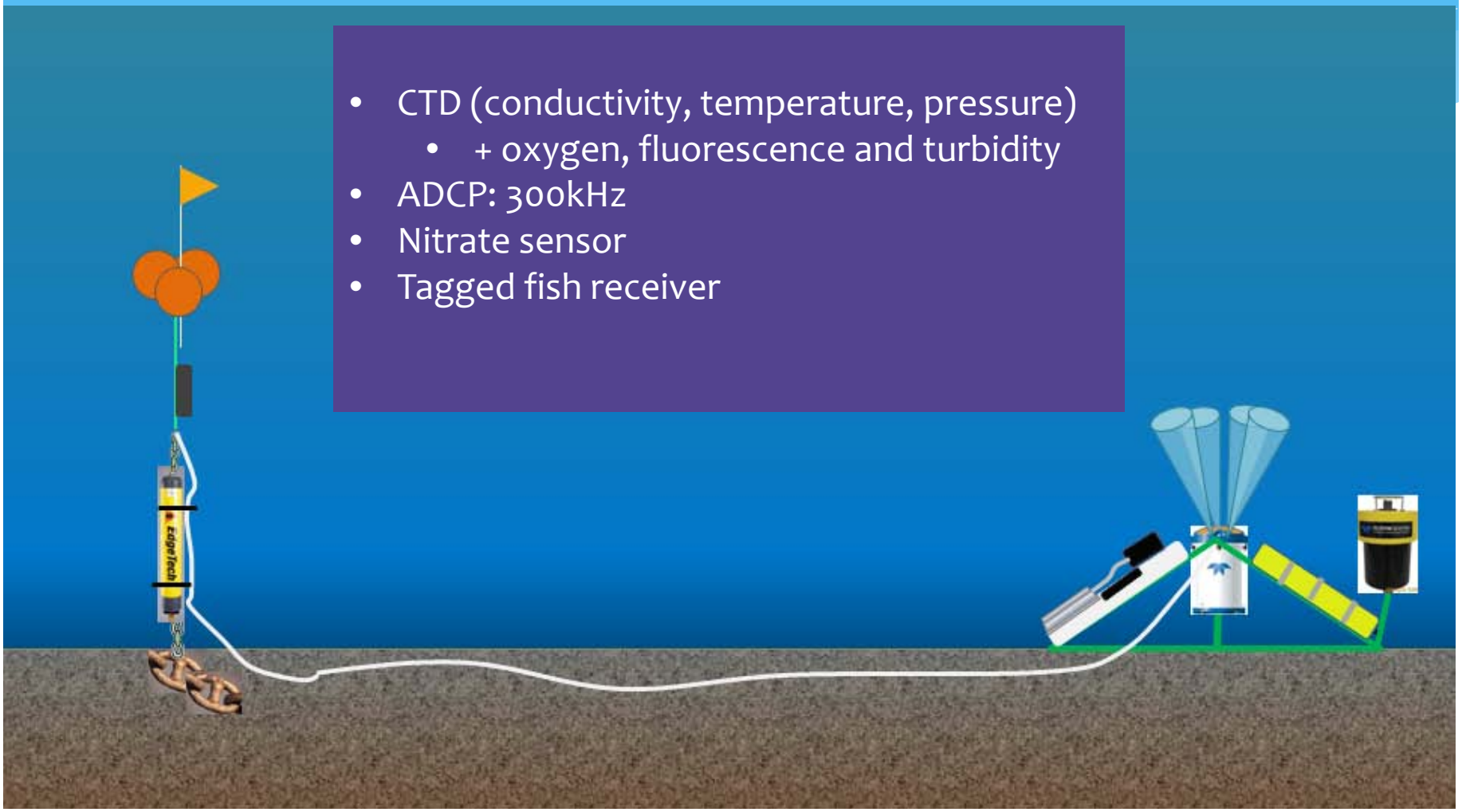
* Ecosystem response unknown – possibilities:
  * Higher nutrients → algae bloom?
  * Genomic relocation → changes in plankton community?
  * Thermal gradients, low oxygen → animal behavior?

