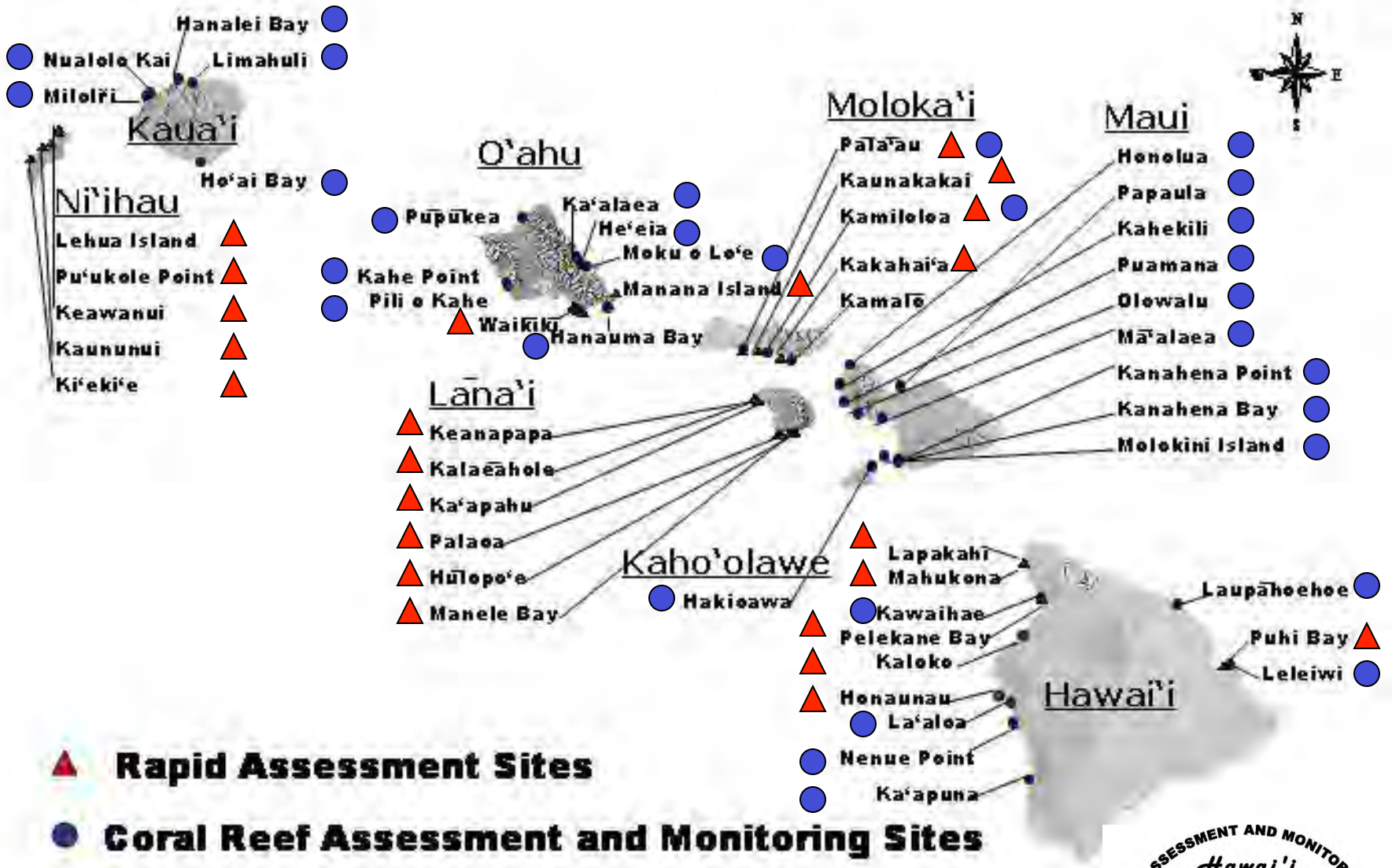

Hanalei Bay
Nualolo Kai
Limahuli
Miloli'i
Kaua'i
Ho'ai Bay
Ni'ihau
Lehua Island
Pu'ukole Point
Keawanui
Kaununui
Ki'eki'e
O'ahu
Pūpūkea
Ka'alaea
He'eia
Moku o Lo'e
Kahe Point
Pili o Kahe
Manana Island
Waikiki
Hanauma Bay
Moloka'i
Pālā'au
Kaunakakai
Kamiloloa
Kakahai'a
Kamalō
Maui
Honolua
Papaula
Kahekili
Puamana
Olowalu
Mā'alaea
Kanahena Point
Kanahena Bay
Molokini Island
Lāna'i
Keanapapa
Kalaēahole
Ka'apahu
Palaoa
Hūlopo'e
Manele Bay
Kaho'olawe
Hakioawa
Lapakahi
Mahukona
Kawaihae
Pelekane Bay
Kaloko
Honaunau
La'aloa
Nenue Point
Ka'apuna
Laupāhoehoe
Puhi Bay
Leleiwi
Hawai'i
N
E
S
Rapid Assessment Sites
Coral Reef Assessment and Monitoring Sites
20
40
80
120
160
kilometers
CORAL REEF ASSESSMENT AND MONITORING PROGRAM
Hawai'i

