Salinity Processes in the Upper-ocean Regional Studies (SPURS): Pre-cruise environmental report

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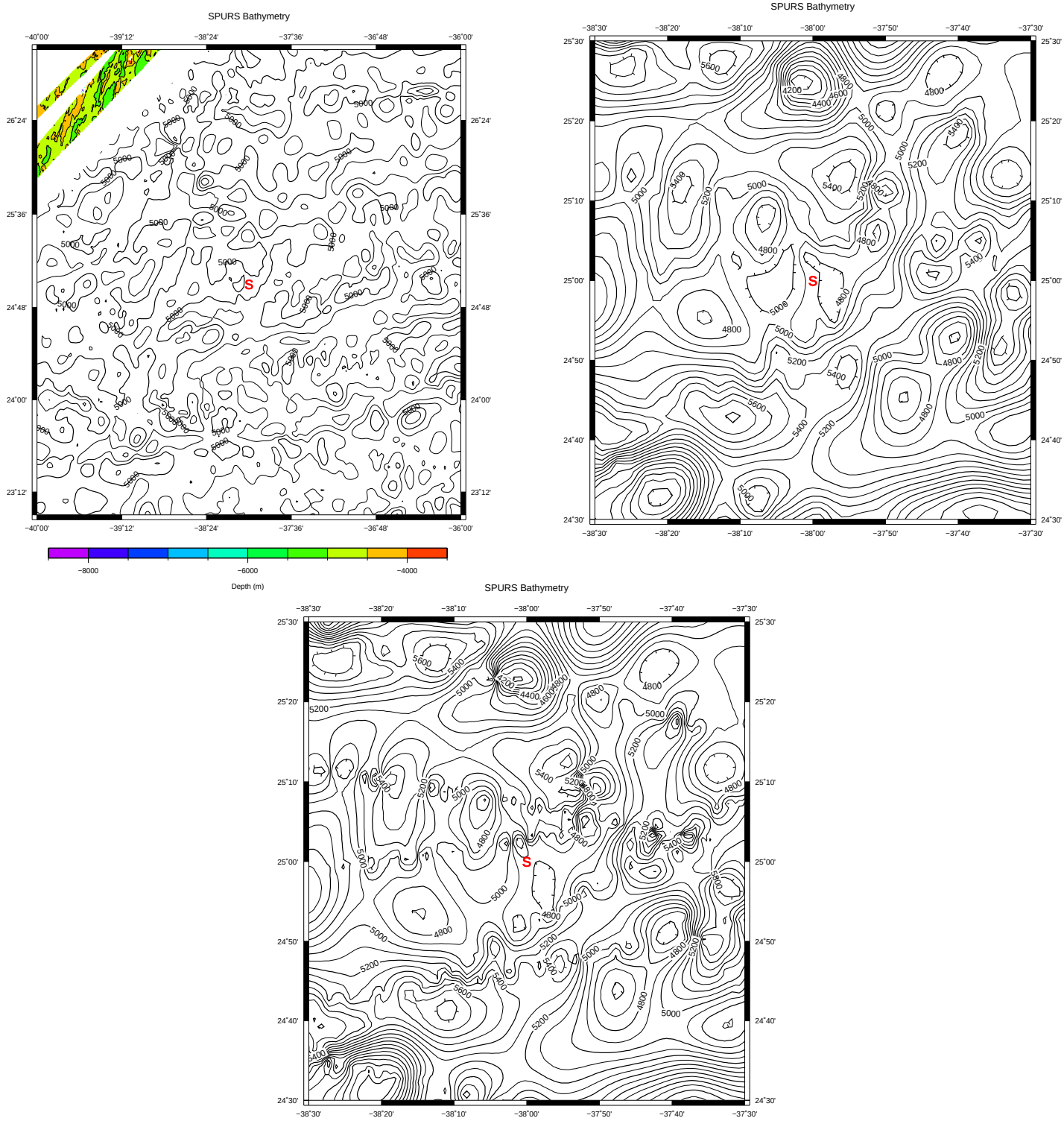
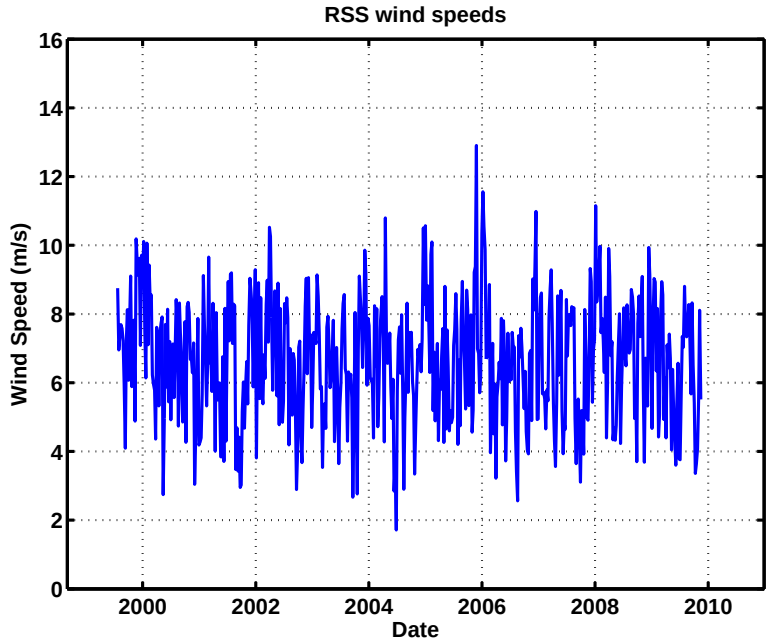
Bathymetry