* HSWAC development = Opportunity for before-after study



Monitoring: Bottom mooring

- CTD (conductivity, temperature, pressure)
  - + oxygen, fluorescence and turbidity
- ADCP: 300kHz
- Nitrate sensor
- Tagged fish receiver



Monitoring: CTD casts and water sampling

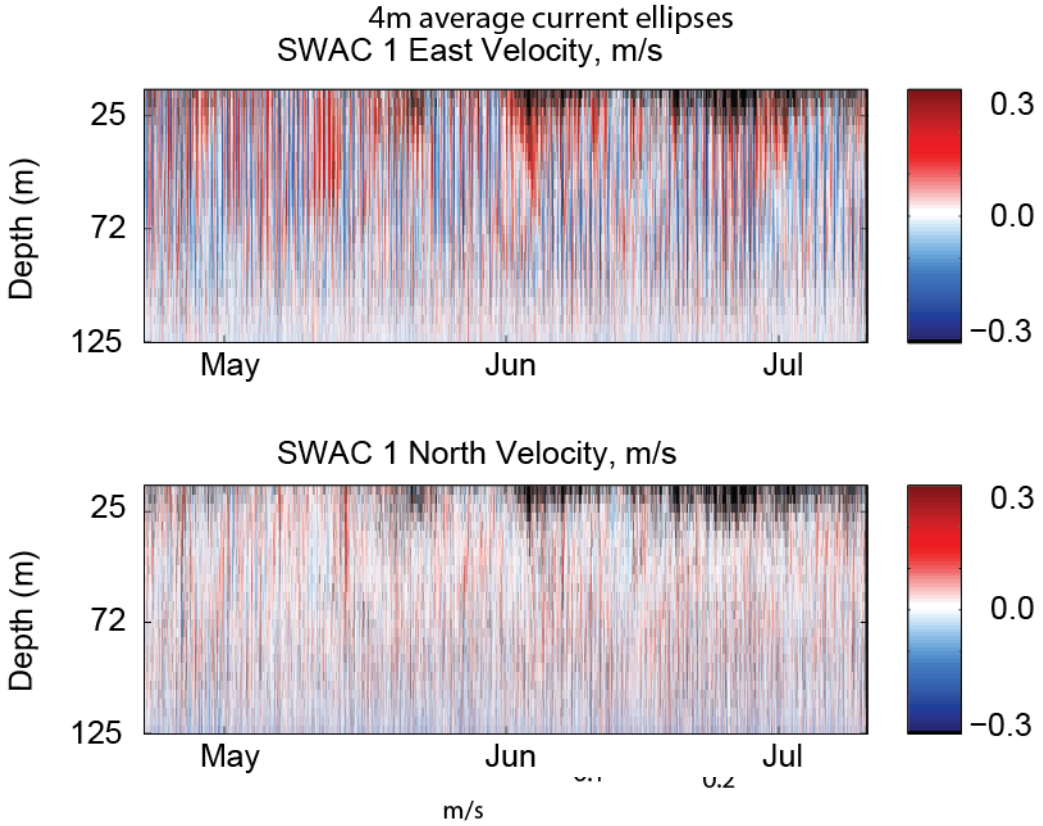
* Nutrients (N,P,Si)
* Chlorophyll a
* Microbes
* Dissolved gases
* Flow cytometry
* DIC

