



# OOI Data for Undergraduate Laboratory Exercises

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## Introduction

- Cal Poly Humboldt is an undergraduate California State University located along the northern California coast on Humboldt Bay (HB). The R/V *Coral Sea* (RVCS) is our 28-m, ocean-going research vessel used for research and educational cruises.
- CeNCOOS is the regional Ocean Observing (OO) node, which provides real-time marine conditions.
- The goal of this poster is to combine the observational and remote sensing platform data sets that enable students to recognize marine biogeochemical signals and the seasonal, decadal and climatological noise.

## Data Sources and Access

- Real time observation CeNCOOS, NWS, CDIP
- Phytoplankton sampling CDPH
- Alkalinity HOCO
- Sediment (riverine) input (wet storms) USGS
- Sediment resuspension (dry storms)

## R/V Coral Sea



## Laboratory Use

### Current

- CDPH phytoplankton monitoring
- PaCOOS Trinidad Line sampling
- HOCO pH monitoring

### Lab exercises

- Compare phyto sampling to CeNCOOS data sets
- Observe T, S, pH, Chlorophyll, etc.
- Impact of rainfall, down/upwelling, thermodynamics

### Future

- Phytoplankton ID lab (other coastal piers)
- Other?

## Student skills

- What skill sets would improve the student aptitude for working in the field?
- What do the programs need from undergraduate and graduate students?
- How do we implement the goals?

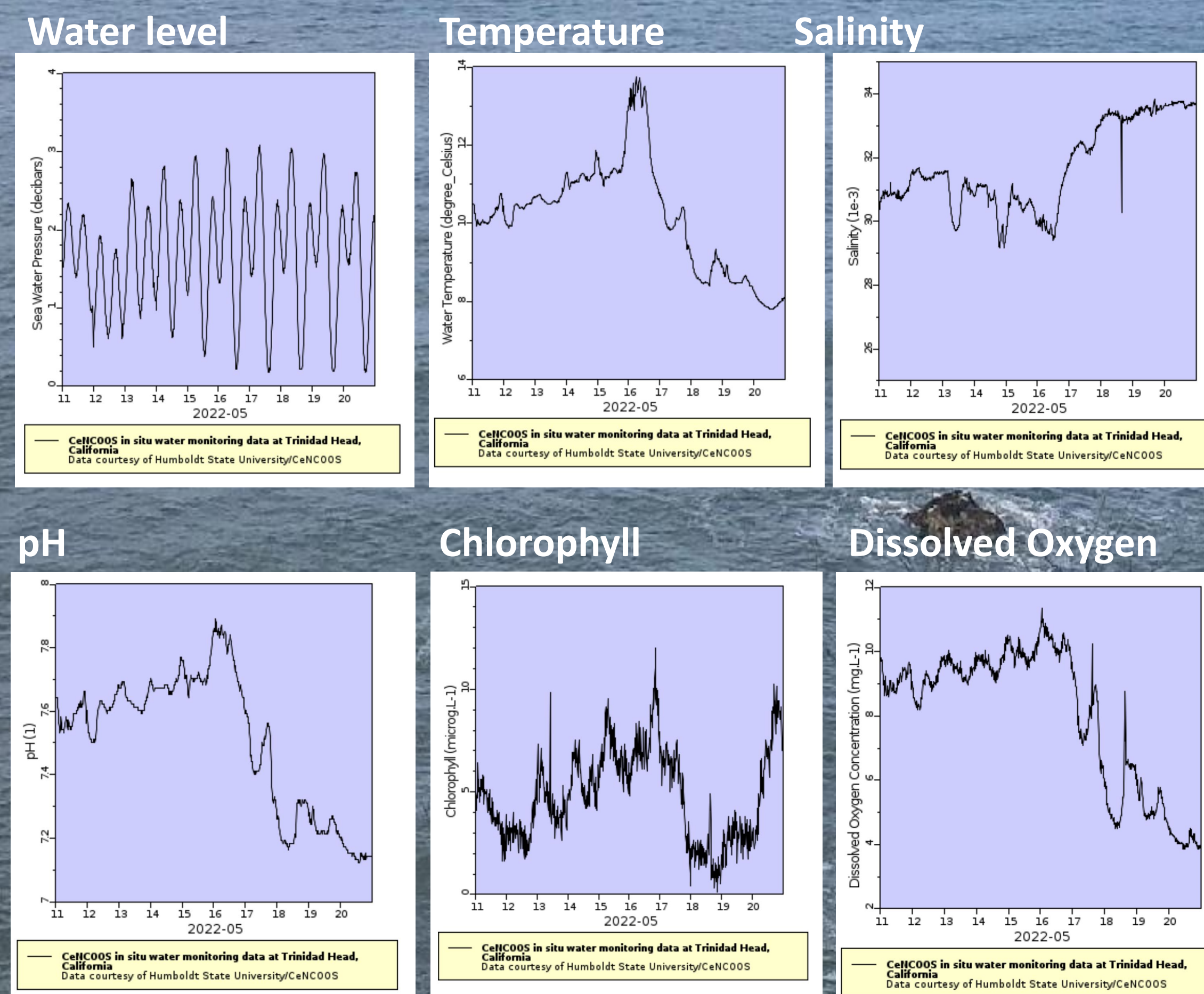
## Courses

OO and RV data sets are used in several Ocean courses across the spectrum from 1<sup>st</sup> year Introductory courses, to 4<sup>th</sup> year Capstone courses.