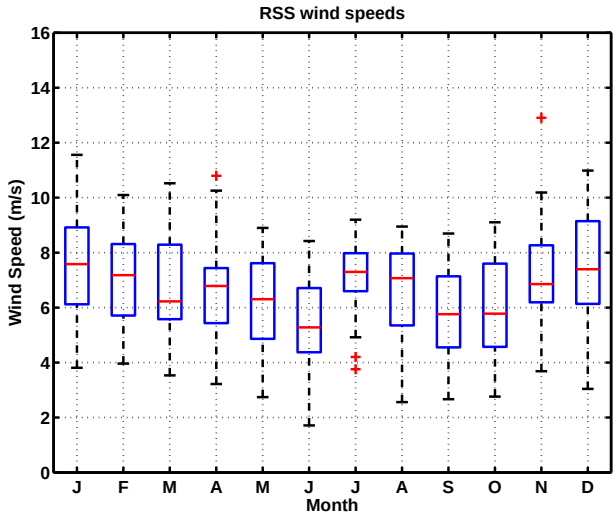
Data from Sea-Beam surveys within 2° of the proposed SPURS site were found on NOAA/NGDC website (`http://www.ngdc.noaa.gov/mgg/bathymetry/multibeam.html`), are shown in color on the figure. Contours from ETOPO-1 (1-arc-minute gridded data) are drawn where multi-beam data are not available. The proposed SPURS site (38°W; 25°N) is indicated by the red S (between 4800 and 4900 m depth). (a) 4-degree square around site; contours are drawn at 500 m intervals. (b) 1-degree square around site; contours are drawn at 100 m intervalsi and annotated at 200m intervals. (c) GEBCO 0.8 degree gridded data.

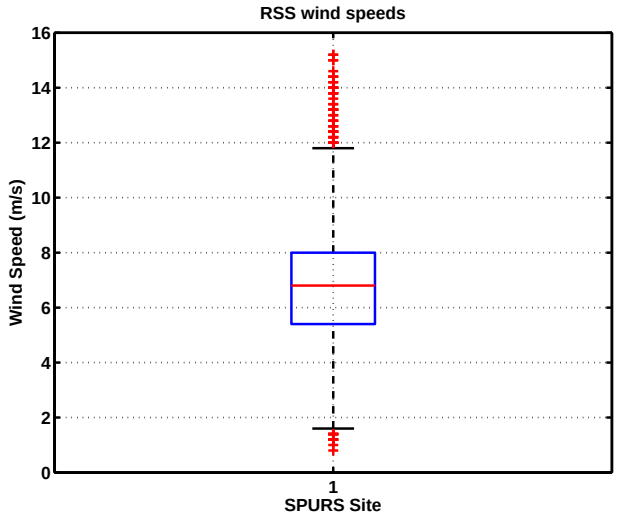


Wind Speed

QuikSCAT winds were obtained from Remote Sensing Systems (RSS) at `http://www.ssmi.com/data/qscat/bmaps_v04/y2009/m11/`