Monitoring: MMPs and PacIOOS

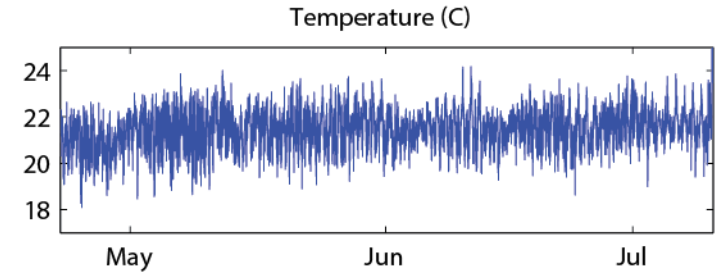
* A moving moored profiler collects baseline current and CTD data
* PacIOOS – Pacific Islands Ocean Observing System
  * Gliders make passes through the area
  * HF radar provides surface current data

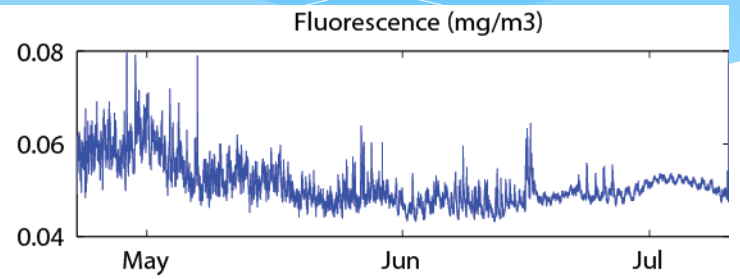
Preliminary results: Bottom mooring

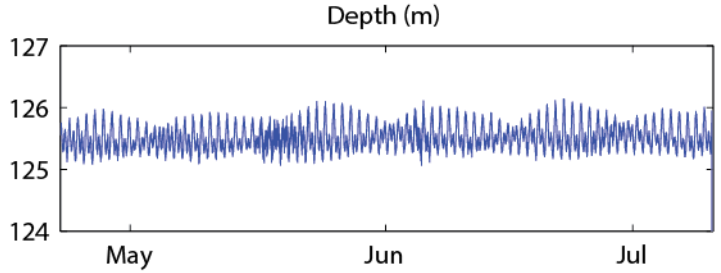
* ADCP reveals low current velocities near bottom
  * Typical along-isobath currents observed in midwater
  * Across-isobath currents observed near bottom