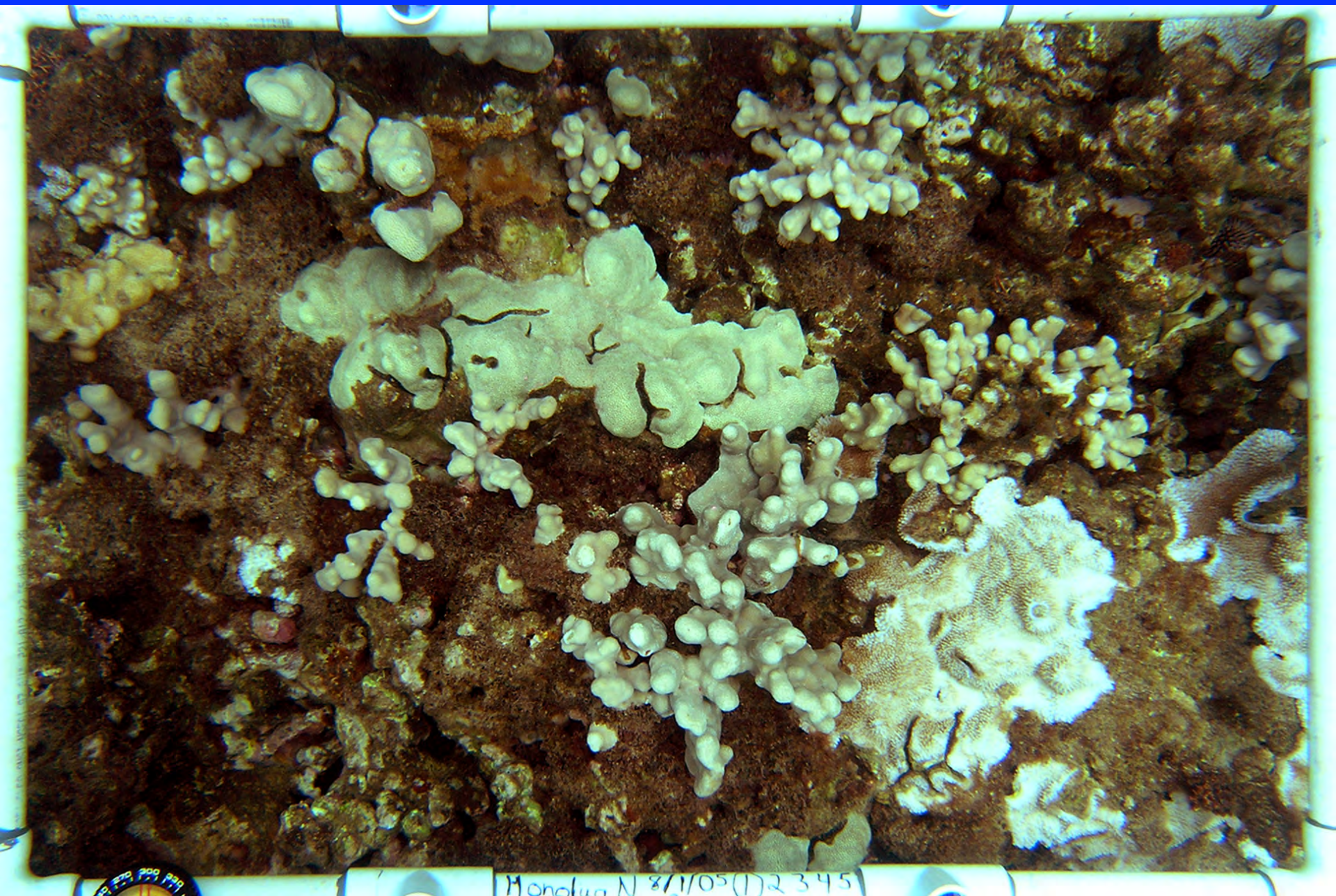
Kahe Point Electric Generating Station, O ʻahu, Hawai ʻi

