

# Tsunami Society Field Trip- Friday May 26

## Field Trip Leaders- Dr. Charles Helsley, Dr. Barbara Keating, Dr. Dan Walker

Pickup: UH East-West Center at 8:15. Transportation by bus.

Stop 1: View from outside of Diamond Head Crater  
View the line of Honolulu Series volcanic cones



Stop 2 (above): Base of Diamond Head Crater

This photograph was taken at the bottom of the Diamond Head Lighthouse trail, here we will view the products of explosive volcanism, examine the modern weathering and erosion of the Diamond Head Crater, and observe caliche formation. In the surf zone you can find clasts of coral and basalt within gullies eroding in the Diamond Head cone.



### Stop 3: Molokai Lookout and Mystery Outcrop

From this lookout on the south side of the island of Oahu, visitors can see the nearby islands of Molokai and Lanai. On a very clear day Maui and the Big Island can also be seen.



#### Stop 4. Sandy Beach (Above) RESTROOM STOP

This shore break shown in the picture above is notorious for the number of people who have suffered from broken necks over the years. The sand on the beach is only inches thick on top of a lava flow. Thus, injuries at this bodysurfing beach park are often very serious. Note the large blowhole at the left in this picture. This photo was taken on a rough day, the red flag on the beach indicates that the surf is too rough and the beach is closed.

After the 1946-tsunami coral cobbles were left on the inland side of the highway, in the vicinity of the bus in the photo above.



Stop 5. Queens Beach Tsunami Deposits (above). Several outcrops show a series of coarse cobble layers covered by coarse sand. These are the deposits of the 1946 tsunami. A total of 22 waves were recorded on a tide gauge in Honolulu.



The 1946 Tsunami inundated the Queen's Beach coastal zone. The image above is a photograph of the remnant of the old "Round the island Highway" that was destroyed by the tsunami. We can compare this modern day photograph to that taken in 1946 and see

that the tsunami deposit is still visible. This area is a state wildlife preserve (turtles and birds) with limited access, and thus has seen limited use.



Stop 6. Makapu'u Lookout.(German geology students on Hawaii Field Trip)

The survivors of the 1946 tsunami, reported that the tsunami wrapped around Makapu'u Pt. headland and the run up in the valley behind Makapu'u Lookout. Evidence suggests that the tsunami reached in the vicinity of 80 ft elevation.

Photographs taken after the 1946 tsunami indicate that the tsunami stripped away the vegetation and left sand and gravel above the road shown in the picture above (near the telephone pole in the photograph.) A close up of that area is shown below.



The photograph above is taken from the parking lane adjacent to the highway. On the Cliffside above Makapu'u Beach, we find sand, coral cobbles and crab shells in the deposit roughly 28m above sea level. Preliminary modeling of the tsunami wave height here indicates at least 18m run up should have occurred. Chuck Helsley can be seen perched on the Cliffside, examining the deposits.

Discuss evidence for exceptionally high local runup.

Stop 7. Lunch (Beach Park with rest rooms)

After lunch, we will drive along the windward coast of Oahu. This is generally a rural area with the highway adjacent to the coast most of the way. The fringing reef is visible most of the way. Looking inland from the coast a giant cliff (Pali in Hawaiian) can be seen. This is the deeply weathered remnant of the faulted head wall of a giant landslide. One half of the eastern volcano has disappeared into the sea. A discussion about giant landslides and giant tsunami and multiple landslides and small tsunami is likely to occur.



Stop 8 . Stop at Laie to view 100, 000+ year old aeolian deposits

Stop 9. Shark's Bay (Restrooms available)



Boulders and Mega boulders are found along the north shore of Oahu (see example above). This area receives extremely strong winter storms each year. Waves up to 50 ft occur. In the photo above scientists check their watches – waiting for the next tsunami.

The photo below shows slabs of reef rocks on the beach in a cove along the Kahuku coast.



At Sharks Cove (on the North Shore) and at Kahe Point (on the southwest side of Oahu), large boulders of limestone can be seen broken from the sea cliff but still sitting in place. At Shark's Cove, boulders and Mega-boulders can be found on top of the reef flat. We will stop at the site and debate whether the boulders are moved during storms or perhaps tsunami events. Decades of aerial photographs show that some of the boulders

have been moved by major winter storms but the records do not go far enough back in time to say if the boulders are emplaced by storms or tsunami. (In the South Pacific, the oral tradition is that the boulders on top of the reefs were emplaced by hurricanes.)



Limestone blocks in place at Kahe Beach, Oahu.

Depart North Shore at 3:30.

Transit through the central portion of Oahu

Pacific Tsunami Warning Center visit on return to Honolulu. Return to EW-Center.

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