

Establishment of New Research and Educational Collaboration With Colleagues at the University of the Aegean, Greece

PI: Anis, A.

The TCRF project main aim is establishment of new research and educational collaboration venues through international cooperation with colleagues at the University of the Aegean, Greece. In this respect, we have carried out a pilot study which included observational work focusing on coastal processes in the highly productive Kaloni Bay in Lesvos, Greece. The pilot study involved graduate students and faculty members from Texas A&M University in Galveston and the University of the Aegean with expertise in physical and chemical oceanography.

The project provided an excellent initial opportunity that should further lead to an improvement in our understanding of the physical processes that control the exchanges at bay entrances, and therefore is of direct interest to the Texas coast and bays. In particular, Kaloni Bay is similar in nature to bays along the Texas coast, such as Galveston Bay, and differentiates it significantly from classic semi-enclosed sea basins. The new knowledge that will be acquired will assist the ability to predict the response of bays to external forcing and allow improvement of management practices of bays and surrounding coastal areas. In the case of Texas bays, external forcing such as during tropical storms, is expected to significantly influence such exchanges at bay entrances.

To summarize, the TCRF funds, with the help of matching funds from the MARS department, TAMUG, supported this initial effort and are expected to lead to: (1) development of new lines of research; (2) further expose graduate and undergraduate students to international research venues and high impact learning opportunities in marine sciences and oceanography.



Figure 1: (L) Study region and location of two moorings instrumented with Acoustic Doppler Current Profiles (ADCPs) and temperature loggers. (T) Plaque commemorating the Greek philosopher Aristotle who carried out the first marine biology studies in this bay.

Following are some initial results from observations collected in June, 2019 at Kaloni Bay.

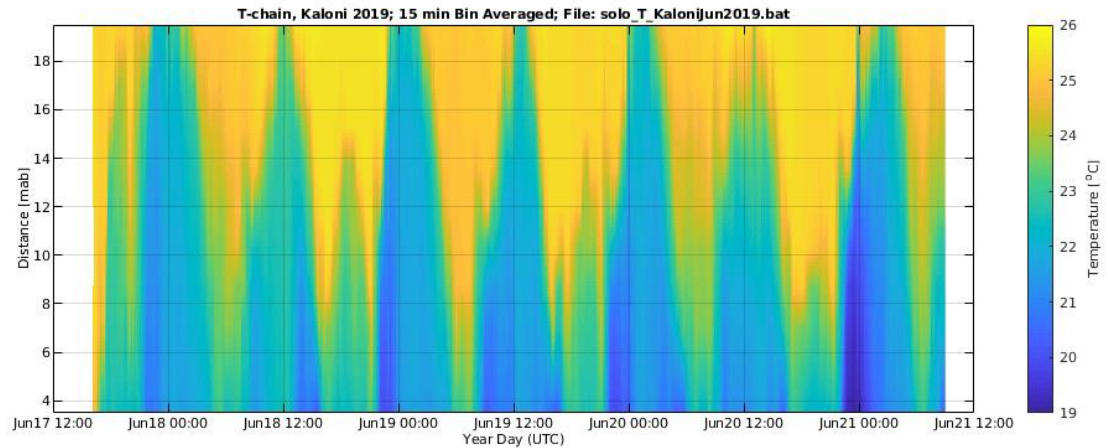


Figure 2: Thermal structure observed at the entrance of the bay (station 603 on the map above). Although the surface undulation due to the tides are relatively small (<0.3 m) the semidiurnal (period~12hours) nature of the large scale variability is clear.

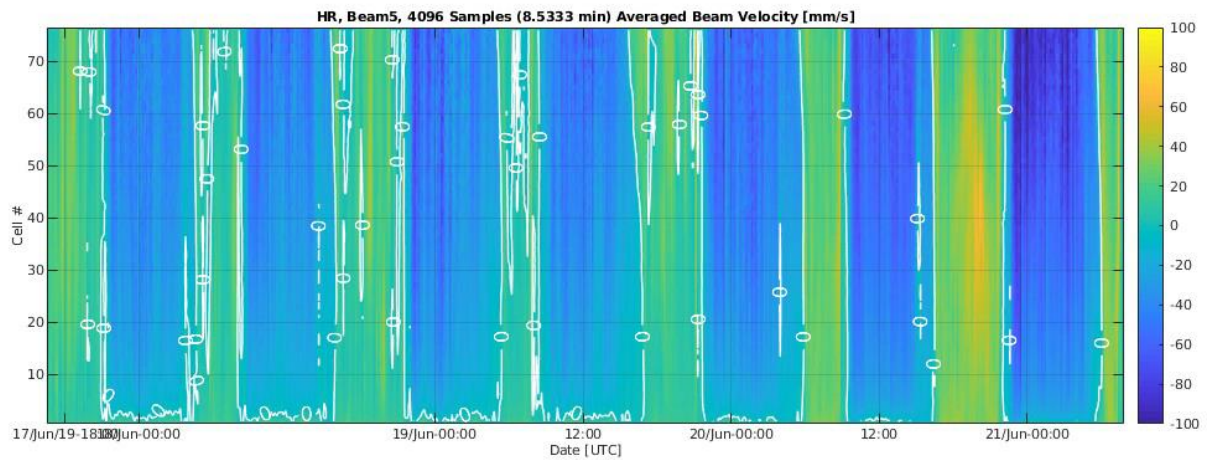


Figure 3: Vertical current field at the entrance of the bay (station 603 on the map above) from ADCP measurements Y-axis represent the vertical cell number such that cell 10 is at 1 m, cell 20 at 2 m, etc. above the bottom. Again the semidiurnal cycle is clear with significant alternating up (warmer colors) and down (cooler colors) velocities. The effect of the up velocities is to e.g. lift nutrients into the upper water column.