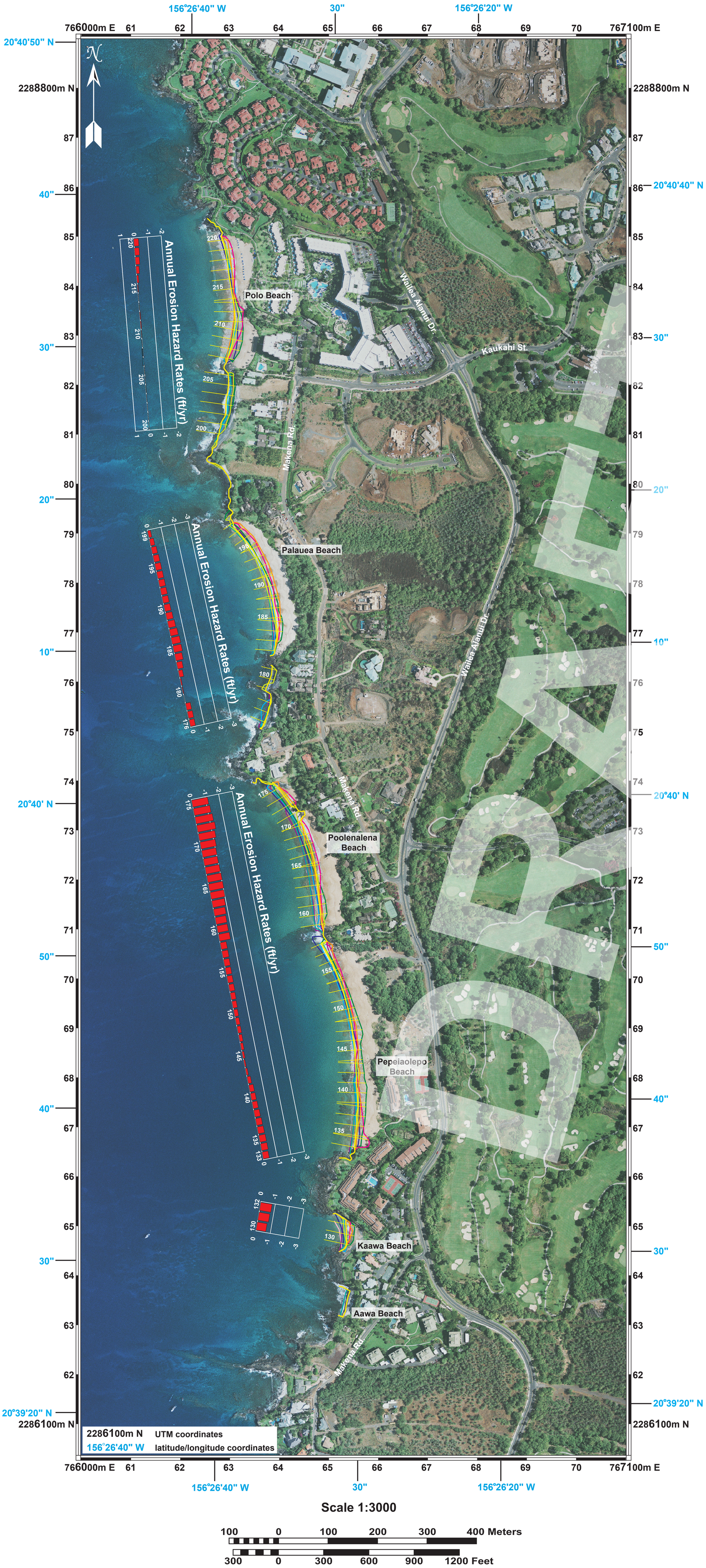
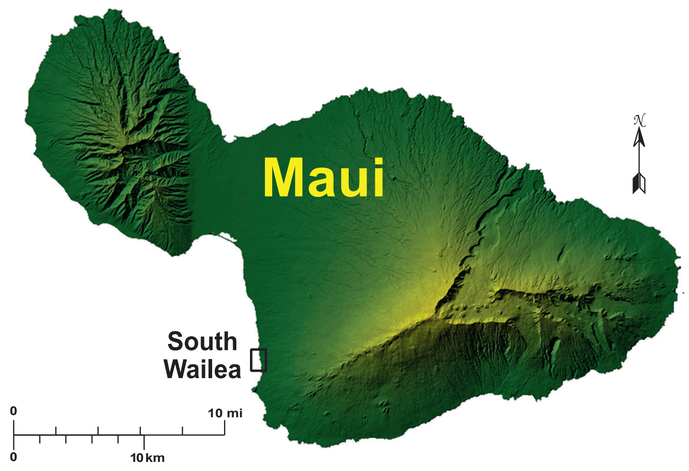
South Wailea, Maui, Hawaii