- First year student teams are assigned a SCCOOS, CeNCOOS or NANOOS shore stations to learn how to access, and extract Temperature (T), Salinity (S) and chlorophyll (chl) data over several weeks.
  - Teams plot the data to generate basic time series graphs in Excel to:
    - compare how parameters change temporally over the period of study
    - compare how these parameters differ between sites in different locations along our coast.
  - These data are summarized as written and as graphical reports.
- Upper division students generate time-series T, S, chl, Turbidity, pH and dissolved oxygen (DO) data to compare weekly, monthly and annually trends between the HB and Trinidad pier (Tr) station data
  - Students compare measurements taken at the same time from HB and Trinidad shore stations. They generate hypotheses about why we might see differences/similarities in hydrographic parameters between these two sites
- RVCS cruise data (i.e., CTD, Secchi disk, plankton tow) measurements look for any inconsistencies might be observed when comparing field and OOI data
  - comparing to with flood, ebb, and slack water levels to characterize ocean versus bay water.
  - student generated hypotheses to predict how ocean (Tr) & bay (HB) waters have those qualities and how seasonal changes affect the data.

## Example 1

Upwelling event started May 18-21, 2022  
Trinidad Pier Observations

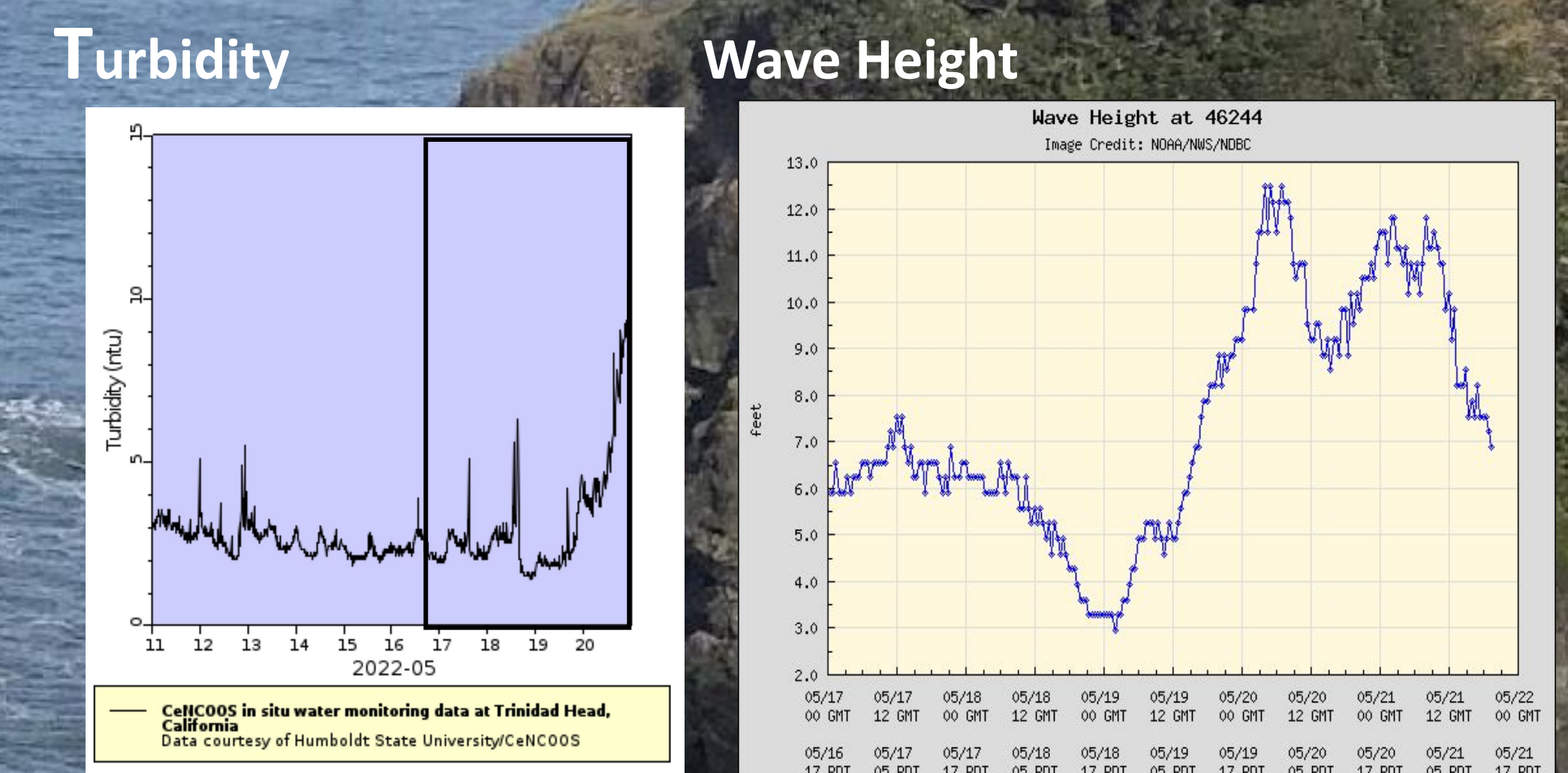


### Example 1 Questions

- Do you see an obvious signal that correlates with the tidal data?
- What parameters can be used to defining up/downwelling?
- How does upwelling affect the pH? Why does this occur?
- Based on the chlorophyll, how would you predict the pH and dissolved oxygen would respond?
- Do the plankton species observed (from physical samples) affect these parameters?

## Example 2

Sediment resuspension event May 19-21, 2022 CeNCOOS and NDBC and Trinidad Observations



### Example 2 Questions

- Do you see a correlation between wave height and turbidity data?
- What effect does this have on the water quality?
- How would this affect productivity?
- What effect would you expect to the sediments at the seafloor?

## Acknowledgements

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