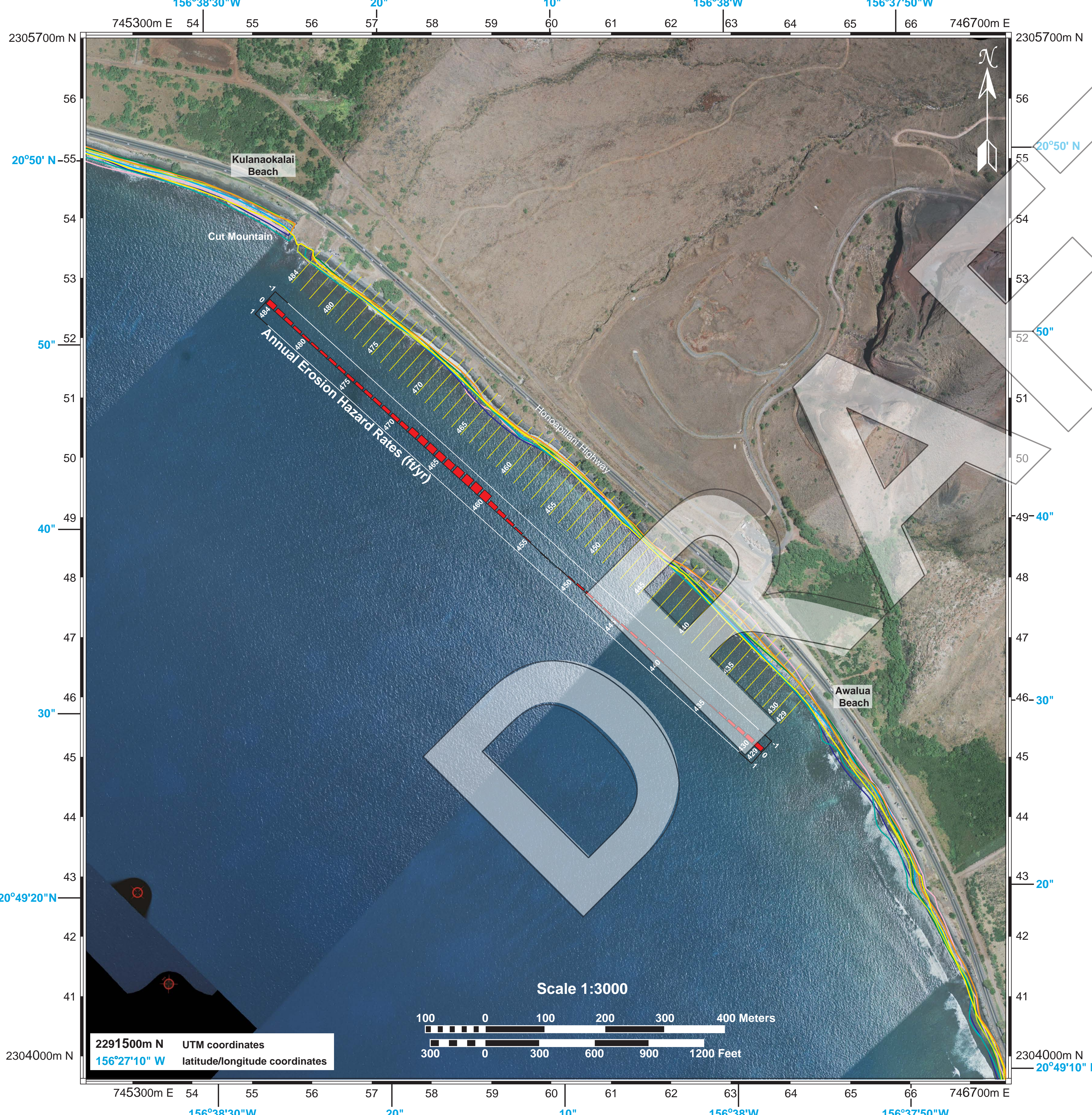