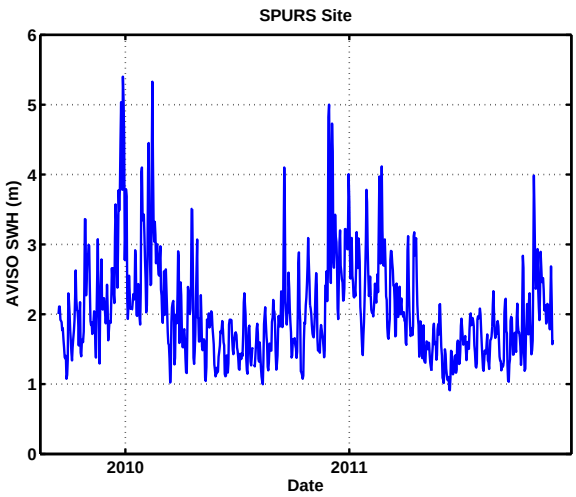


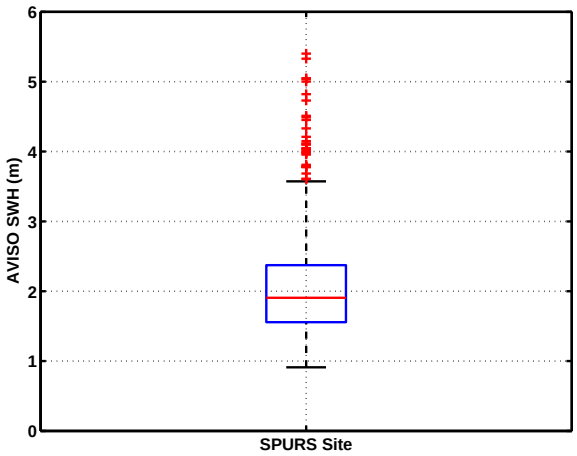


Wave Height

Significant wave height data from AVISO were found at `http://www.aviso.oceanobs.com/en/data/products/wind-waves-products/index.html` and were downloaded from `ftp://ftp.aviso.oceanobs.com/pub/oceano/AVISO/wind-wave/nrt/mswh/merged/`.

The waves data were extracted for the 1x1-degree square at the SPURS position (38°W; 25°N) and are shown in the Figures.





