

**OC4610 - WAVE AND SURF PREDICTION
LAB #6 - Monterey Bay Wave Studies**

March 18, 2004

I. INTRODUCTION

In this lab students will examine wave data collected between the deployment and recovery cruises of March 9, 12 aboard the R/V Pt Sur. Students will examine data collected at four of the six sites occupied during the deployment (Fig. 1). There was an instrument failure at site 4 so no data are available at that site. The goals of this lab are to; 1) Examine the spatial and temporal variability of the wave field during the deployment and 2) Compare the observed wave field at these sites with the CDIP prediction data for these sites during the deployment.

II. DATA

For this experiment we collected data from different types of sensors at several sites around Monterey Bay. For the purposes of this lab we will not differentiate between the different sensor types. The basic wave parameters (H_s , T_p , and D_p) have been calculated for each of the sites and are available to the students in matlab “.mat” files. These files can be accessed through the course web site (www.oc.nps.navy.mil/wavelab/courses.html). Each of these files can be loaded directly into matlab and contain the basic wave parameters for the specified site. The variables contained in these files are: tme_X , hs_X , Tp_X , and Dp_X , where X is the site number (1,2,3a,4,5, or 6). tme_X is the time in matlab datenum format, hs_X is the significant wave height, Tp_X is the peak period, and Dp_X is the mean direction at the peak period.

In addition to the data collected by our instruments it will be necessary for the students to access the CDIP wave prediction data for each of the sites. These files are named: **site1_pred.dat**, **site2_pred.dat**, **site3_pred.dat**, **site4_pred.dat**, **site5_pred.dat**, and **site6_pred.dat**. Each contains the hourly predicted wave characteristics, spectra and directional moments for the specified site.

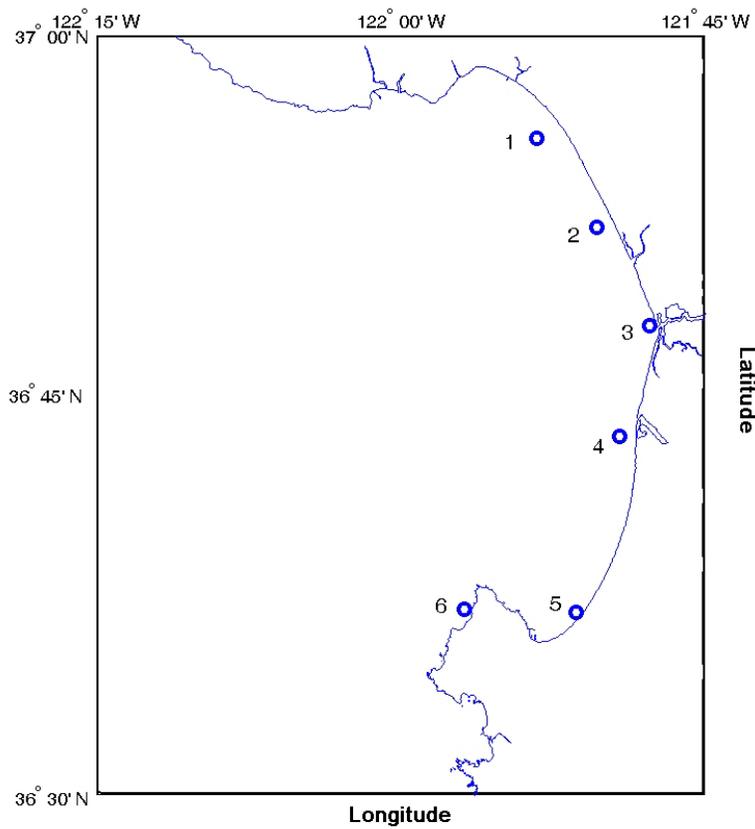


Figure 1 – Sites occupied during the OC4610 class cruises of 9, 12 March 2004.

Table 1 – Summary of data collected during the OC4610 cruises of 9,12 March 2004 onboard the R/V Pt. Sur.

Site	1	2	3a	3b	4	5	6
Instrument	Vector #1188	Aquadopp #636	Vector #628	Triton #R56	Aquadopp #669	3D-Wave #1681	3D-Wave #1670
Starting Time	3/9:1000	3/9:1100	3/9:1100	3/9:1200	-	3/9:1300	3/9:1400
Ending Time	3/10:2300	3/10:2200	3/12:0800	3/12:0800	-	3/12:1300	3/12:1200

III. LAB GOALS/REQUIREMENTS

Specific tasks to be completed for each of the goals outlined in the Introduction are described below.

1) Examine spatial and temporal variability of the wave field.

- A) Create a plot of time vs. Hs, Tp, and Dp, for sites 1, 2, 3a, 5, and 6. Put all of the significant wave height (Hs) data on one panel, all of the peak period (Tp) data on another, etc.
- B) Describe the results. How does the peak direction change with the orientation of the coastline? Do the significant wave height and peak period vary from site to site? If so why?

2) Compare the observed wave field at one of the available sites with the CDIP prediction data.

- A) Create a plot of time vs. significant wave height (Hs), Peak Period (Tp), and Peak Direction (Dp) for the predicted and observed waves.
- B) For the above comparisons describe the results. Does the agreement between predicted and observed data change significantly during the course of the deployment? If so, does the change seem to be related to any specific wave characteristic?

IV. PROCEDURES/TECHNIQUES

To get started:

- 1) Start a matlab session and change to your working directory
- 2) Execute the matlab command: **addpath /h/oc5/jessen/oc4610/mfiles.**

3) Load the matlab “*.mat” files that contains the basic wave parameters for the sites at which data was collected.

4) Use the matlab function “load_predictions.m” to load the prediction data from the different sites. The command is used as follows:

[tme,hs,pp,pd,fr,en]=load_predictions(file,tof);

The function returns the time (in matlab datenum format), the significant wave height (hs), peak period (pp), peak direction (pd), frequency (fr), and energy density (en) predictions read from the file (file). "tof" is an optional time offset (hours) that will be added to the time in the prediction file to convert from UTC (default) to local time. The value for tof that you should use is -8.