

# Nualolo Kai, Kauai

22° 09.641' N 159° 42.102' W

Management Status: Open Access, State Park.  
National and State Registered Historic Place.

Area Description: High steep cliffs surrounding narrow sand dune and talus valley with boulder/gravel beach. Tourist boat traffic and anchoring. Wide shallow reef flat with crest on NE end extending and narrowing to the SE. Reef appears to be a thin veneer of carbonates over an erosional pre-existing basalt foundation that has been highly modified by wave action. Coralline algae suggested principal reef building organisms. Broad reef platform extends farther offshore characterized by basaltic spur and groove features with low to moderate coral



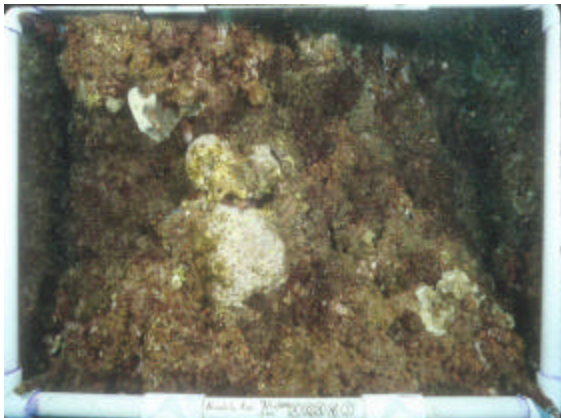
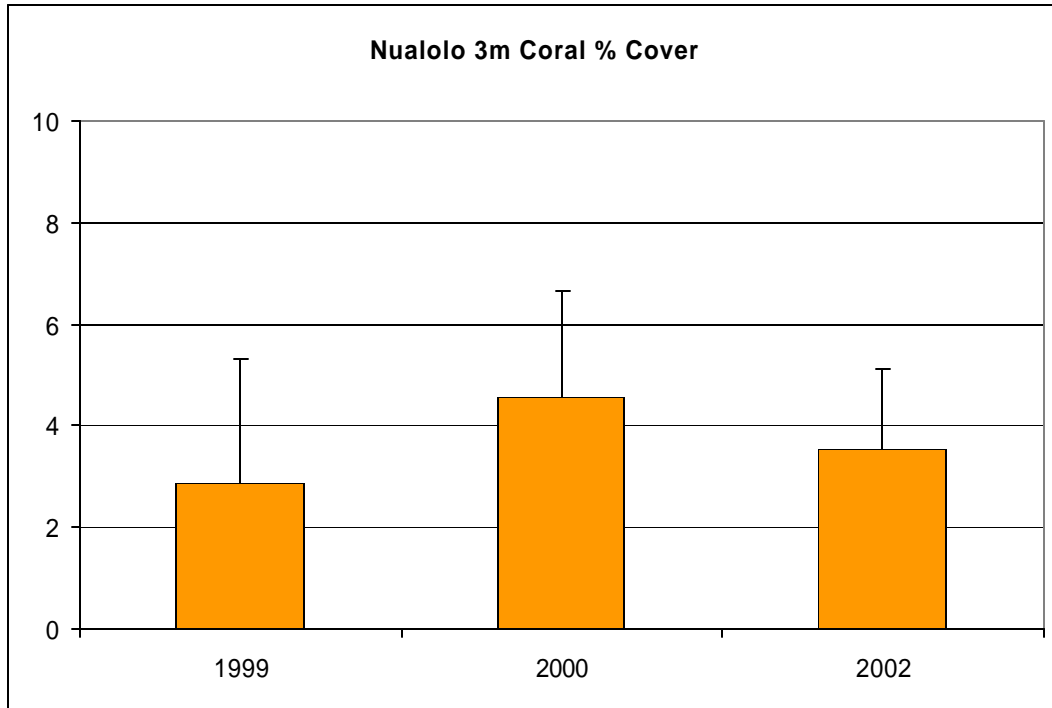
cover. Surge and sand channels present. North exposed site influenced by North Pacific swell and northeast trade wind waves.

## Benthic Habitat Data: 3 m

	Depth (m)	Rugosity	Sediment Composition (% wt.)		Sediment Grain Size (% wt.)			
			LOI	H <sub>2</sub> CO <sub>3</sub>	Gravel	Coarse	Fine	Silt
Mean	3	1.51	3.80	53.54	77.63	17.96	3.42	1.00
S.D.		0.12	0.25	1.63	5.64	8.62	2.08	0.90