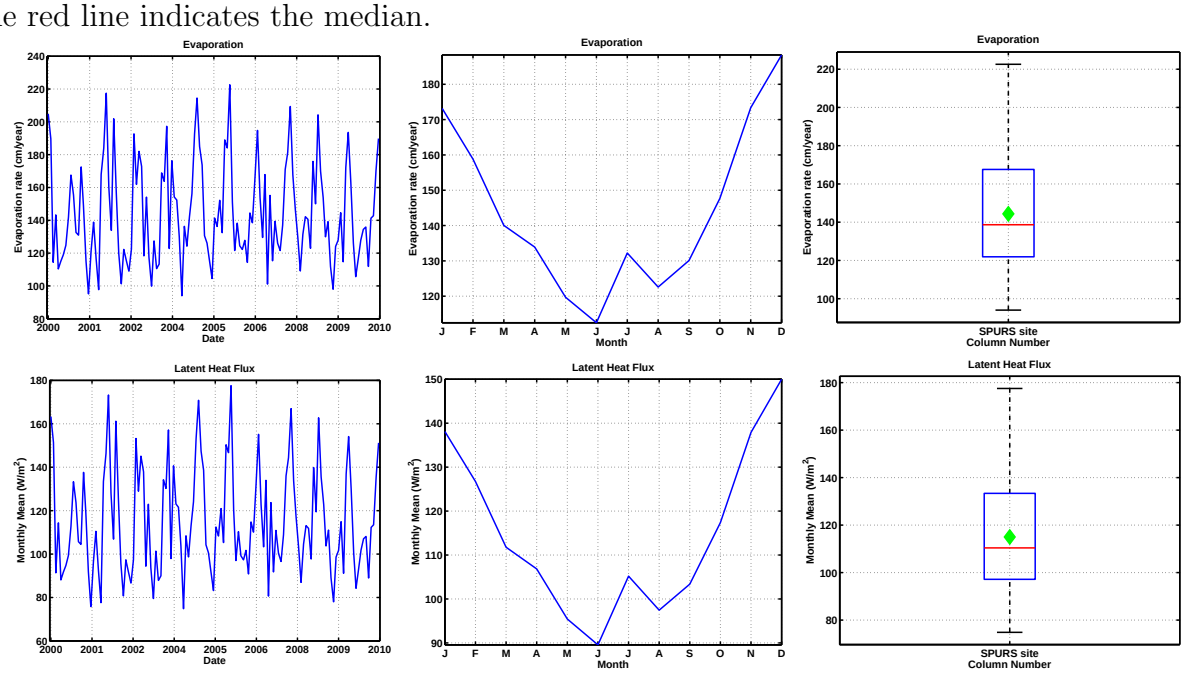
Flux

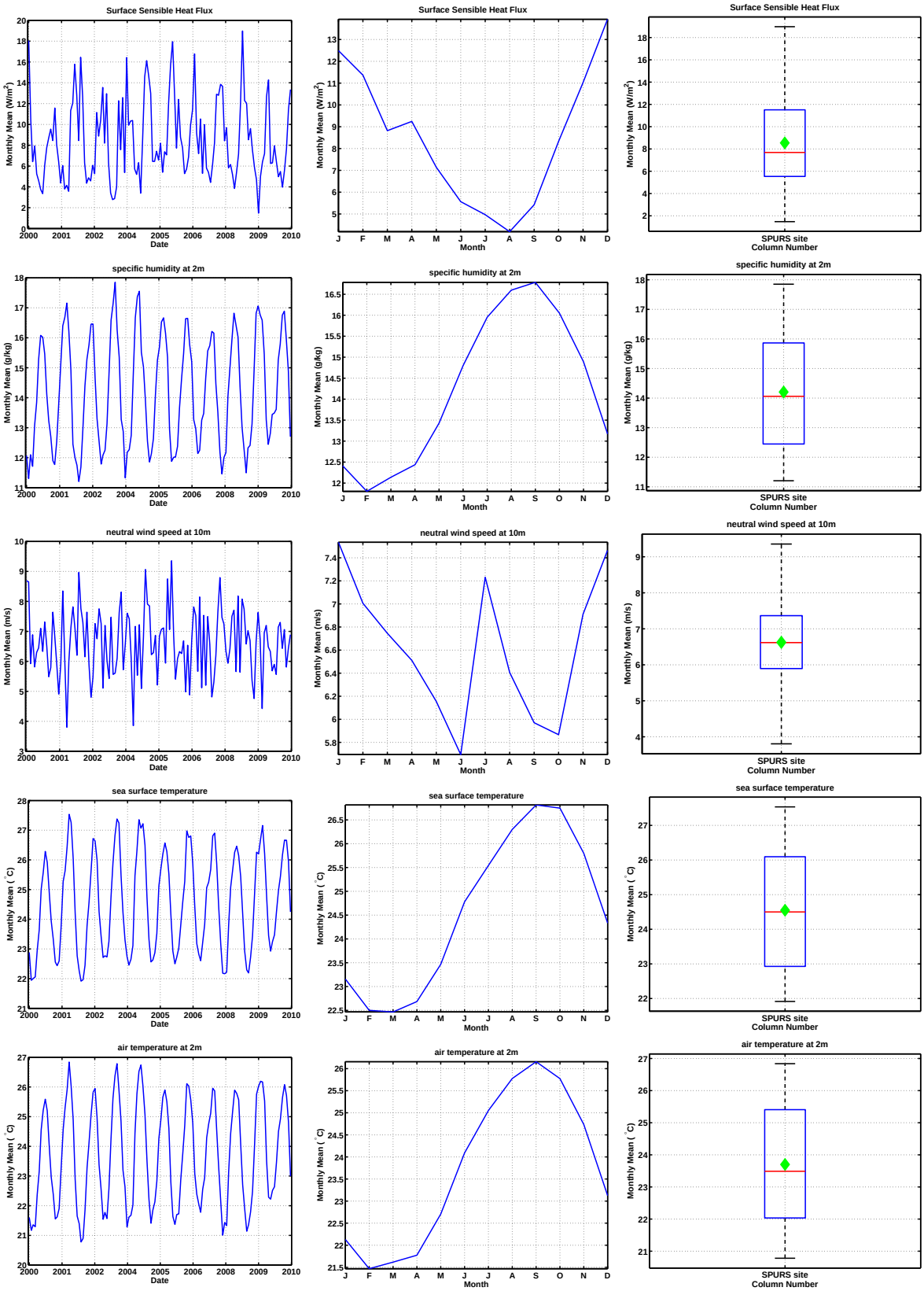
Product from the WHOI Objectively Analyzed Air-Sea Fluxes (OAFlux) Project was obtained `http://oaflux.whoi.edu` as NetCDF files consisting of monthly means of the following variables:

