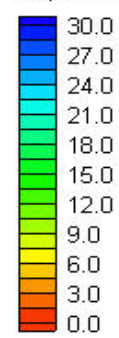


# *Southeast Oahu*

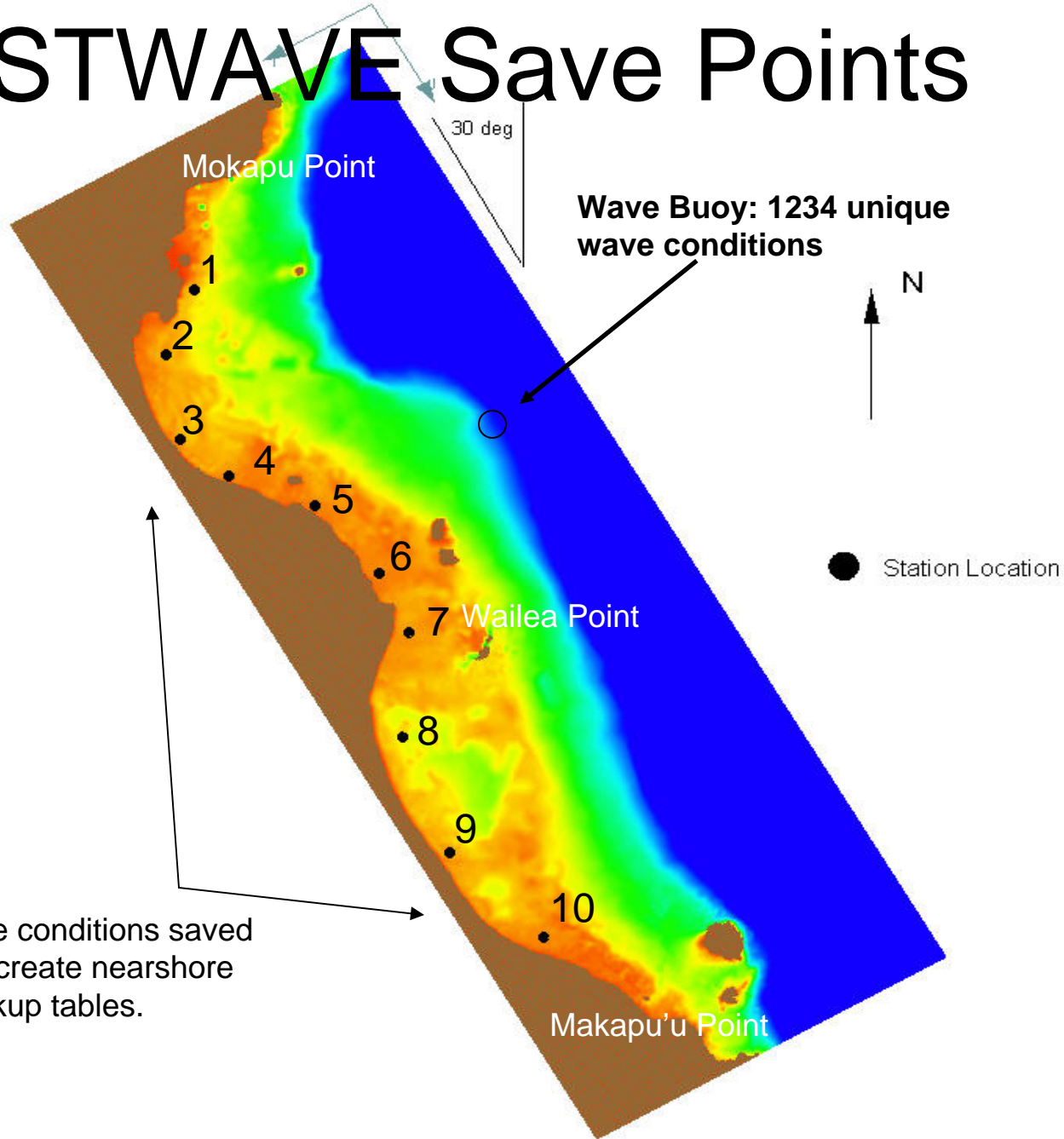
## **Regional Sediment Budget**



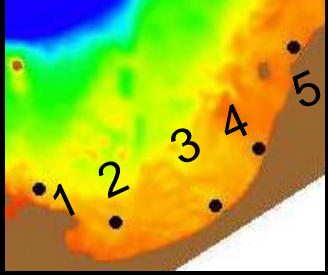
Depth, m MTL



# STWAVE Save Points



# Kailua Bay, Oahu, Hawaii Smoothed Rates



**ENCODER NOTES**

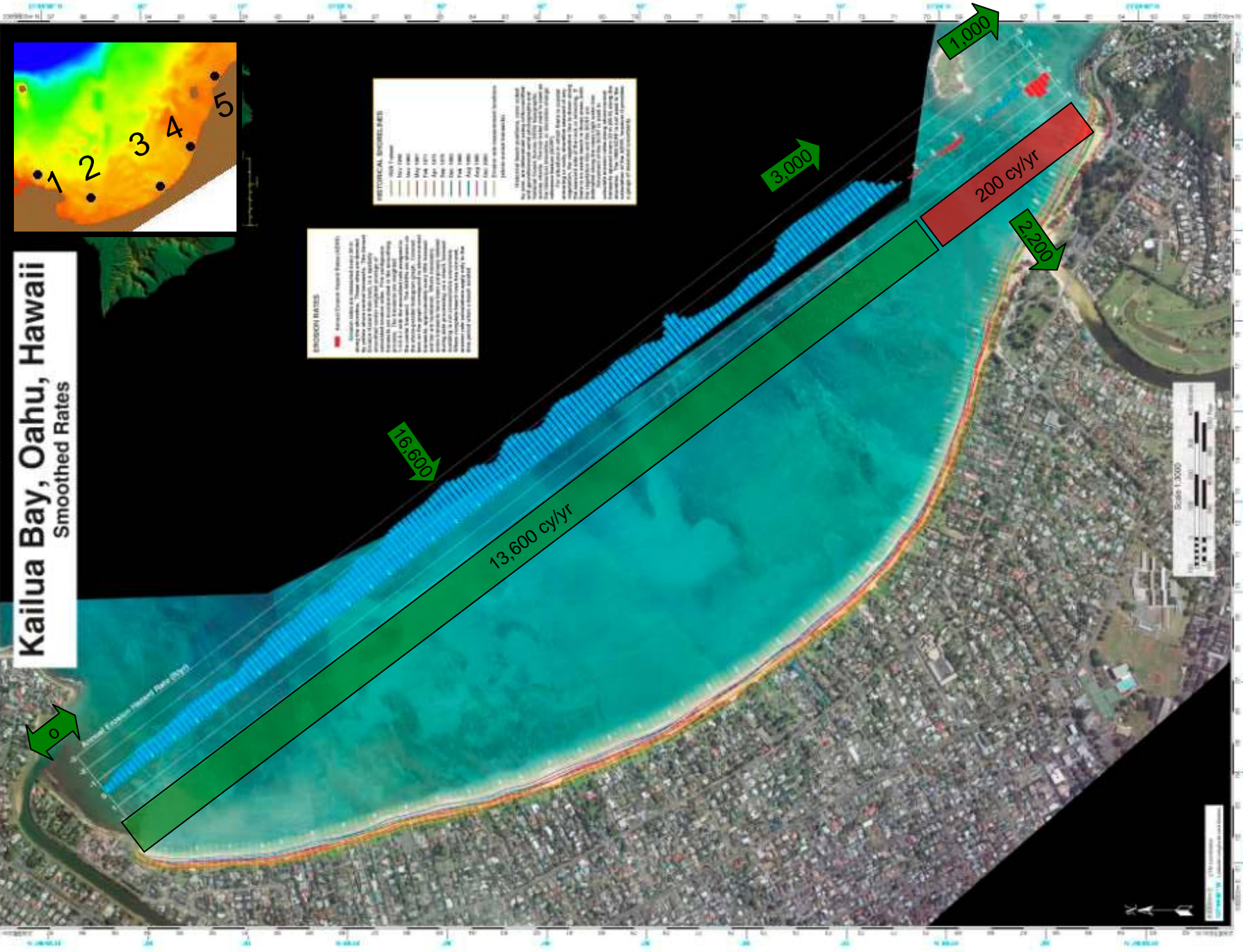
Forest Encoders Record Forest Health  
 The encoder records the smoothed rates for the entire forest area. The smoothed rates are calculated by averaging the encoder data over a 100m x 100m grid. The smoothed rates are then averaged over a 100m x 100m grid to produce the final smoothed rates. The smoothed rates are then averaged over a 100m x 100m grid to produce the final smoothed rates. The smoothed rates are then averaged over a 100m x 100m grid to produce the final smoothed rates.