Coral Reef Ecology Lab at the Hawai ʻi Institute of Marine Biology

Methodology

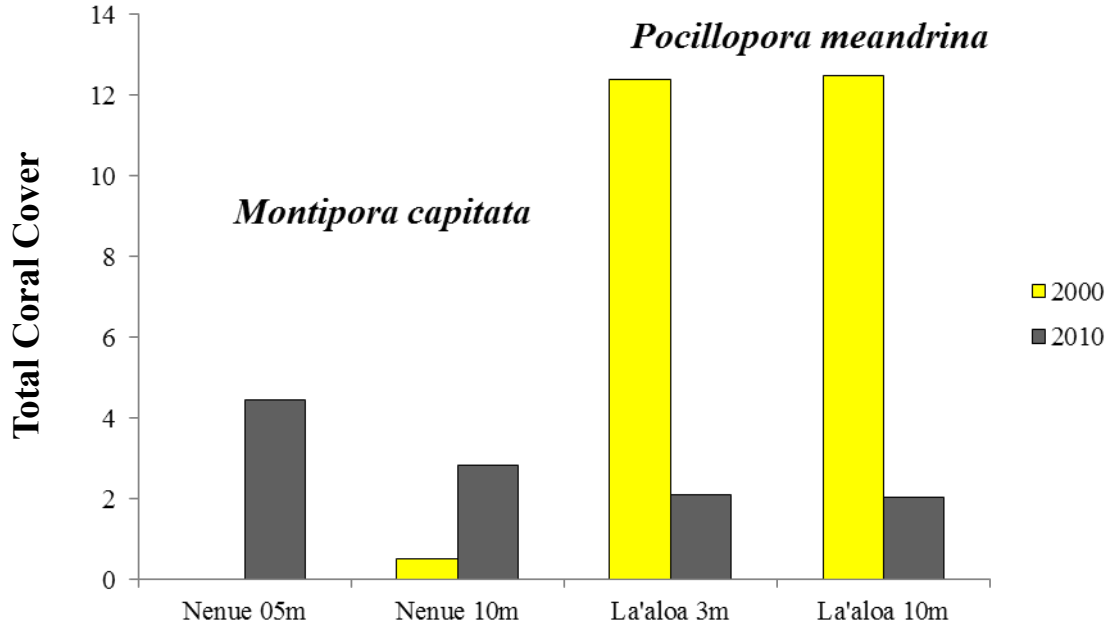
Maui Honolua N 3m, Quadrat 1

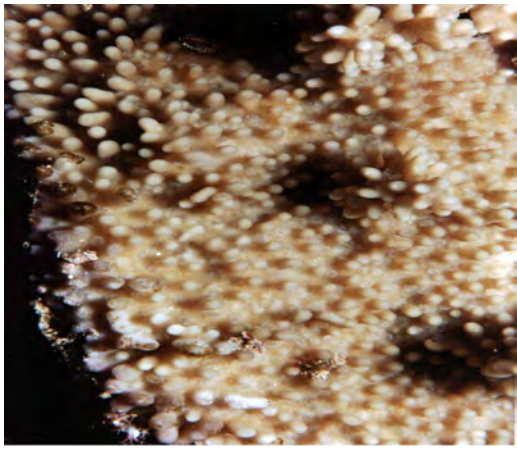
2005

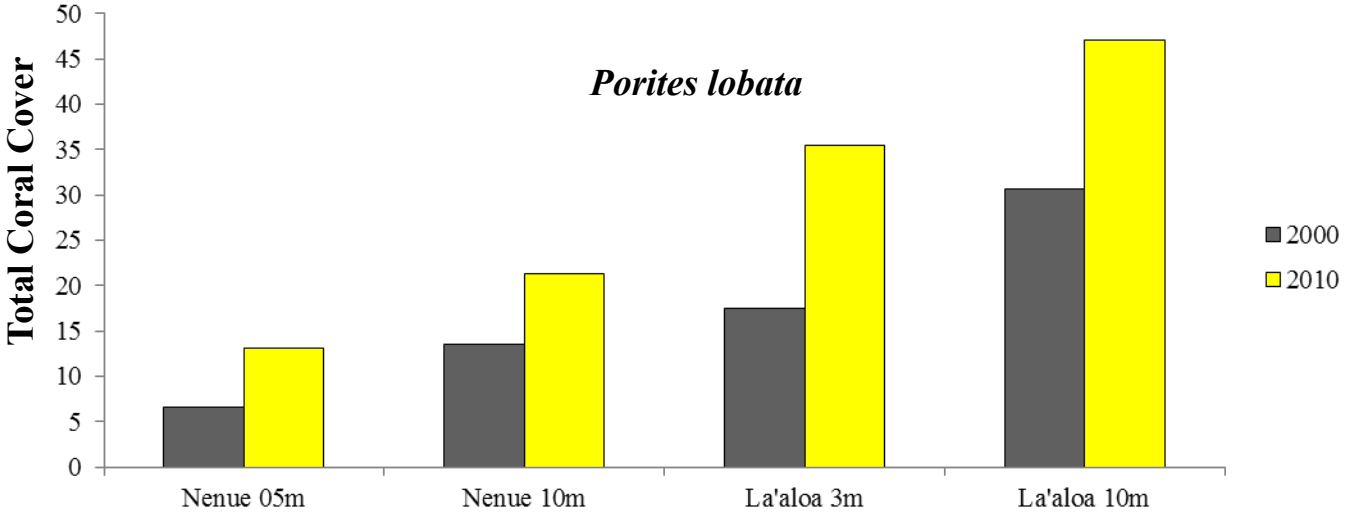


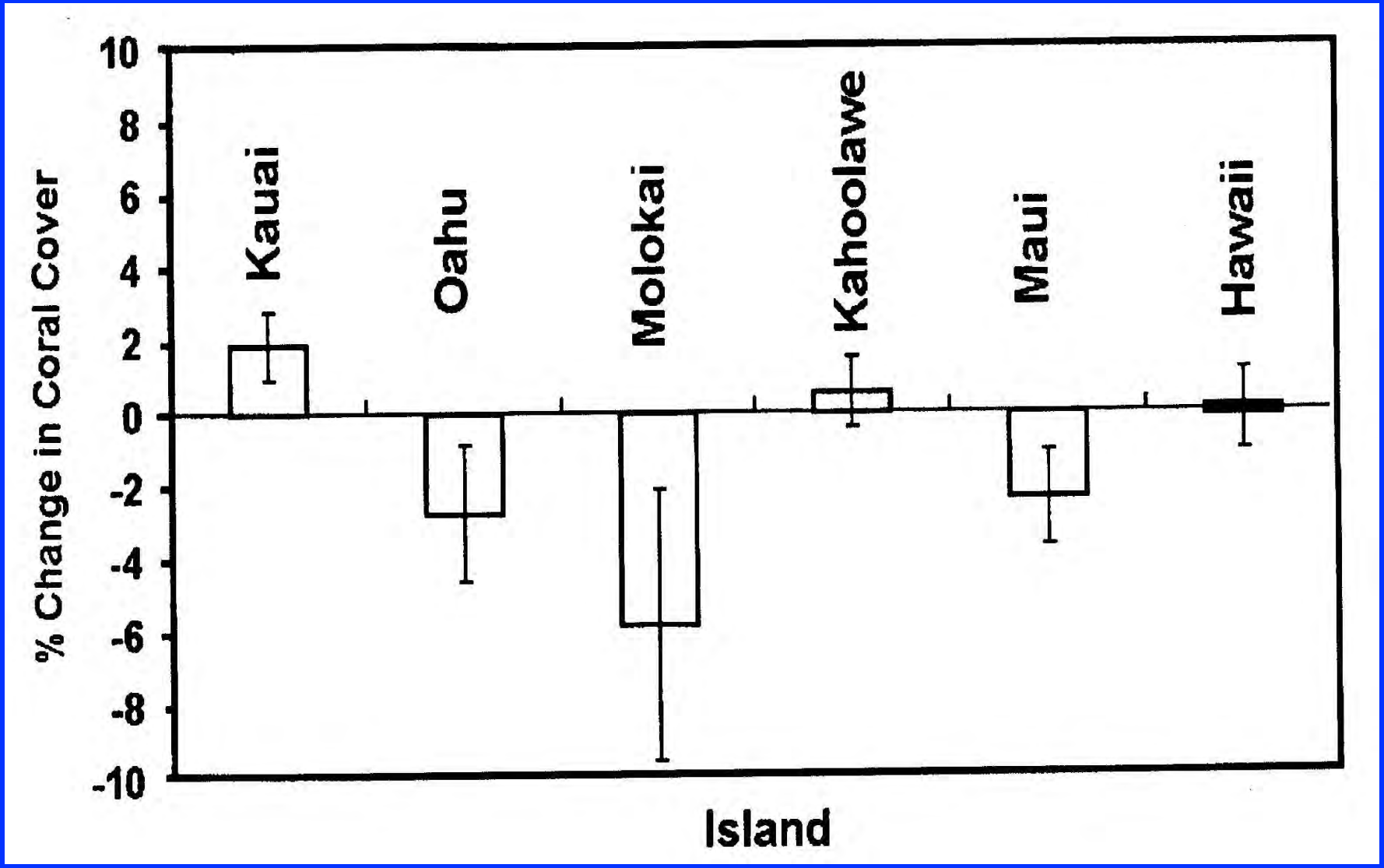
A decade of change in West Hawai ʻi

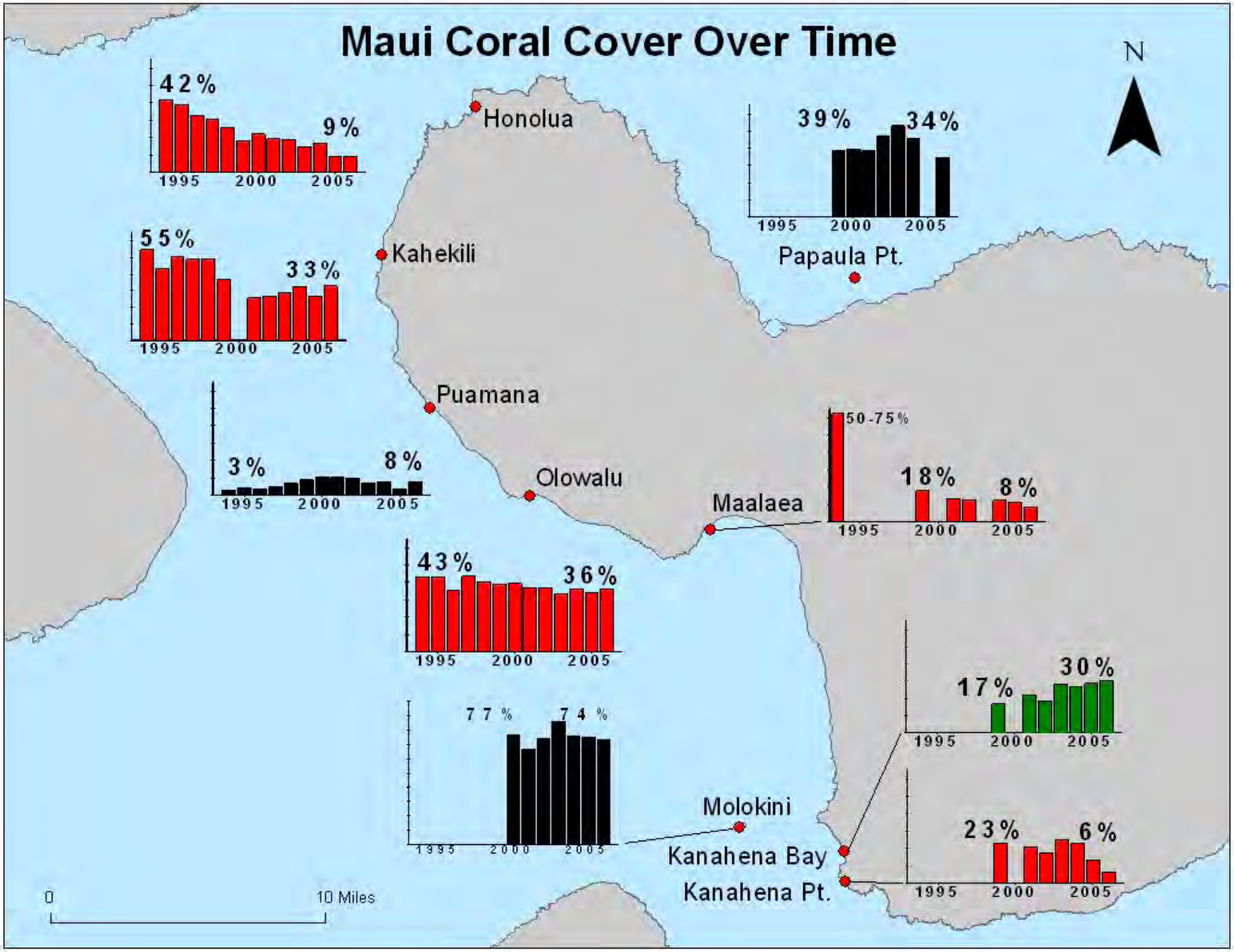
	Site/Year							
	Nenue 05m		Nenue 10m		Laaloa 3m		Laaloa10m	
Species	2000	2010	2000	2010	2000	2010	2000	2010
Anthelia edmondsoni	0.00	0.06	0.00	0.00	0.00	0.00	0.56	1.10
Leptastrea purpurea	0.60	0.08	0.00	0.00	0.30	0.00	0.00	0.00
Montipora capitata	0.00	4.44	0.50	2.82	0.10	0.30	0.41	2.86
Montipora flabellata	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Montipora patula	1.00	2.04	0.30	0.20	0.60	0.60	0.70	0.30
Montipora studeri	0.00	0.08	0.00	0.00	0.20	0.00	0.00	0.00
Pavona duerdeni	0.00	0.06	0.00	0.00	0.10	0.00	0.00	0.00
Pavona varians	0.00	0.00	0.00	0.02	0.10	0.00	0.06	0.00
Pocillopora meandrina	1.90	2.88	1.10	2.01	12.40	2.10	12.50	2.04
Porites compressa	0.10	0.04	2.30	3.49	0.00	1.70	0.00	3.02
Porites evermanni	0.00	0.08	1.40	0.75	0.00	0.00	0.00	0.74
Porites lobata	6.60	13.13	13.50	21.26	17.50	35.50	30.63	47.02
Total coral cover (%)	**10.2**	**22.9**	**19.1**	**30.6**	**31.3**	**40.2**	**44.9**	**57.1**
	12.7		11.5		8.9		12.2	
% increase	**124.5**		**59.9**		**28.4**		**27.2**	