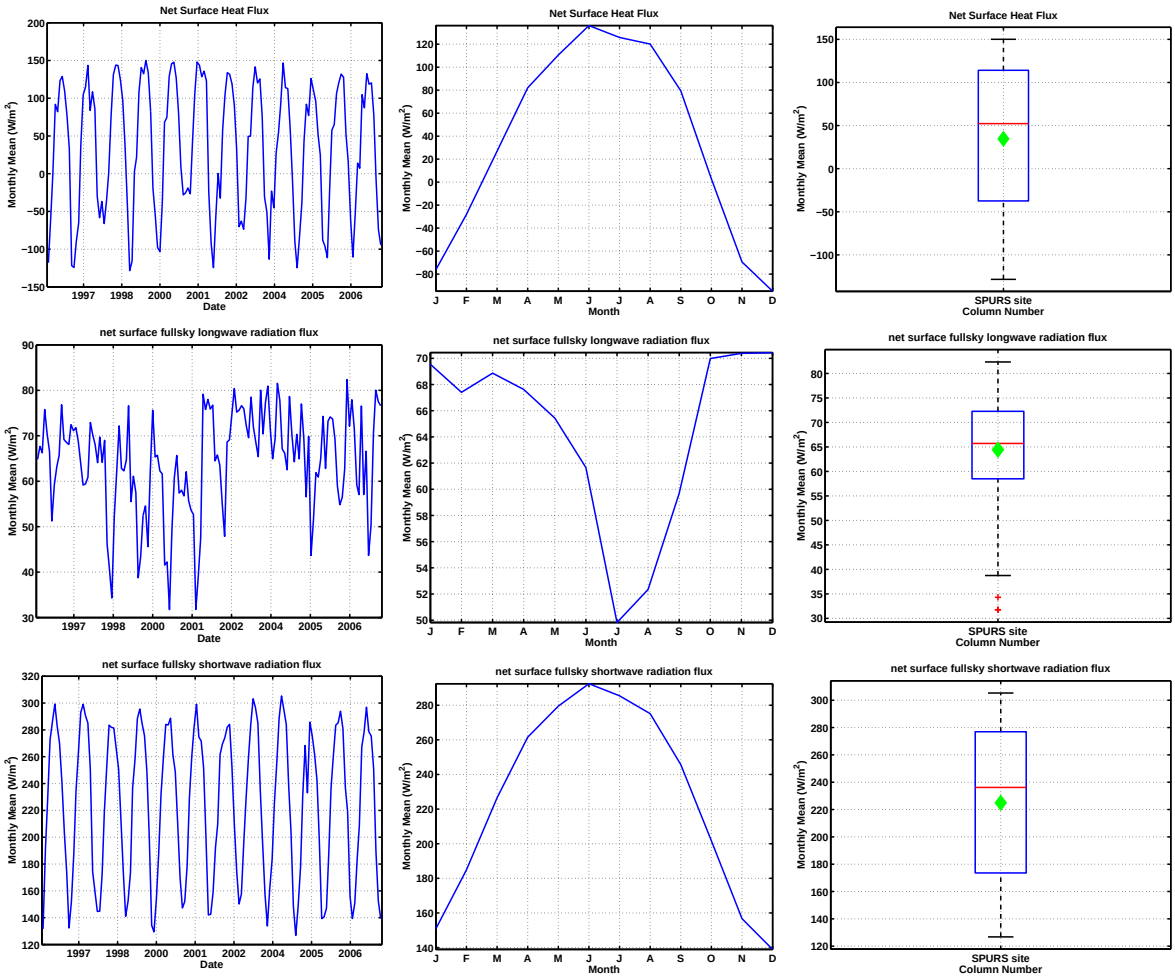
- Evaporation
- Latent Heat Flux
- Surface Sensible Heat Flux
- Specific Humidity at 2m
- Neutral Wind Speed at 10m
- Sea Surface Temperature
- Air Temperature at 2m
- Net Surface Heat Flux
- Net Surface Longwave Radiation Flux
- Net Surface Shortwave Radiation Flux