**HISTORICAL SURVEY DATES**

Date	Color
May 1986	Blue
May 1987	Green
May 1988	Yellow
May 1989	Orange
May 1990	Red
May 1991	Dark Red
May 1992	Black

**ENCODER SURVEY DATES**

Date	Color
May 1986	Blue
May 1987	Green
May 1988	Yellow
May 1989	Orange
May 1990	Red
May 1991	Dark Red
May 1992	Black



# Lanikai, Oahu, Hawaii

## Smoothed Erosion Rates

### EROSION RATES

**Accretion**

**Annual Erosion Hazard Rates (AEHR)**

Erosion rates are measured every 26 m along the shoreline. These rates are displayed as Annual Erosion Hazard Rates (AEHR) in a standard weighted average of smoothed erosion rates. Five contiguous bins are incorporated in the smoothing process. The bins are weighted by the area of the bin. The AEHR are shown on the graph overlaid in a color gradient. Colored bins are numbered every 26 m segment and are numbered. Where necessary, distinct data processing is used to ensure that data processing is consistent. Where complete beach loss has occurred, erosion rate calculations apply only to the first point where a beach existed.

**HISTORICAL**

- 1911 Fossil
- 1928 Fossil
- Nov 1949
- Jul 1950
- Nov 1963
- May 1967
- Feb 1971
- Apr 1975
- Dec 1982
- Feb 1986
- Aug 1989
- Aug 1996
- Dec 2000

Erosion rate measurement locations (below normal tides)

Historical beach profiles, color coded by year, are overlaid on the map and georeferenced aerial photographs and National Ocean Survey (NOS) bathymetry arrays exist. The box raster mark is used as the reference for the location of the NOS bathymetry or shoreline change measurements. For situations in which there is coastal accretion or rocky shoreline seaward of any vegetation, the vegetation line is shown along the historical shoreline. The NOS bathymetry line is an aerial beach in those areas. Both the vegetation line and the SCDF are digitized along the mean high water line. Movement of the SCDF is used to determine the location of the shoreline. The NOS SCDF is not used in the calculation of the AEHR, however it provides a gauge of substantial consistency.

Annual Erosion Hazard Rates (cy/yr)

1,000

2,000

3,100

5,600

8,000

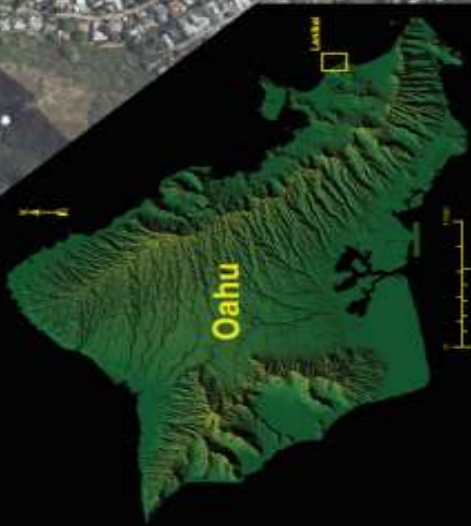
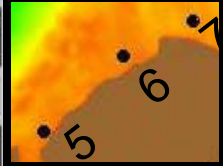
5,100