## Video Transect data (3 m):

Species	% Cover:		1999		2000		2002	
	Mean	SD	Mean	SD	Mean	SD	Mean	SD
<i>Cyphastrea ocellina</i>	0	0	0	0	0	0	0	0
<i>Fungia scutaria</i>	0	0	0	0	0	0	0	0
<i>Leptastrea purpurea</i>	0	0	0	0	0	0	0	0
<i>Montipora flabellata</i>	0.0	0.1	0.7	1.0	0.1	0.3		
<i>Montipora patula</i>	1.0	1.8	1.5	1.1	1.1	0.8		
<i>Montipora studeri</i>	0	0	0.2	0.6	0	0		
<i>Montipora capitata</i>	0	0	0	0	0.1	0.2		
<i>Pavona duerdeni</i>	1.3	1.1	1.9	1.6	1.5	1.0		
<i>Pavona maldivensis</i>	0	0	0	0	0	0		
<i>Pavona varians</i>	0.2	0.5	0.1	0.1	0.3	0.5		
<i>Pocillopora damicornis</i>	0	0	0	0	0	0		
<i>Pocillopora eydouxi</i>	0	0	0	0	0	0		
<i>Pocillopora ligulata</i>	0	0	0	0	0	0		
<i>Pocillopora meandrina</i>	0.2	0.6	0.0	0.1	0.2	0.4		
<i>Porites brighami</i>	0	0	0.1	0.3	0	0		
<i>Porites compressa</i>	0.1	0.2	0.0	0.1	0.0	0.1		
<i>Porites evermanni</i>	0	0	0	0	0	0		
<i>Porites lichen</i>	0	0	0	0	0	0		
<i>Porites lobata</i>	0.1	0.1	0.2	0.2	0.2	0.4		
<i>Porites rus</i>	0	0	0	0	0	0		
<i>Psammocora nierstraszi</i>	0	0	0	0	0	0		
Unknown Coral	0.0	0.1	0	0	0.0	0.1		
<b>Total Coral</b>	<b>2.8</b>	<b>2.5</b>	<b>4.6</b>	<b>2.1</b>	<b>3.5</b>	<b>1.6</b>		
<b>Species Richness:</b>	<b>8</b>		<b>9</b>		<b>9</b>			
Macroalgae	11.8	6.3	1.8	2.5	22.2	9.7		



Photoquadrat Data (3 m): Photo analysis pending

Findings: Initial coral cover rank is 57 among 60 reefs. Coral cover stayed roughly the same between the 2 sampling periods. Moderate level of macroalgae (e.g. *Dictyota spp.*). High percentage of crustose coralline algae and turf algae. Low percentage of fine sediments with moderate content of terrigenous material in high wave energy environment. *Montipora studeri* not common at sites surveyed.

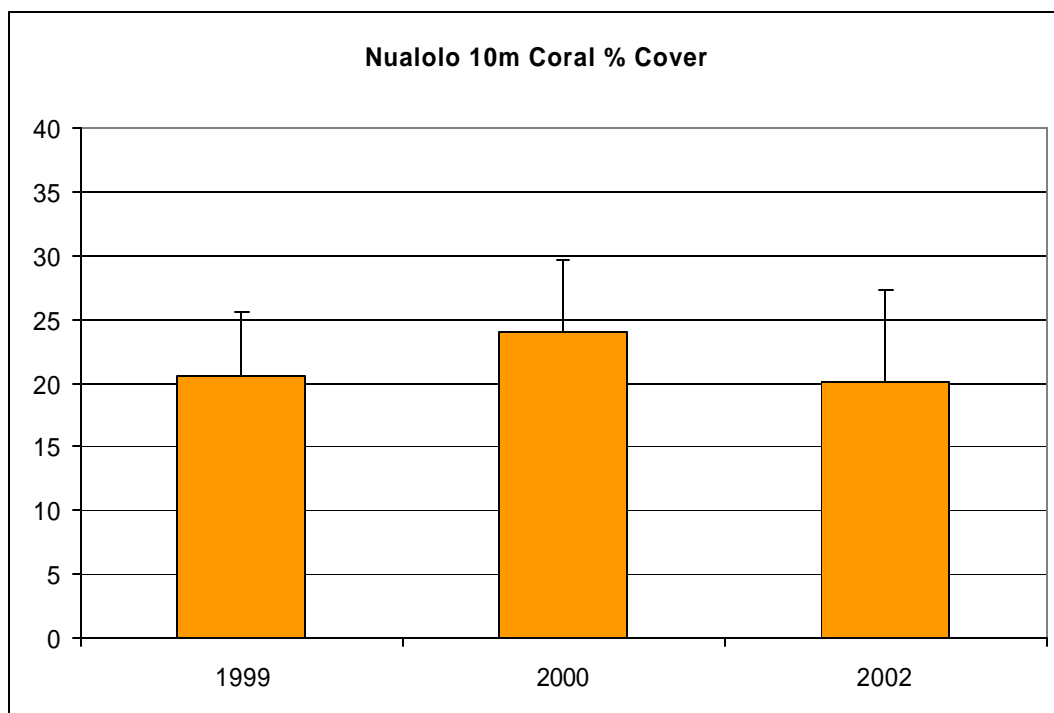
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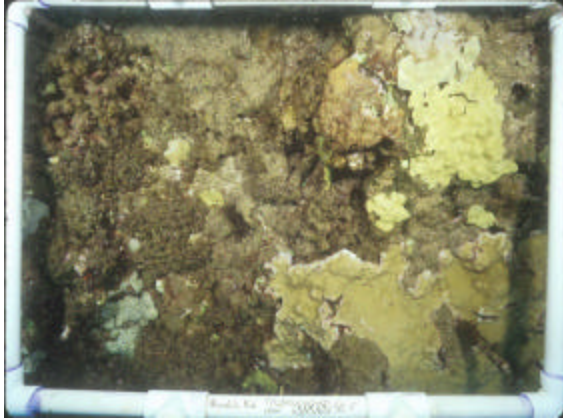
### Benthic Habitat Data: 10 m