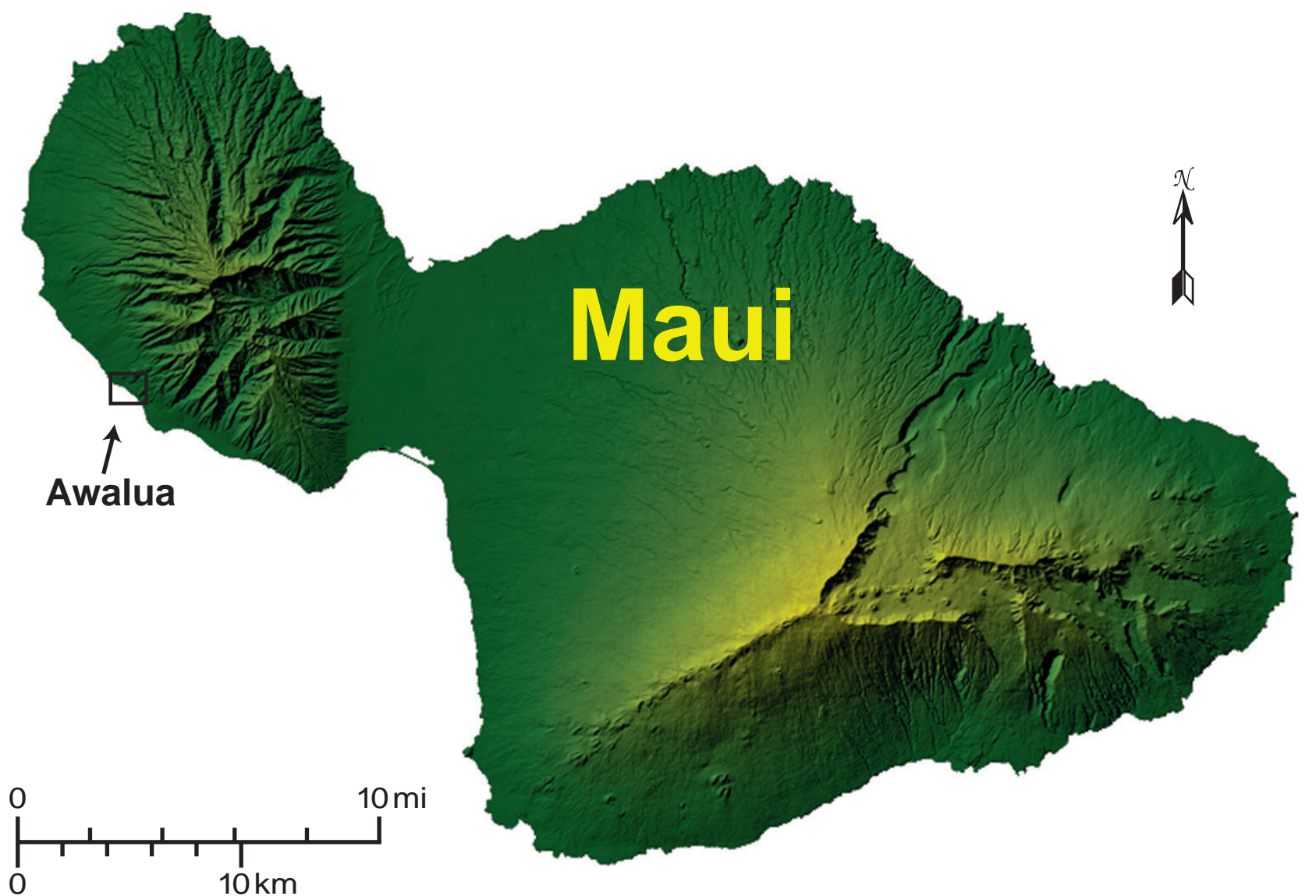