4,500

4,500

2,100

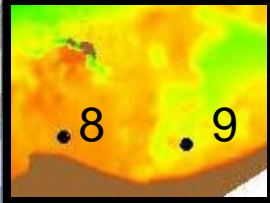
12,000 cy/yr



630000m E UTM coordinates  
 157°44'45" W Lanikai Longitude coordinate  
 632250m E 26

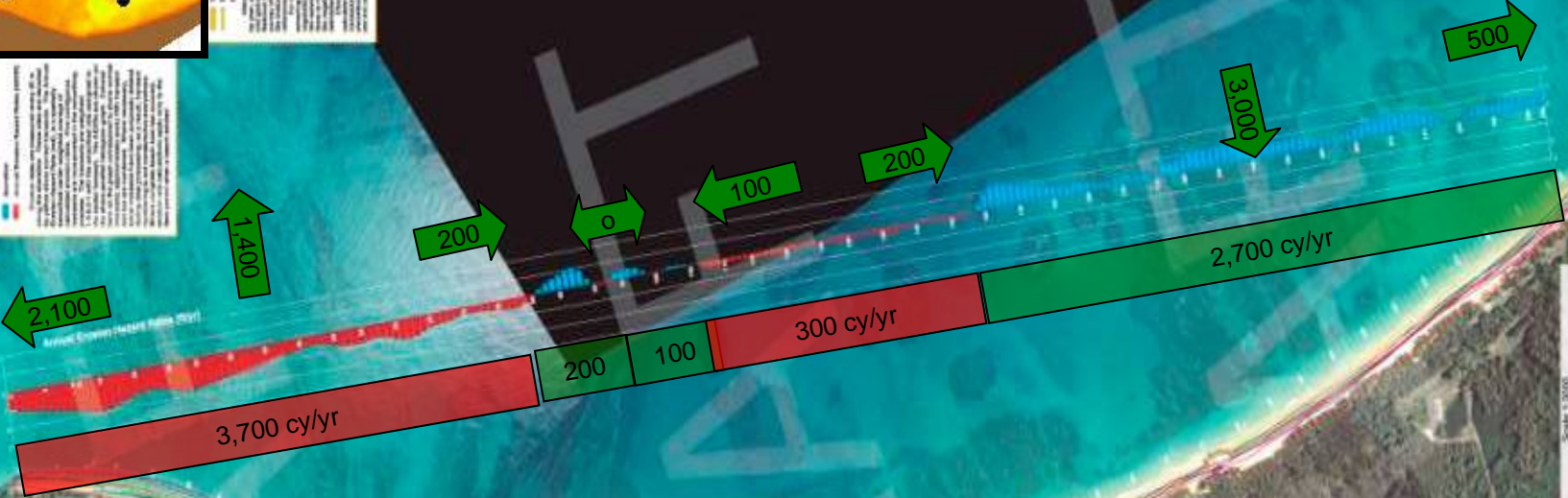


# Bellows, Oahu, Hawaii Smoothed Erosion Rates



**Legend**  
Erosion Rates (cy/yr)  
0 - 100  
100 - 200  
200 - 300  
300 - 400  
400 - 500  
500 - 600  
600 - 700  
700 - 800  
800 - 900  
900 - 1000  
1000 - 1100  
1100 - 1200  
1200 - 1300  
1300 - 1400  
1400 - 1500  
1500 - 1600  
1600 - 1700  
1700 - 1800  
1800 - 1900  
1900 - 2000  
2000 - 2100  
2100 - 2200  
2200 - 2300  
2300 - 2400  
2400 - 2500  
2500 - 2600  
2600 - 2700  
2700 - 2800  
2800 - 2900  
2900 - 3000  
3000 - 3100  
3100 - 3200  
3200 - 3300  
3300 - 3400  
3400 - 3500  
3500 - 3600  
3600 - 3700  
3700 - 3800  
3800 - 3900  
3900 - 4000  
4000 - 4100  
4100 - 4200  
4200 - 4300  
4300 - 4400  
4400 - 4500  
4500 - 4600  
4600 - 4700  
4700 - 4800  
4800 - 4900  
4900 - 5000  
5000 - 5100  
5100 - 5200  
5200 - 5300  
5300 - 5400  
5400 - 5500  
5500 - 5600  
5600 - 5700  
5700 - 5800  
5800 - 5900  
5900 - 6000  
6000 - 6100  
6100 - 6200  
6200 - 6300  
6300 - 6400  
6400 - 6500  
6500 - 6600  
6600 - 6700  
6700 - 6800  
6800 - 6900  
6900 - 7000  
7000 - 7100  
7100 - 7200  
7200 - 7300  
7300 - 7400  
7400 - 7500  
7500 - 7600  
7600 - 7700  
7700 - 7800  
7800 - 7900  
7900 - 8000  
8000 - 8100  
8100 - 8200  
8200 - 8300  
8300 - 8400  
8400 - 8500  
8500 - 8600  
8600 - 8700  
8700 - 8800  
8800 - 8900  
8900 - 9000  
9000 - 9100  
9100 - 9200  
9200 - 9300  
9300 - 9400  
9400 - 9500  
9500 - 9600  
9600 - 9700  
9700 - 9800  
9800 - 9900  
9900 - 10000