Annual Erosion Hazard Rates





AREA DESCRIPTION

The South Wailea study area (transects 130 - 220) is located on the south Kihei Coast, Maui. The coast is exposed to south swell in summer, refracted northwest swell in winter, and Kona storm waves. The deep fringing reef provides little protection and waves break on or near the shoreline. Basalt headlands divide the study area shoreline into several embayments with calcareous sand beaches.

Beginning in the south, Kaawa Beach (transects 130-132) has experienced moderate erosion since 1931 with an average AEHR of -0.74 ft/yr. Pepeiaolepo Beach (transects 133 - 158) has been slightly to moderately erosive since 1931 with an average AEHR of -0.3 ft/yr. On the north side of a short headland separating the two beaches, Poolenalena Beach (transects 159 - 175) has experienced moderate to high rates of erosion (up to -1.3 ft/yr at transect 172) with an average AEHR of -1.0 ft/yr. Palauea Beach (transects 182 - 199) has experienced low to moderate erosion with an average AEHR of -0.4 ft/yr. Polo Beach (transects 206 - 220) has been relatively stable to slightly erosive since 1931 with an average AEHR of -0.1 ft/yr.

HISTORICAL SHORELINES

- 1931 T-sheet
- Nov 1949
- Oct 1960
- May 1963
- Mar 1975
- Jul 1987
- Mar 1988
- Nov 1992
- May 1997
- Apr 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.

TRANSECT	AEHR (ft/yr)
130	-0.675
131	-0.748
132	-0.788
133	-0.430
134	-0.471
135	-0.469
136	-0.451
137	-0.430
138	-0.400
139	-0.367
140	-0.345
141	-0.327
142	-0.245
143	-0.135
144	-0.097
145	-0.133
146	-0.191
147	-0.233
148	-0.254
149	-0.265
150	-0.282
151	-0.312
152	-0.343
153	-0.370
154	-0.384
155	-0.395
156	-0.412
157	-0.439
158	-0.445
159	-0.790
160	-0.766
161	-0.780
162	-0.839
163	-0.924
164	-0.998
165	-1.038
166	-1.045
167	-1.031
168	-1.021
169	-1.037
170	-1.108
171	-1.210
172	-1.320
173	-1.272
174	-1.213
175	-1.167
176	-0.372
177	-0.372
178	-0.353
179	0.001
180	-0.046
181	-0.076
182	-0.300
183	-0.404
184	-0.527
185	-0.606
186	-0.612
187	-0.566
188	-0.510
189	-0.465
190	-0.436
191	-0.427
192	-0.429
193	-0.431
194	-0.425
195	-0.416
196	-0.407
197	-0.370
198	-0.303
199	-0.212
200	-0.007
201	-0.003
202	-0.004
203	-0.013
204	-0.015
205	-0.010
206	-0.011
207	0.078
208	0.053
209	0.017
210	-0.027
211	-0.048
212	-0.041
213	-0.012
214	-0.006
215	-0.045
216	-0.126
217	-0.221
218	-0.298
219	-0.335
220	-0.341

Scale 1:3000

100 0 100 200 300 400 Meters

300 0 300 600 900 1200 Feet

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Maui Shoreline Atlas 2007