

CANON Fall Experiment

Draft questions and plans

Science Questions/Objectives

- What are the source waters and seed populations for phytoplankton blooms in and out of Monterey Bay?
- What are the processes responsible for phytoplankton blooms or lack thereof in and outside of Monterey Bay?
- What are the biogeochemical consequences (particulate flux, nutrient regeneration) of phytoplankton blooms or lack thereof in and outside of Monterey Bay?

Technical questions/objectives

- Can we identify and trace source water and seed populations for phytoplankton blooms in and out of Monterey Bay?
- Can we develop environmental indices that can be used to predict the location and timing of blooms with enough accuracy and speed to be used to trigger autonomous sampling?
- Can we develop an information processing and display system that can be used in real time to improve decision making and publication preparation in delayed mode?

Specific objectives

- Determine nitrogen budget for coastal upwelling systems by measuring uptake, nitrification and sinking flux
- Deploy LSTs, drifting productivity arrays and follow over time
- Track LSTs with LRAUV – Daphne and measure conditions above LST continuously
- Follow LSTs with Flyer measuring biological activity repeatedly using pump profiling system

LST tracks

Specific objectives

- Determine triggers for harmful algal blooms of Pseudo-Nitzschia (PN)
- Follow PN with ESPs, ships
- Acquire high resolution profiles of PN with pump profiling system
- Develop proxies for PN that can be measured by gliders, AUVs
- Map flow and the position of fronts in near real time using AUVs, gliders, drifters, HF, models
- Acquire real time information from Dorado using wave glider hotspot
- Integrate information to trigger adaptive sampling with ESPs

Specific objectives

- Integrate inshore PN work with offshore nitrogen budgets to determine “crosstalk”

Timeline

- Now – prep for experiment, instruments/ vehicles, information flow, samples, ODSS, etc.
- Weeks of September 3 and 9 – Continue above, deploy ESPs, AUVs, gliders, drifters
- Week of September 16 – Carson
- Sept 20-27 – Flyer
- Sept 30 – Oct 3 – Carson
- October 7 recover ESPs

Ships

- Western Flyer – PCTD, UCTD, profiling pump, optics
- Rachel Carson - PCTD, UCTD, profiling pump, optics
- Paragon – LST, Glider, drifter support – how is this managed?
- Martin – ECOHAB, PCTD, UCTD, optics

AUVs

- Dorado
- Tethys
- Daphne
- U of Porto ?
- Other ?