**REVISIONS**  
1. Initial Erosion Rates (cy/yr)  
2. Smoothed Erosion Rates (cy/yr)  
3. Final Erosion Rates (cy/yr)  
4. Final Erosion Rates (cy/yr)  
5. Final Erosion Rates (cy/yr)  
6. Final Erosion Rates (cy/yr)  
7. Final Erosion Rates (cy/yr)  
8. Final Erosion Rates (cy/yr)  
9. Final Erosion Rates (cy/yr)  
10. Final Erosion Rates (cy/yr)  
11. Final Erosion Rates (cy/yr)  
12. Final Erosion Rates (cy/yr)  
13. Final Erosion Rates (cy/yr)  
14. Final Erosion Rates (cy/yr)  
15. Final Erosion Rates (cy/yr)  
16. Final Erosion Rates (cy/yr)  
17. Final Erosion Rates (cy/yr)  
18. Final Erosion Rates (cy/yr)  
19. Final Erosion Rates (cy/yr)  
20. Final Erosion Rates (cy/yr)  
21. Final Erosion Rates (cy/yr)  
22. Final Erosion Rates (cy/yr)  
23. Final Erosion Rates (cy/yr)  
24. Final Erosion Rates (cy/yr)  
25. Final Erosion Rates (cy/yr)  
26. Final Erosion Rates (cy/yr)  
27. Final Erosion Rates (cy/yr)  
28. Final Erosion Rates (cy/yr)  
29. Final Erosion Rates (cy/yr)  
30. Final Erosion Rates (cy/yr)  
31. Final Erosion Rates (cy/yr)  
32. Final Erosion Rates (cy/yr)  
33. Final Erosion Rates (cy/yr)  
34. Final Erosion Rates (cy/yr)  
35. Final Erosion Rates (cy/yr)  
36. Final Erosion Rates (cy/yr)  
37. Final Erosion Rates (cy/yr)  
38. Final Erosion Rates (cy/yr)  
39. Final Erosion Rates (cy/yr)  
40. Final Erosion Rates (cy/yr)  
41. Final Erosion Rates (cy/yr)  
42. Final Erosion Rates (cy/yr)  
43. Final Erosion Rates (cy/yr)  
44. Final Erosion Rates (cy/yr)  
45. Final Erosion Rates (cy/yr)  
46. Final Erosion Rates (cy/yr)  
47. Final Erosion Rates (cy/yr)  
48. Final Erosion Rates (cy/yr)  
49. Final Erosion Rates (cy/yr)  
50. Final Erosion Rates (cy/yr)



# Waimanalo, Oahu, Hawaii

## Smoothed Erosion Rates

**EROSION RATES**

█ Accretion  
█ Annual Erosion Hazard Rates (AEHR)

Erosion rates are measured every 20 m along the shoreline. These sites are denoted by yellow shore-normal transects. The Annual Erosion Hazard Rate (AEHR), is a spatially smoothed center-entrained average of calculated erosion rates. Five contiguous transects are incorporated in the smoothing process. The transects are weighted 1-3-3-3-1 with the smoothed rate assigned to the center transect. The AEHRs are shown on the shore-normal histogram graph. Colored bars on the graph correspond to shore-normal transects, approximately every 10th transect, and bar site numbered. Where necessary, some transects have been purposely deleted during data processing, as a result, transect numbering is not consecutive everywhere. Where complete beach loss has occurred, erosion rate calculations apply only to the time period when a beach existed.