	Depth (m)	Rugosity	Sediment Composition (% wt.)		Sediment Grain Size (% wt.)			
			LOI	H <sub>2</sub> CO <sub>3</sub>	Gravel	Coarse	Fine	Silt
Mean	10	1.47	3.70	92.60	98.51	0.77	0.59	0.13
S.D.		0.19	0.02	0.01	0.38	0.12	0.20	0.05

Video Transect data (10 m):

Species	% Cover:		1999		2000		2002	
	Mean	SD	Mean	SD	Mean	SD		
<i>Cyphastrea ocellina</i>	0	0	0	0	0	0		
<i>Fungia scutaria</i>	0	0	0	0	0.0	0.1		
<i>Leptastrea purpurea</i>	0	0	0	0	0.0	0.1		
<i>Montipora flabellata</i>	0	0	0.1	0.1	0.0	0.1		
<i>Montipora patula</i>	9.3	7.0	11.6	5.6	13.0	9.1		
<i>Montipora studeri</i>	0	0	0	0	0	0		
<i>Montipora capitata</i>	0	0	0.4	0.8	0.2	0.2		
<i>Pavona duerdeni</i>	0.4	0.6	0.5	0.7	0.5	0.5		
<i>Pavona maldivensis</i>	0	0	0	0	0	0		
<i>Pavona varians</i>	0.3	0.5	0.0	0.1	0.3	0.5		
<i>Pocillopora damicornis</i>	0	0	0	0	0	0		
<i>Pocillopora eydouxi</i>	0.5	0.8	0.3	0.7	0	0		
<i>Pocillopora ligulata</i>	0	0	0	0	0	0		
<i>Pocillopora meandrina</i>	0.9	0.9	1.6	1.4	0.9	1.1		
<i>Porites brighami</i>	0	0	0	0	0	0		
<i>Porites compressa</i>	0.5	0.5	0.8	0.9	0.4	0.6		
<i>Porites evermanni</i>	0	0	0	0	0	0		
<i>Porites lichen</i>	0	0	0	0	0	0		
<i>Porites lobata</i>	8.8	8.1	8.9	8.0	4.9	4.7		
<i>Porites rus</i>	0	0	0	0	0	0		
<i>Psammocora nierstraszi</i>	0	0	0	0	0	0		
Unknown Coral	0.0	0.1	0	0	0	0		
<b>Total Coral</b>	<b>20.7</b>	<b>5.0</b>	<b>24.1</b>	<b>5.5</b>	<b>20.2</b>	<b>7.1</b>		
<b>Species Richness:</b>	<b>8</b>		<b>9</b>		<b>10</b>			
Macroalgae	6.2	5.5	6.8	8.1	9.8	8.9		





Photoquadrat Data (10 m): Photo analysis pending

Findings: Initial coral cover rank is 30 among 60 reefs. Coral cover stayed roughly the same between the 2 sampling periods. Low level of macroalgae (e.g. *Dictyota* spp.). High percentage of crustose coralline algae and turf algae. Low percentage of fine sediments with low content of terrigenous material in high wave energy environment. No rare or unusual species observed.

