

## 2025-2026 Twinning Program Research Projects

### **PROJECT 3: Enhancing Pacific Tsunami Warning Center Operations Through Geospatial Data Analysis and Visualization**

#### **Project Director:**

Jonathan Weiss  
NOAA/NWS/Pacific Tsunami Warning Center (Honolulu, HI)

#### **Twin Mentor:**

Helen Janiszewski  
University of Hawaii at Manoa  
(Honolulu, HI)

#### **Project Summary:**

This project involves working with scientists at the NOAA/NWS/Pacific Tsunami Warning Center (PTWC) and the University of Hawaii Department of Earth Sciences on enhancing visual representations of earthquake- and tsunami-related information that are used to guide decision making while issuing domestic and international tsunami message products. For example, one of many small projects the intern could work on involves modifying existing computer programs to create a new set of map products that show maximum tsunami computer model wave heights for coastal warning points in Cascadia. Another small project consists of creating maps and graphics illustrating time-varying seismicity around Hawaii and Puerto Rico.

#### **Role and probable activities for a student researcher in this project:**

The student will initially gain familiarity with computer terminal windows, the command line interface, and basic Linux and Python programming aimed at geophysical, earthquake, and water-level data manipulation. Subsequently, the student will learn the widely employed Generic Mapping Tools (GMT), which is an open source collection of tools for manipulating geospatial data sets and producing tailored maps, plots and 3D perspectives. After this initial training, the student will use their newly acquired computer-based skills to modify existing and create new map/data products for PTWC areas of responsibility including the Cascadia Subduction Zone in the Pacific Northwest, the Hawaiian Islands, and the Caribbean including Puerto Rico. The products convey information such as earthquake source parameters and tsunami wave model output (e.g., predicted maximum wave heights at coastal warning points).

#### **Preferred Skills**

Ideally the student/intern will already be comfortable working with computers and will have some basic computer programming skills. However, this is not necessary as long as the student/intern is motivated and willing to learn something new.