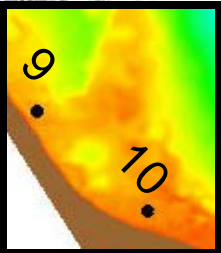
**HISTORICAL SHORELINES**

- █ 1911 T-sheet
- █ 1927
- █ 1928 T-sheet
- █ Nov 1948
- █ Jul 1991
- █ Nov 1992
- █ May 1993
- █ Feb 1997
- █ Apr 1975
- █ Feb 1988
- █ Aug 1988
- █ Dec 2000
- █ Erosion rate measurement locations (shore-normal transects)

Historical beach positions, color coded by year, are determined using orthorectified and georeferenced aerial photography and National Ocean Survey (NOS) topographic survey sheets. The low water mark is used as the historical shoreline, or shoreline change reference feature (SCRFF).

For locations where there is coastal armoring or rocky shorelines seaward of any vegetation, the vegetation line is drawn along the seaward side of the rock or armoring. If there is no sandy beach in these areas, both the vegetation line and the SCRFF are delineated along the mean high water line.

Changes of the SCRFF is used to calculate erosion rates along shore-normal transects spaced every 20 m (26 ft) along the shoreline. 1951 and 1952 SCRFFs are not used in the calculation of the AEHR.



500

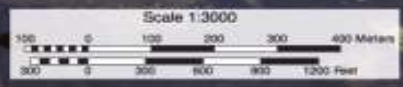
1,600 cy/yr

1,100

2,000

800 cy/yr

1,700



# Makapuu, Oahu, Hawaii Smoothed Erosion Rates

UTM coordinates  
629700m E 1572910m N  
UTM coordinates  
629700m E 1572910m N

**EROSION RATES**

Accretion  
Annual Erosion Hazard Rates (AEHR)

Erosion rates are measured every 20 m along the shoreline. These sites are denoted by yellow white corner brackets. The Annual Erosion Hazard Rate (red), is a spatially smoothed vector weighted average of calculated erosion rates. Five contiguous transects are incorporated in the smoothing process. The transects are weighted 1:3:3:3:1 with the smoothed rate assigned to the center transect. The AEHRs are shown on the shore-parallel histogram graph. Colored bars on the graph correspond to shore-normal transects, approximately every 100m transect and bar are numbered. Where necessary, some transects have been purposely deleted during data processing; as a result, transect numbering is not consecutive everywhere. Where complete beach loss has occurred, erosion rate calculations apply only to the time period when a beach existed.

**HISTORICAL SHORELINES**

- 1911 T-sheet
- 1937
- 1958 T-sheet
- Nov 1988
- Jul 1991
- May 1993
- Feb 1997
- Apr 1975
- Feb 1988
- Aug 1988
- Dec 2005
- Erosion rate measurement locations (shore-normal transects)

Historical beach positions, color coded by year, are determined using air-photo-rectified and georectified aerial photographs and National Ocean Survey (NOS) topographic survey charts. The low water mark is used as the historical shoreline, or shoreline change reference feature (SCRPF). For locations where there is coastal armoring or rocky shoreline seaward of any vegetation, the vegetation line is drawn along the seaward side of the rock or armoring. If there is sandy beach in these areas, both the vegetation line and the SCRPF are delineated along the mean high water line. Change of the SCRPF is used to calculate erosion rates along shore-normal transects spaced every 20 m (50 ft) along the shoreline. 1951 and 1967 SCRPFs are not used in the calculation of the AEHR.