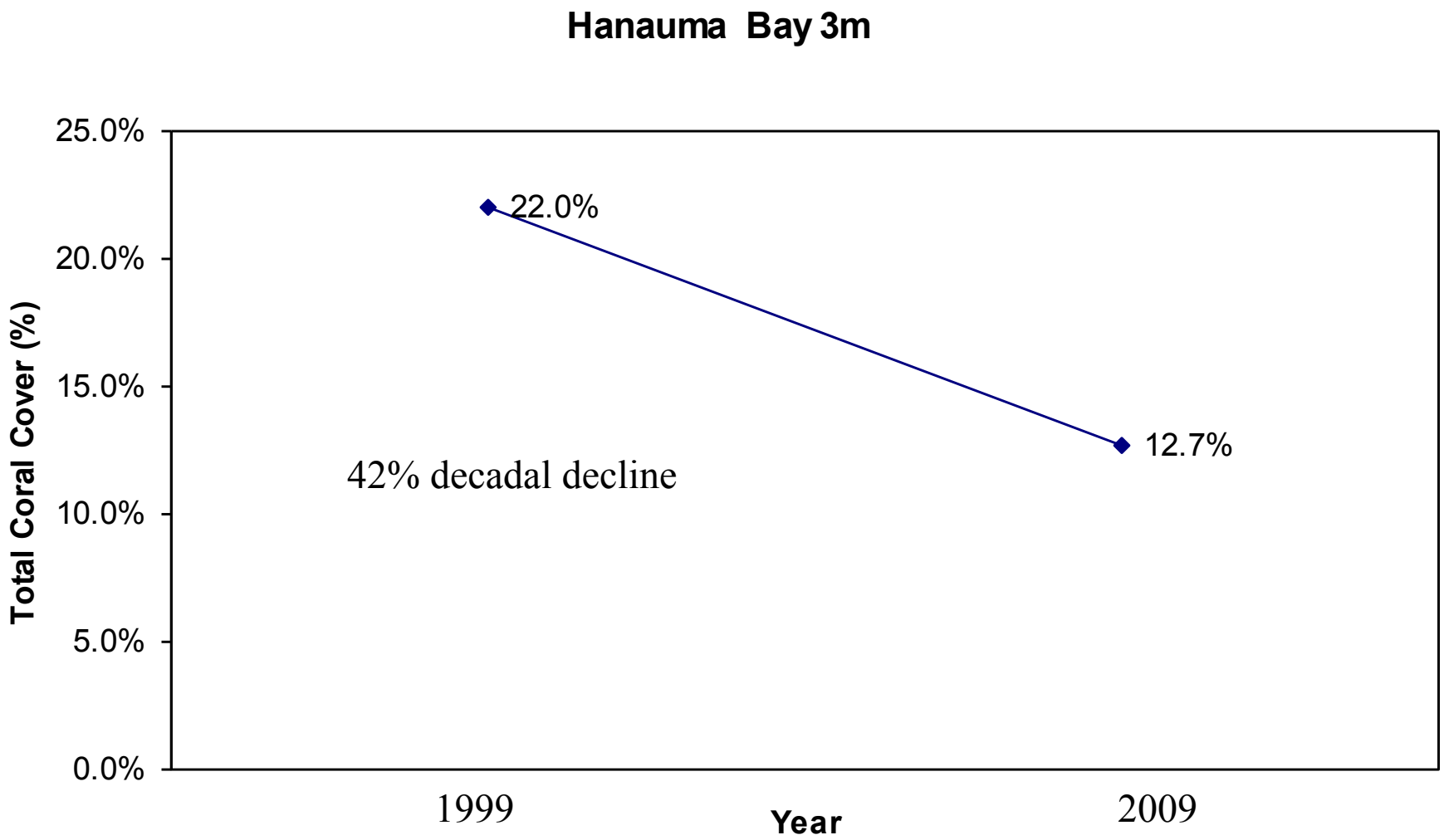

Pocillopora meandrina
Montipora capitata
Total Coral Cover
14
12
10
8
6
4
2
0
Nenue 05m
Nenue 10m
La'aloa 3m
La'aloa 10m
2000
2010