Gliders

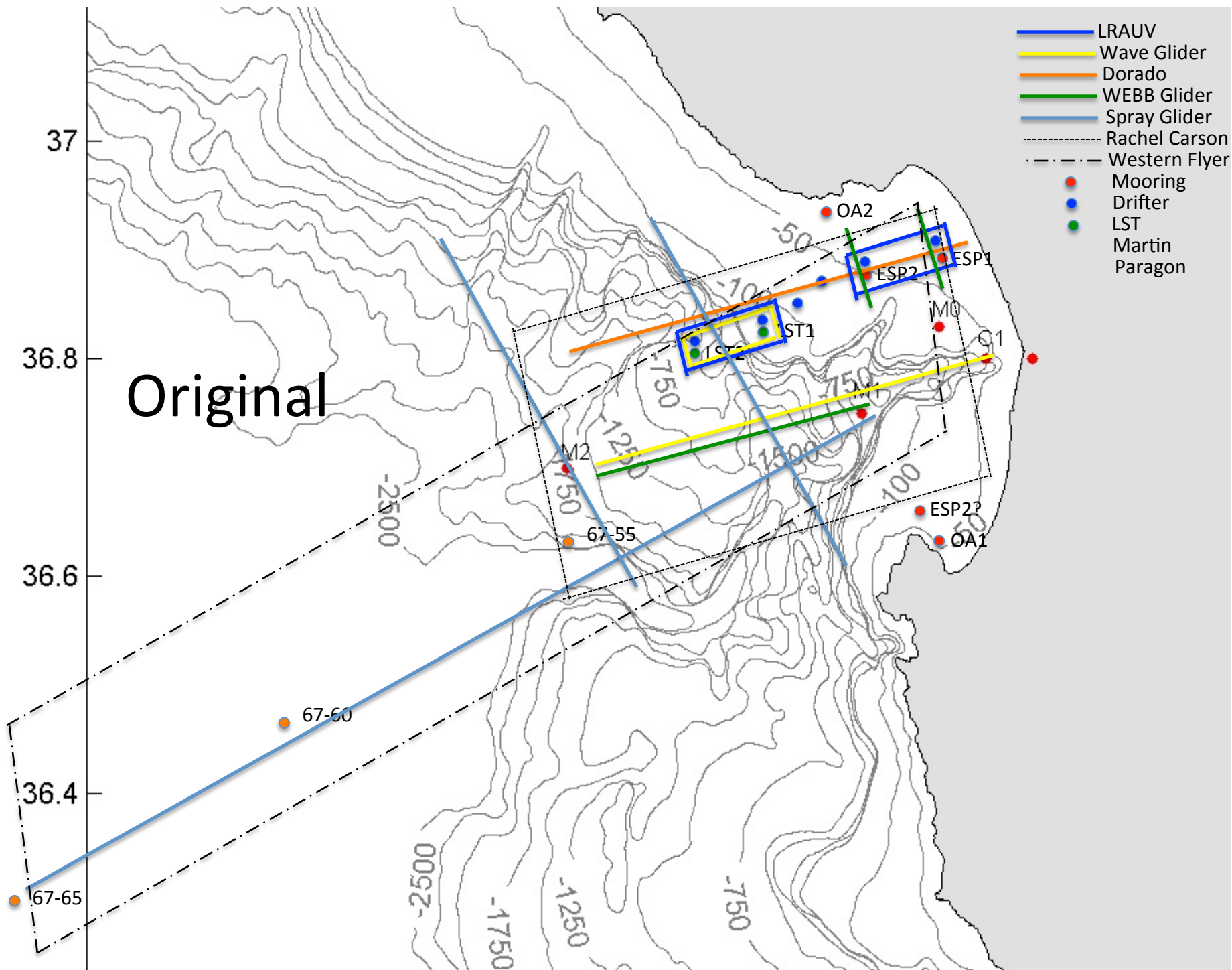
- Spray Line 67
- Spray NPS
- Spray NPS
- Slocum Teledyne
- Slocum UCSC
- Slocum UCSC
- WG OA
- WG Tex