The first seven variables cover an eleven year period from 2000 to 2010, the last three (qnet, lwr and swr) are over a twelve year period from 1996 to 2007.

These are shown below in three figures, as a time series, a monthly mean, and a boxplot demonstrating ranges and location. The mean is plotted as a green diamond on the boxplot. The red line indicates the median.

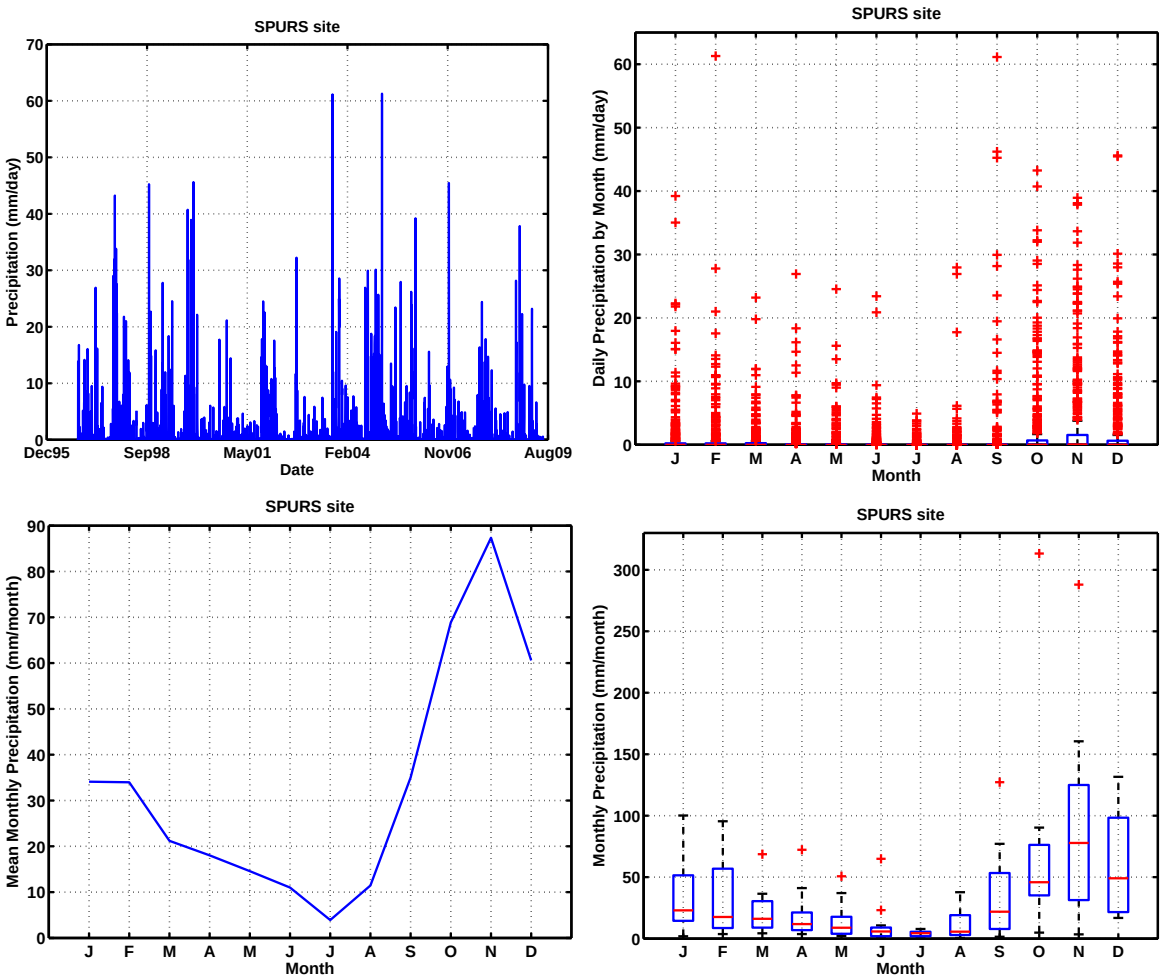


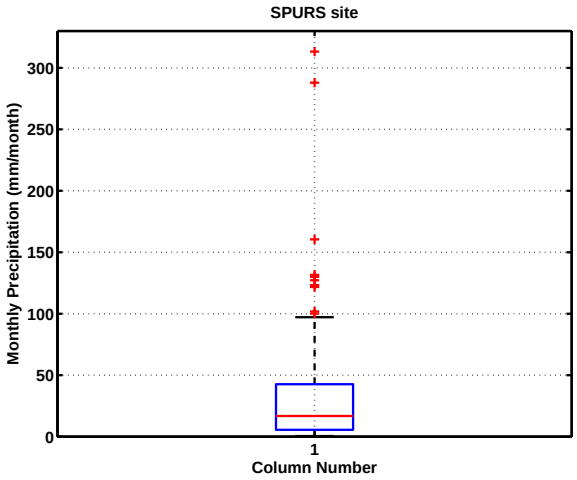

Surface Sensible Heat Flux
Monthly Mean (W/m^2)
Date
Month
SPURS site
Column Number
specific humidity at 2m
Monthly Mean (g/kg)
neutral wind speed at 10m
Monthly Mean (m/s)
sea surface temperature
Monthly Mean ($^\circ$C)
air temperature at 2m
J F M A M J J A S O N D
2000 2001 2002 2004 2005 2006 2008 2009 2010


Net Surface Heat Flux
Monthly Mean (W/m^2)
Date
Month
SPURS site
Column Number
net surface fullsky longwave radiation flux
net surface fullsky shortwave radiation flux
J F M A M J J A S O N D

Precipitation

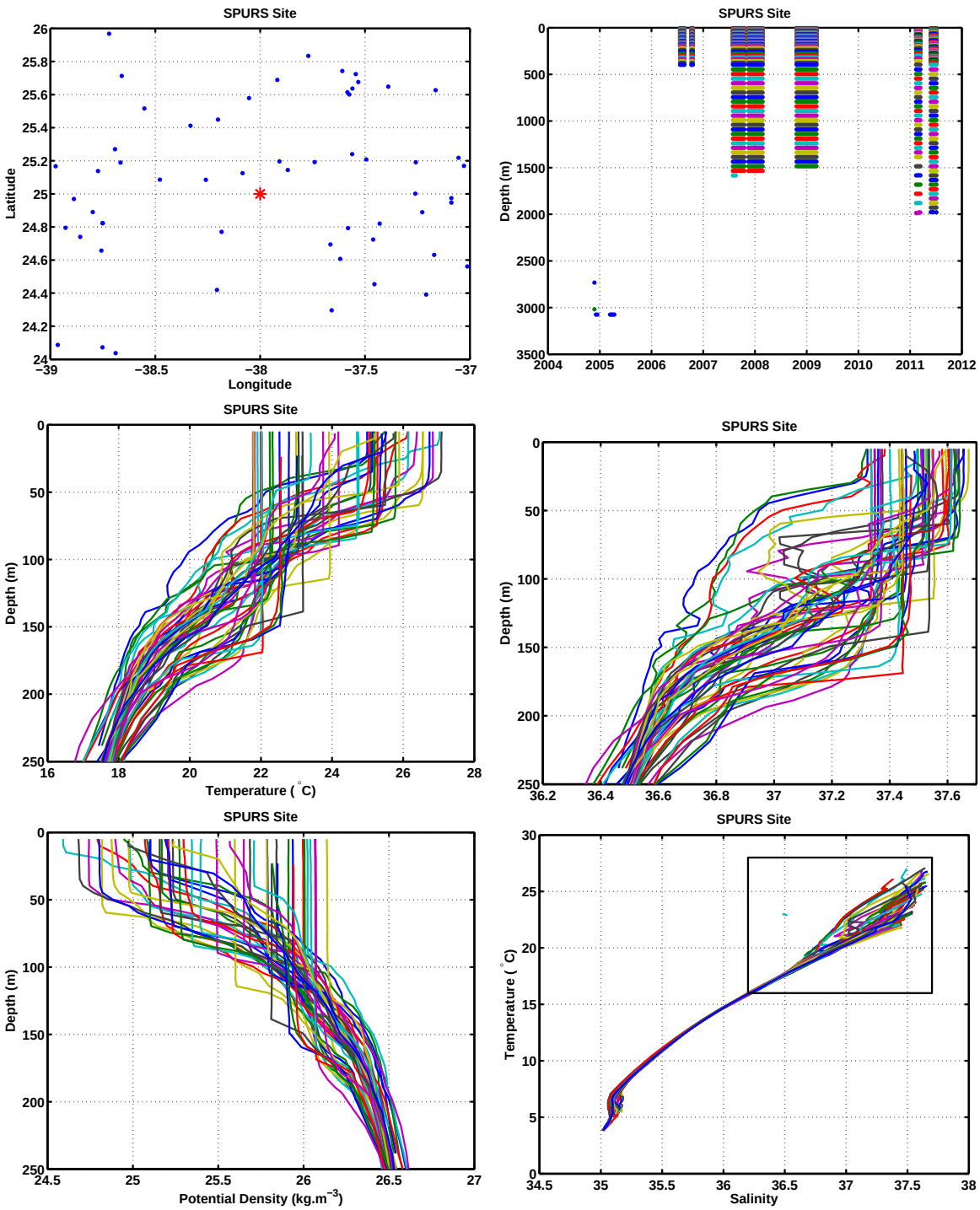
Precipitation data were retrieved from `http://www1.ncdc.noaa.gov/pub/data/gpcp/1dd-v1.1/` (directed thereto from `http://www.gewex.org/gpcpdata.htm`). Data are for 1-degree blocks centered on the half-degree. Daily precipitation data were extracted at the SPURS site (38W, 25N) by taking the mean of the surrounding four data points, and then manipulating to obtain the monthly descriptors. Shown are a time series and monthly mean presentations indicating the seasonal variability.