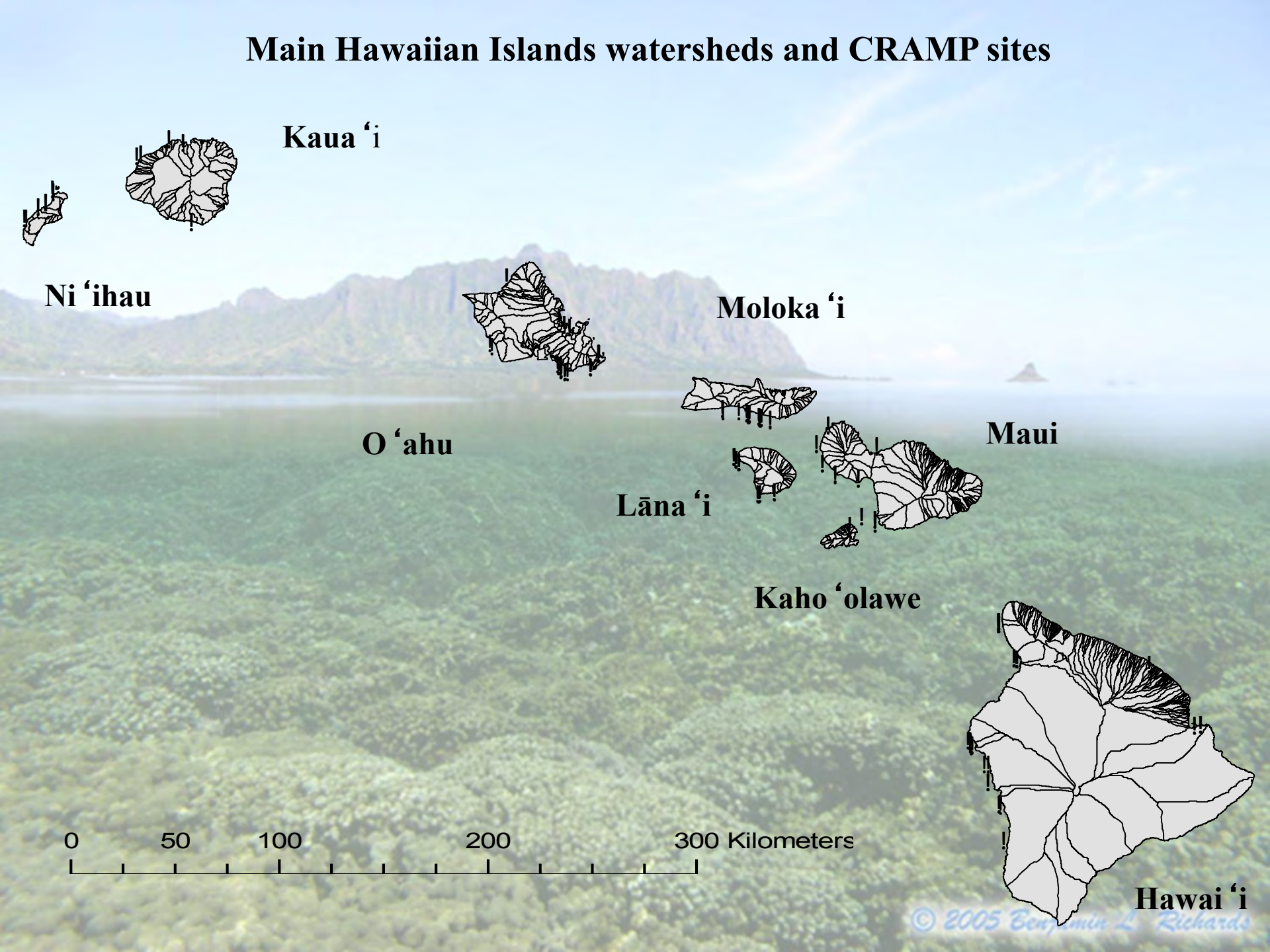

Porites lobata
Total Coral Cover
50
45
40
35
30
25
20
15
10
5
0
Nenue 05m
Nenue 10m
La'aloa 3m
La'aloa 10m
2000
2010