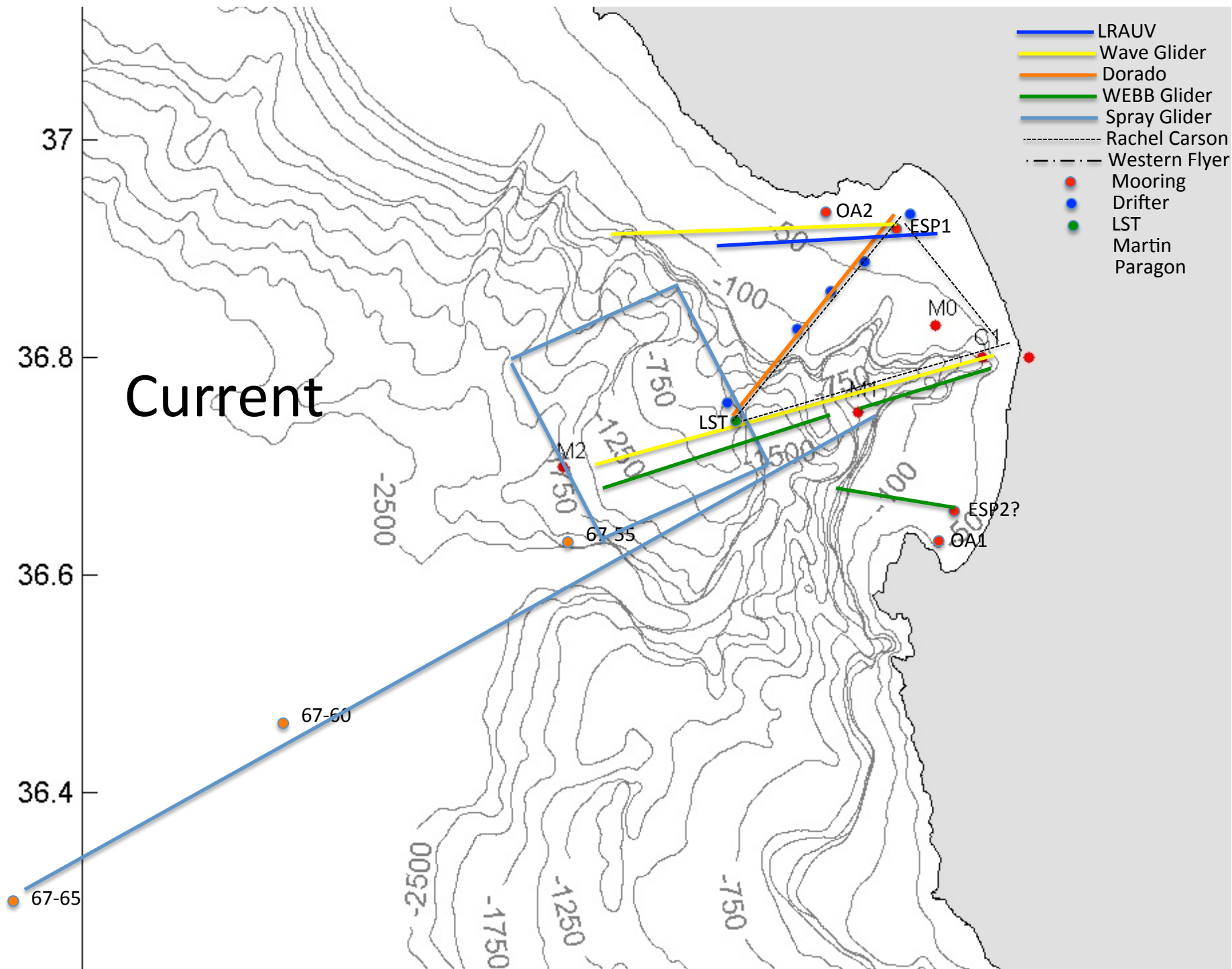
Moorings

- M1
- M2H
- OA1
- OA2
- ESP 1
- ESP 2
- Other ?

LST, drifter, other

- LST (= Lagrangian sediment trap) 1
- LST 2
- Stella 1-n (what is n?)
- Android 1-n
- Floats ?
- ROMS-NPZD 3 km
- Remote sensing (standard, Hyspiri, drone?)
- Cowen zoo system ?
- Flocam?
- ADCPs?
- Geostrophy?





Issues

- Paragon scheduling
- Gulper samples
- Information management
- Equipment on Carson/Flyer
- Processing steps for loading CTD data, etc.
- Other?

Working groups and leads (members in parentheses)

- Science planning – Ryan (Bellingham, Chavez, Scholin, etc.)
- Logistics – Maughan (Edgington, Rajan, Chavez, etc.) - timeline
- Autonomous mobile platforms – Bellingham (Wahl, Ryan, Zhang etc.) – can/should we use Dorado in between Carson cruises
- Autonomous drifting platforms – Smith (Sherman, Chavez, Wahl, etc.) – what are the issues with LSTs
- Data analysis – Messie (Ryan, McCann, Bellingham, Chavez, etc.) – standard products, user interfaces, models, etc.
- Samples – Pennington (Blum, Smith³, Kudela, Preston, Zhang, etc.) – inventory, gaps, etc.
- Data management – Gomes/Michisaki – what is it?
- Responsibility of lead to develop a list (questions, platforms, products, data, samples), a means to answer/produce/distribute, analysis, organize team, etc.

Preparatory analysis

- Remote sensing, models, in situ data from September and domain