## Nualolo Kai, Kauai Fish Data: 3 and 10 m

Species	Density (#/125m <sup>2</sup> )				Biomass (g/125m <sup>2</sup> )			
	3 m		10 m		3 m		10 m	
	Mean	SD	Mean	SD	Mean	SD	Mean	SD
<i>Acanthurus achilles</i>	1.5	1.9			193.1	258.3		
<i>Acanthurus leucopareius</i>	1.5	3.0	5.5	6.4	225.4	450.9	1379.8	1620.1
<i>Acanthurus nigrofuscus</i>	29.5	15.9	15.0	5.0	1064.5	541.5	538.6	163.3
<i>Acanthurus olivaceus</i>			1.0	2.0			156.1	312.2
<i>Anampses cuvier</i>			0.5	1.0			154.0	307.9
<i>Bodianus bilunulatus</i>			0.5	1.0			56.4	112.9
<i>Canthigaster amboinensis</i>			0.5	1.0			10.4	20.8
<i>Canthigaster jactator</i>			5.0	3.5			27.6	21.5
<i>Caranx melampygus</i>			2.5	5.0			949.6	1899.1
<i>Cephalopholis argus</i>			1.5	1.0			1169.9	944.3
<i>Chromis hanui</i>			1.0	2.0			1.5	3.0
<i>Chromis vanderbilti</i>	0.5	1.0	21.5	26.7	0.7	1.4	42.2	52.4
<i>Cirrhitus pinnulatus</i>	3.5	3.0	0.5	1.0	87.6	87.9	45.1	90.3
<i>Ctenochaetus strigosus</i>	7.5	8.2	2.5	5.0	592.1	658.3	176.8	353.5
<i>Gomphosus varius</i>	6.5	4.4	1.0	1.2	35.5	34.9	31.7	56.3
<i>Halichoeres ornatus</i>			2.5	1.0			29.2	16.4
<i>Kyphosus species</i>	1.0	2.0	3.5	4.4	167.2	334.4	613.9	878.6
<i>Labroides phthirophagus</i>			0.5	1.0			1.0	2.1
<i>Lutjanus kasmira</i>			2.5	3.8			318.1	501.8
<i>Macropharyngodon geoffroyi</i>			1.0	1.2			8.2	9.5
<i>Melichthys niger</i>	13.0	10.6			4313.2	3715.7		
<i>Mulloidichthys flavolineatus</i>			6.0	12.0			846.6	1693.3
<i>Naso lituratus</i>	2.0	4.0			404.4	808.8		
<i>Ostracion meleagris</i>			0.5	1.0			11.3	22.7
<i>Paracirrhites arcatus</i>			4.5	3.4			81.7	62.0
<i>Parupeneus bifasciatus</i>	1.0	1.2	0.5	1.0	4.6	5.6	12.1	24.2
<i>Parupeneus cyclostomus</i>	1.5	1.0	2.0	2.8	5.0	3.6	29.5	34.8
<i>Parupeneus multifasciatus</i>	1.0	1.2	1.0	2.0	35.3	64.1	3.9	7.9
<i>Parupeneus pleurostigma</i>			1.0	2.0			10.1	20.3
<i>Plagiotremus goslinei</i>	2.0	2.8	1.5	1.9	1.4	2.3	1.3	1.5
<i>Plectroglyphidodon imparipennis</i>	1.5	1.9			3.4	4.8		
<i>Plectroglyphidodon johnstonianus</i>	0.5	1.0	1.0	1.2	0.4	0.7	6.7	9.4
<i>Pseudocheilinus evanidus</i>			1.0	2.0			9.2	18.3
<i>Scarus rubroviolaceus</i>			0.5	1.0			318.7	637.5

<i>Rhinecanthus rectangulus</i>	1.5	1.0			158.8	107.4		
<i>Stegastes fasciolatus</i>	18.5	6.6	5.0	5.3	273.5	101.0	103.5	114.3
<i>Stethojulis balteata</i>	8.0	7.7			74.3	70.6		
<i>Thalassoma ballieui</i>	0.5	1.0	0.5	1.0	21.3	42.6	21.3	42.6
<i>Thalassoma duperrey</i>	55.0	13.5	23.5	11.1	760.0	199.0	278.1	143.8
<i>Thalassoma trilobatum</i>	0.5	1.0			23.6	47.2		
<b>Total/Depth Avg ± SD:</b>	<b>158.0</b>	4.3	<b>117.0</b>	3.7	<b>8445.5</b>	342.8	<b>7444.2</b>	309.0
<b>Species Richness</b>	<b>22</b>		<b>33</b>					
<b>Species Diversity</b>	<b>1.95</b>		<b>2.23</b>					

Findings: Among 60 reefs, Nualolo Kai 3m ranked 52 in species richness, 42 in density, 40 in biomass, and 48 in diversity. Nualolo Kai 10m ranked 42 in species richness, 48 in density, 42 in biomass, and 26 in diversity. The most abundant species was the Saddle wrasse (*Talassoma duperrey*) at both the 3m and 10m reefs respectively. The species with the highest biomass were the Black Durgon (*Melichthys niger*) and the Whitebar surgeonfish (*Acanthurus leucopareius*) at the 3m and 10m reefs respectively. *Pseudocheilinus evanidus* presence notable as this species is not common to sites surveyed.