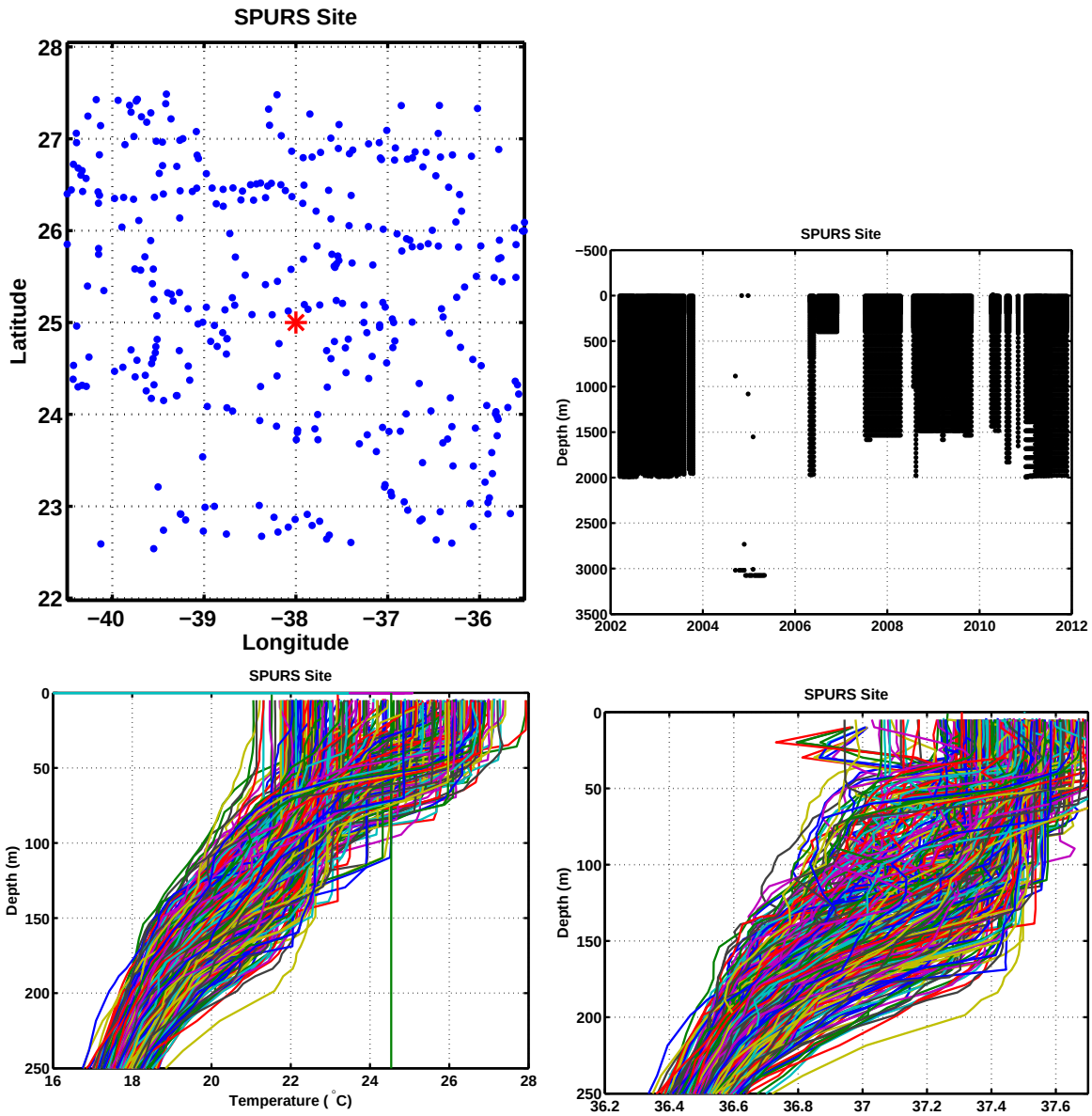

SPURS site
Monthly Precipitation (mm/month)
300
250
200
150
100
50
0
1
Column Number