1,700

3,800

2,100 cy/yr

100

100

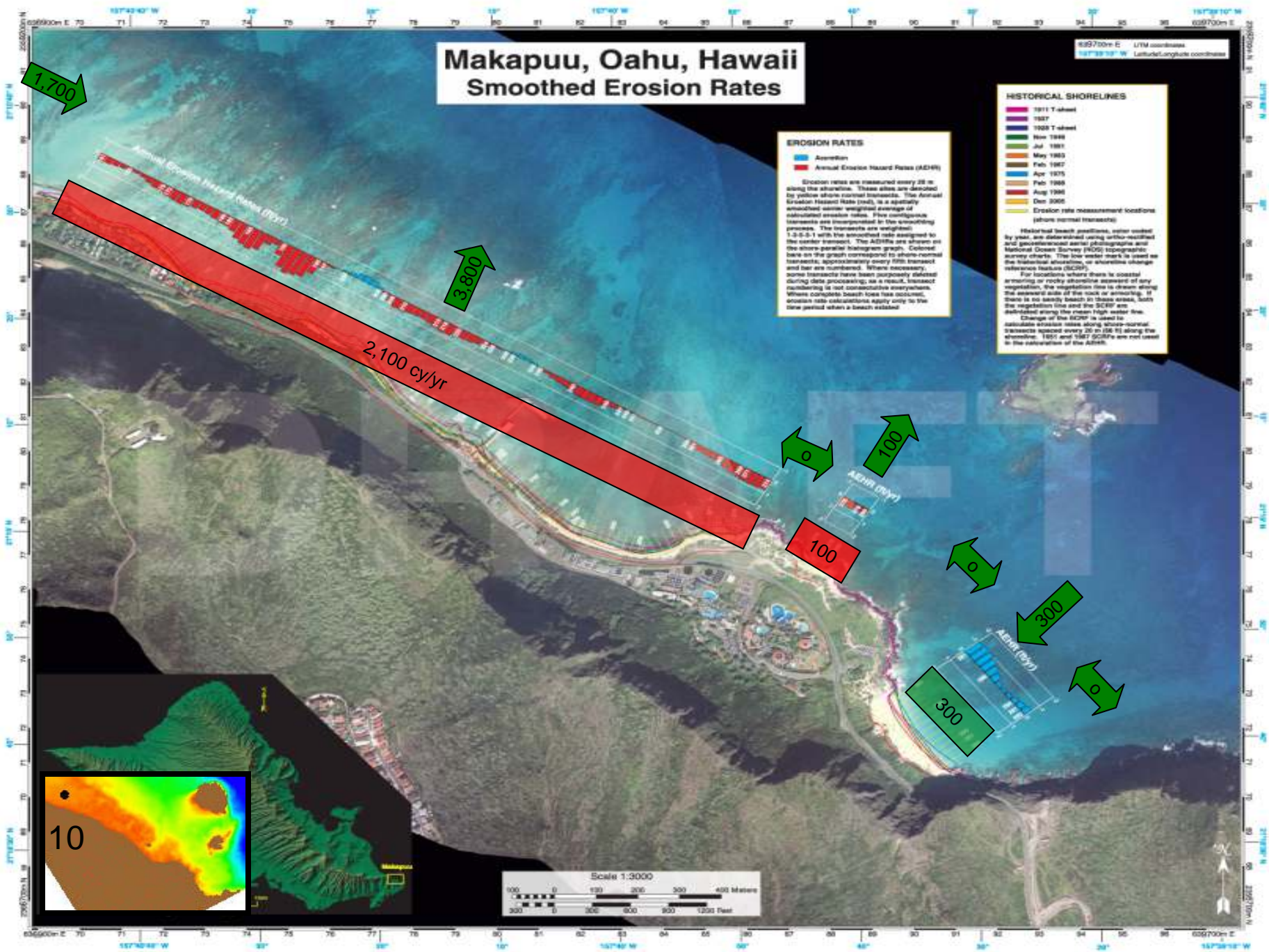
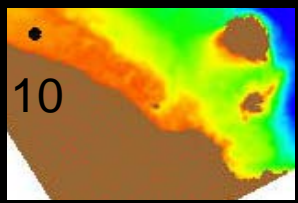
100

300

300

300

300





Thank You