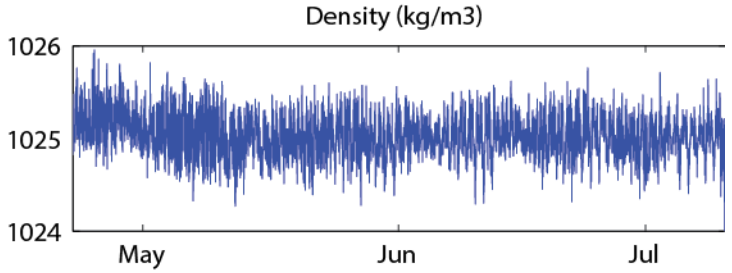


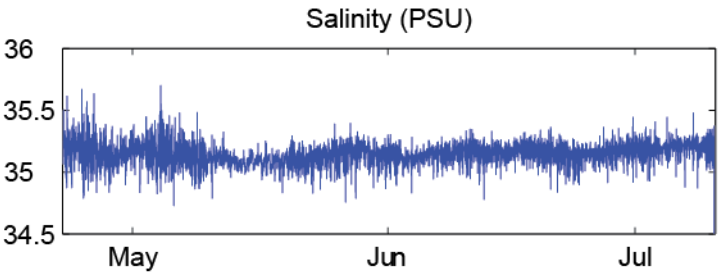
Preliminary results: Bottom Mooring





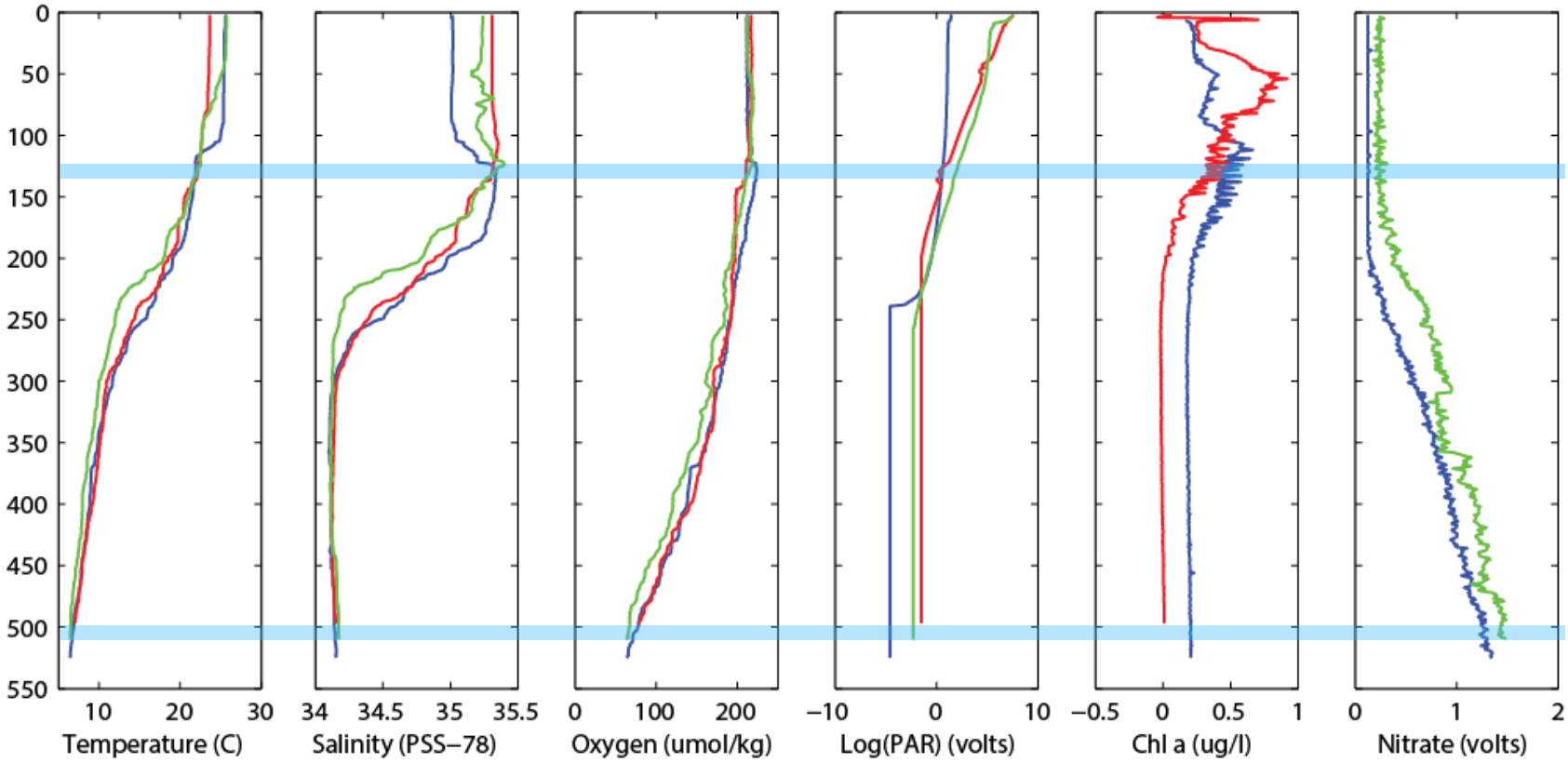






* Tidal shifts in temp, salinity, fluorescence.
* Water mass shift in early May?

Preliminary results: CTD Casts



Items of note and path forward

* Cross-shore currents at site
  * Capable of advecting plume upslope?
  * Bring nutrients into well-lit water?
  * Density of plume vs. current field
* "Before-After" experimental design
  * ~1-1.5 years baseline
  * 1-2 years operational

Mahalo!

Questions?

Photo: Christopher Pala, www.onewater.org

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