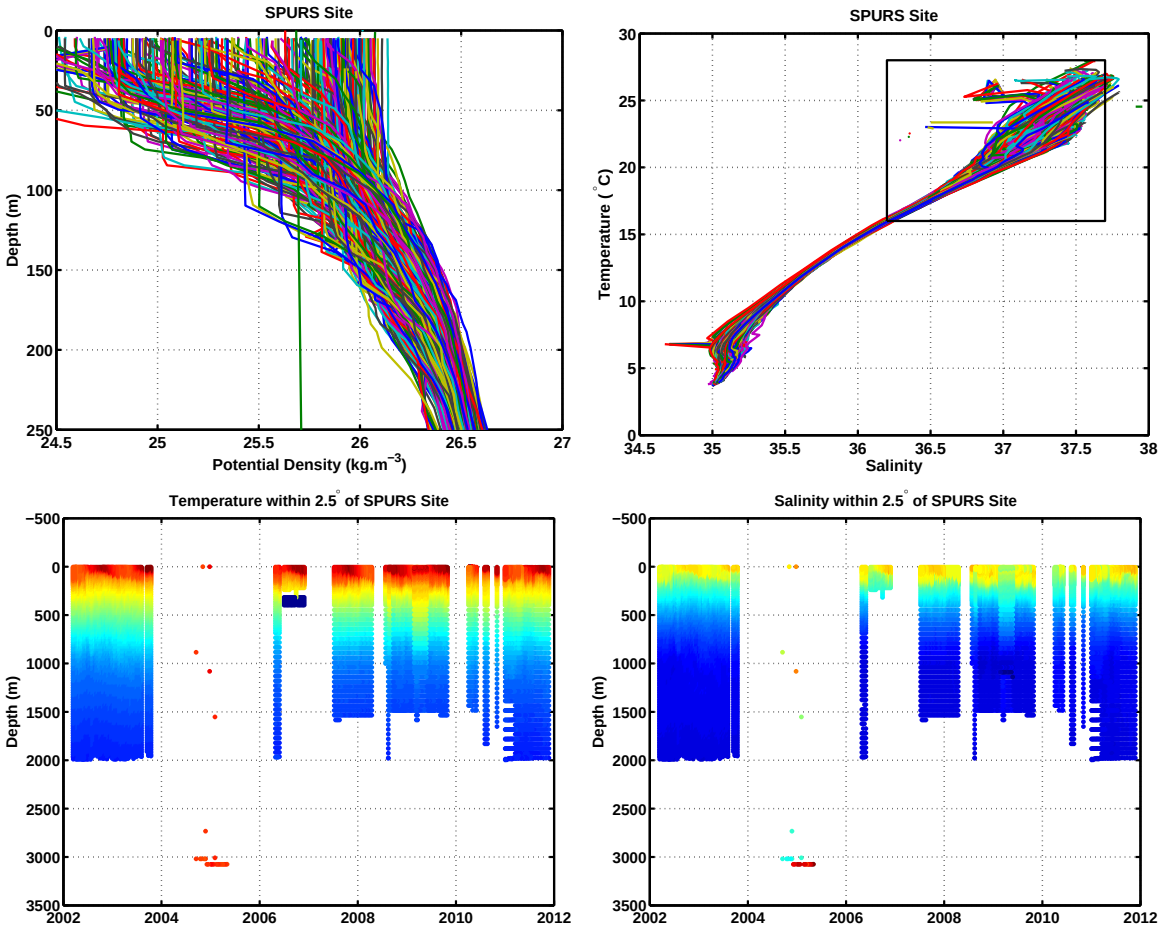
Near-surface Hydrography

ARGO data for the two-degree square around SPURS site (25N, 38W) were obtained from NODC and plotted. Shown are data sites and sample depths; vertical temperature, salinity and density; and temperature vs salinity (the box in the TS plot shows the limits of the T and S vertical profile plots above).



As above for ARGO data within 5-degree square around SPURS site. Included are color indexed scatter plots of the Temperature and Salinity. Otherwise as for the 2-degree box around SPURS site.




SPURS Site
Depth (m)
Potential Density (kg.m^{-3})
SPURS Site
Temperature (°C)
Salinity
Temperature within 2.5° of SPURS Site
Depth (m)
Salinity within 2.5° of SPURS Site
Depth (m)