Awalua, Maui, Hawaii

Annual Erosion Hazard Rates



TRANSECT	AEHR (ft/yr)
429	-0.317
430	-0.297
431	-0.248
432	-0.188
433	-0.126
434	-0.066
435	-0.016
436	0.016
437	0.020
438	0.001
439	-0.029
440	-0.072
441	-0.124
442	-0.154
443	-0.152
444	-0.120
445	-0.087
446	-0.101
447	-0.123
448	-0.139
449	-0.122
450	-0.070
451	-0.027
452	0.063
453	0.042
454	-0.001
455	-0.062
456	-0.124
457	-0.193
458	-0.265
459	-0.328
460	-0.579
461	-0.586
462	-0.571
463	-0.534
464	-0.489
465	-0.474
466	-0.473
467	-0.462
468	-0.430
469	-0.284
470	-0.267
471	-0.255
472	-0.243
473	-0.231
474	-0.215
475	-0.206
476	-0.206
477	-0.203
478	-0.182
479	-0.163
480	-0.170
481	-0.200
482	-0.257
483	-0.315
484	-0.385



HISTORICAL SHORELINES

- 1912 T-sheet
- Nov 1949
- Oct 1960
- Mar 1975
- Jul 1987
- Mar 1988
- May 1997
- June 2007

Erosion rate measurement locations (shore normal transects)

Historical beach positions, color coded by year, are determined using ortho-rectified and georeferenced 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 (SCRF).

For situations in which 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 no sandy beach in these areas, both the vegetation line and the SCRF are delineated along the mean high water line.

Movement of the SCRF is used to calculate erosion rates along shore-normal transects spaced every 20 m (66 ft) along the shoreline. The 1987 SCRF is not used in the calculation of the Annual Erosion Hazard Rate (AEHR). It is used in determining seasonal uncertainty.

ANNUAL EROSION HAZARD RATES (AEHR)

- Accretion Rate
- Erosion Rate

Historical shoreline positions are measured every 66 ft along the shoreline. These sites are denoted by yellow shore-perpendicular transects. Changes in the position of the shorelines through time are used to calculate shoreline change rates (ft/yr) at each transect location.

Annual erosion hazard rates (AEHR) are shown on the shore-parallel graph. Red bars on the graph indicate a trend of beach erosion, while blue bars indicate a trend of accretion. Approximately every fifth transect and bar of the graph is numbered. Where necessary, transects have been purposely deleted to maintain consistent along-shore spacing. As a result transect numbering is not consecutive everywhere.

The Single Transect (ST) method (Genz et al., 2009) is used to calculate erosion hazard rates for the study area. The rates are smoothed alongshore using a 1-3-5-3-1 technique to normalize rate differences on adjacent transects. For more information on erosion rate methods and results see: <http://www.soest.hawaii.edu/coasts/erosion/index.php>

Genz*, A.S., Frazer, L.N., and Fletcher, C.H. (2009) Toward parsimony in shoreline change prediction (II): Applying basis function methods to real and synthetic data. *Journal of Coastal Research*, vol. 25, no. 2: 380-392.

The Awalua study area (transects 429 – 484) extends from Cut Mountain in the north to Awalua Beach in the south. The shoreline is characterized by black sand, cobble and coral rubble. Offshore, the bottom is dominated by rocky shoals. Onshore, the coast is separated from the highway by a thin partition of kiawe trees and palms.

This relatively small section of coastline has experienced light erosion over time with an average AEHR of -0.2 ft/yr. The southern portion of the area (transects 429 - 456) has experienced slight erosion with an average AEHR of -0.1 ft/yr while the northern portion (transects 457 - 484) has experienced light erosion with an average AEHR of -0.3 ft/yr.

Average beach width, the average horizontal distance from the vegetation line to the low water mark, within the Awalua study area has varied over time. Between 1949 and 2007, average beach width in the area has increased 11% (~ 12 ft). The majority of this gain in beach width is in the southern portion of the area (transects 429 – 456) that has experienced an increase of 26% between 1959 and 2007. The northern half of the area (transects 457 - 484) has experienced a small decrease in average beach width of 2% between 1949 and 2007 over the same period.

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