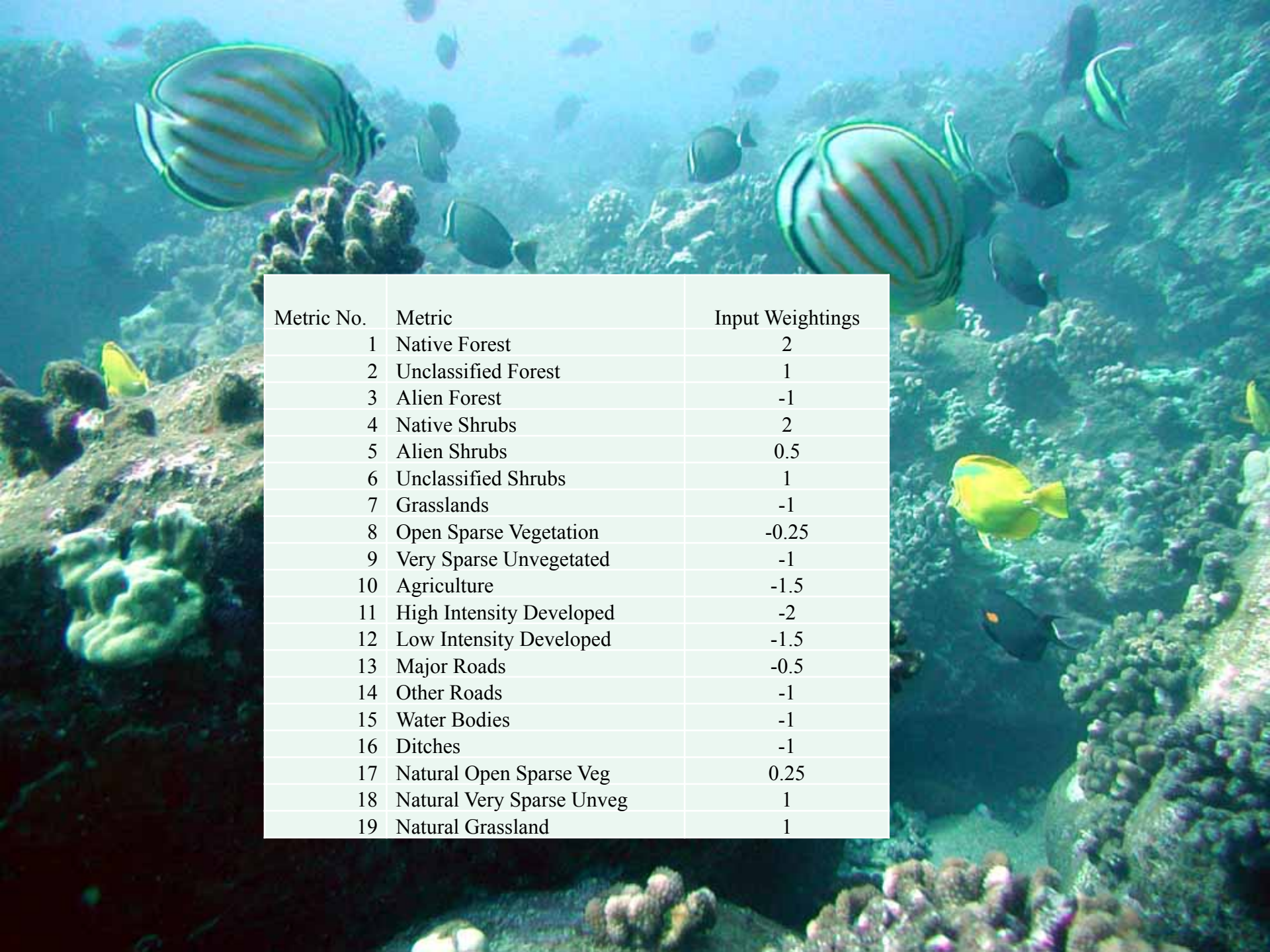

% Change in Coral Cover
10
8
6
4
2
0
-2
-4
-6
-8
-10
Kauai
Oahu
Molokai
Kahoolawe
Maui
Hawaii
Island


Maui Coral Cover Over Time
N
42%
9%
1995
2000
2005
Honolua
39%
34%
1995
2000
2005
Papaula Pt.
55%
33%
1995
2000
2005
Kahekili
Puamana
3%
8%
1995
2000
2005
Olowalu
Maalaea
50-75%
18%
8%
1995
2000
2005
43%
36%
1995
2000
2005
17%
30%
1995
2000
2005
77%
74%
1995
2000
2005
Molokini
Kanahena Bay
Kanahena Pt.
23%
6%
1995
2000
2005
0
10 Miles


Hanauma Bay 3m
25.0%
20.0%
15.0%
10.0%
5.0%
0.0%
Total Coral Cover (%)
22.0%
12.7%
42% decadal decline
1999
2009
Year

Main Hawaiian Islands watersheds and CRAMP sites

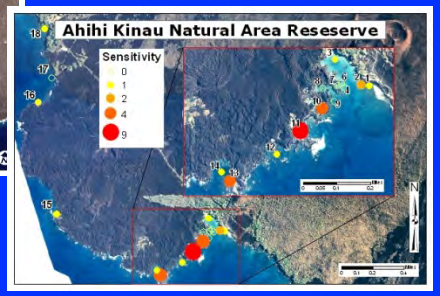




Metric No.	Metric	Input Weightings
1	Native Forest	2
2	Unclassified Forest	1
3	Alien Forest	-1
4	Native Shrubs	2
5	Alien Shrubs	0.5
6	Unclassified Shrubs	1
7	Grasslands	-1
8	Open Sparse Vegetation	-0.25
9	Very Sparse Unvegetated	-1
10	Agriculture	-1.5
11	High Intensity Developed	-2
12	Low Intensity Developed	-1.5
13	Major Roads	-0.5
14	Other Roads	-1
15	Water Bodies	-1
16	Ditches	-1
17	Natural Open Sparse Veg	0.25
18	Natural Very Sparse Unveg	1
19	Natural Grassland	1

Shallow south facing sites
positive partial correlation
0.95 ($p<0.001$)

