

Title: An Analysis of the Temporal Evolution of Sea Surface Temperature Structures in the Global Ocean

Description: We have developed a machine learning (ML) algorithm that determines the structure of 150 x150 km patches of sea surface temperature (SST) obtained from satellite-borne sensors and we have applied this algorithm to the 21-year global, 1-km MODerate-resolution Imaging Spectroradiometer (MODIS) SST dataset. The structure of the fields is characterized by a single number. We would like to examine how structure of these patches evolves in time. Specifically, the will student will partition the data into seven 3-year periods, average the measure of structure in 250 x 250 km squares and then examine how the mean structure evolves over the 21-year period, displaying the results as a global map of structure evolution. The student undertaking this project will learn about satellite-derived SST fields, characteristics of SST in the upper ocean, AI/ML applications in oceanography, computing in the cloud and manipulation of large datasets.

The student should have computer programming skills, preferably using Python.

Drs. Peter Cornillon and X Prochaska (UCSC)

Prospective students may contact us.