North facing sites
no statistically significant correlation

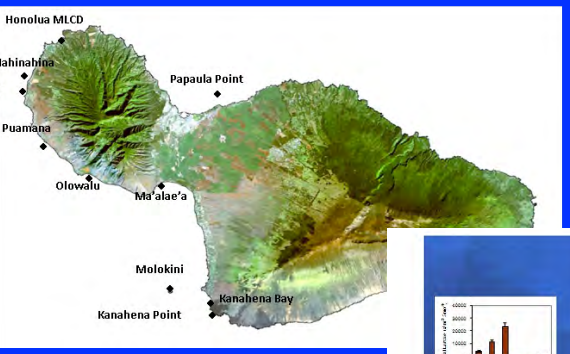


Utility of CRAMP Data

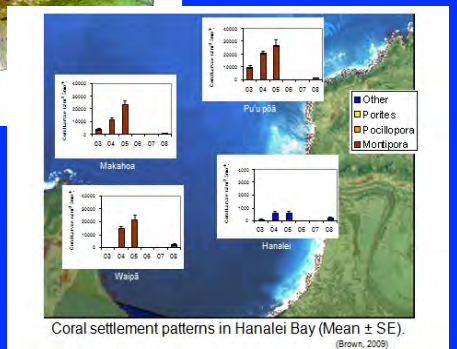
Facilitate management decisions
eg. NARs, DAR, EPA, KIRC, NOAA,FWS, USDA

Educational Research
eg. UH, HIMB, Boise Forestry Science, Reefbase

Support legal cases
eg. Pila ʻa, Hokulia, Waiahole water



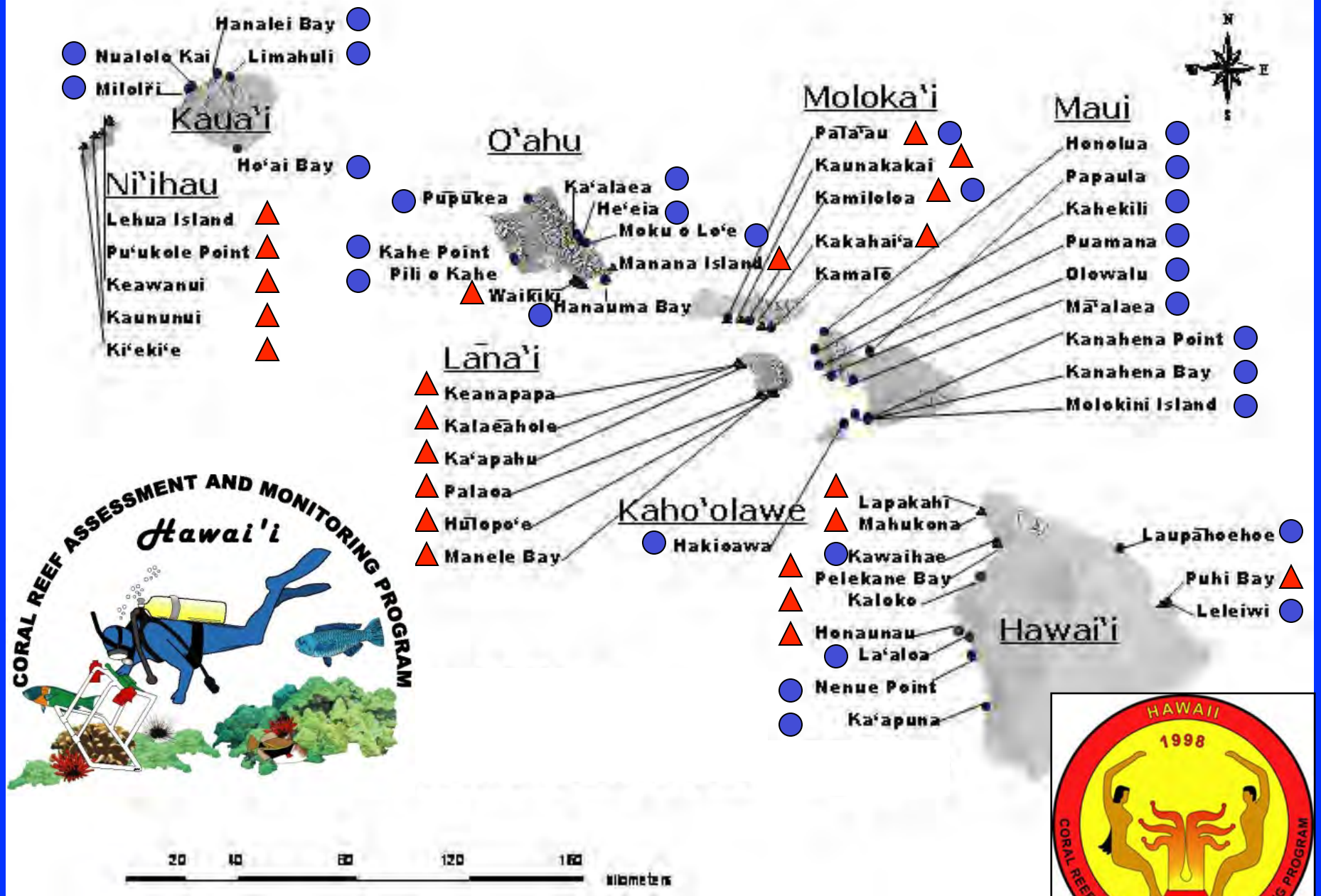
Environmental Impact statements
eg. artificial reefs, mooring pins, harbor modification



Coral settlement patterns in Hanalei Bay (Mean ± SE).
(Brown, 2009)

State of the Reef reports
eg. federal, state, regional

Specific site information
eg. NGOs, scientists, public, federal, state agencies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Kaloko
Honaunau
La'aloa
Nenue Point
Ka'apuna
Hawai'i
Laupāhoehoe
Puhi Bay
Leleiwi
N
E
S
CORAL REEF ASSESSMENT AND MONITORING PROGRAM
Hawai'i
20
40
60
120
160
kilometers
HAWAII
1998
CORAL REEF ASSESSMENT AND MONITORING PROGRAM