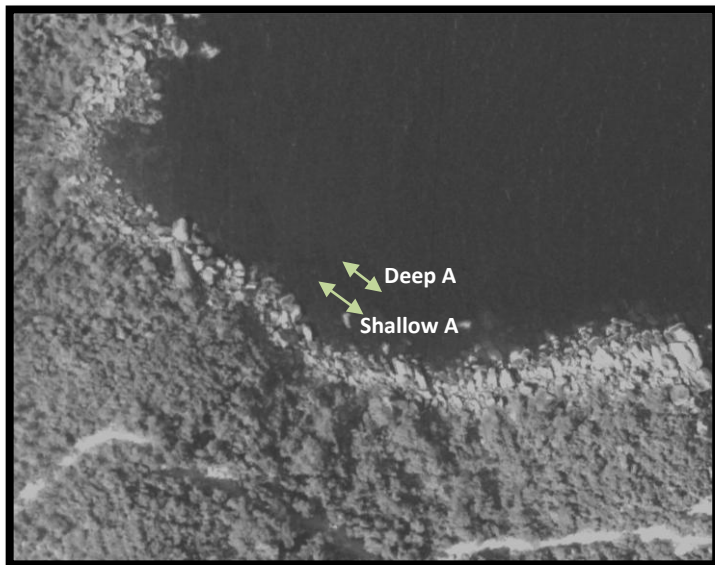


Bay Profile: Ao Mao

20 July 2011



Location – N 10° 05.563, E 099° 51.174

Ao Mao is located on the Eastern side of the island. The bay is quite secluded, but receives high wave activity during the monsoon season (as evidenced also by the high abundance of massive coral growth forms, and lack of branching or tabulate corals). There is no development in the direct vicinity of the bay, and only 1 road in the bay's watershed.

The bay has a rocky shoreline and no beach, and the reef exists primarily on the rocky substrate from sea level down to about 11 meters. The rocky reef has a high slope, provides excellent habitat for fish, but is quite narrow (approx 64 meters wide). The reef is very diverse, and contains a high relative abundance of coral recruits. The reef is dominated by *Diploastrea*, *Heliopora*, and has a low relative abundance of *Acropora* (no Branching *Acropora* were observed on the dive) or *Poriites*, compared with other sites around Koh Tao.

The leading threats observed affecting the reef was sedimentation and predation by the Crown of Thorns starfish. Over 9 COTS were observed during the course of the dive, feeding primarily on *Pavona*, *Montipora*, *Merulina*, and *Galaxea*. Areas along the reef edge appear to be inundated with sand, but an island based source could not be located in the immediate vicinity. There is a very low relative abundance of Macro-Algae or invertebrate grazers, indicating low nutrient levels and good water quality. Effects from the 2010 bleaching event appear to be low



relative to other areas around the island (possibly due to the low incidence of Pocillopora and Branching Acropora) The only species which appear heavily impacted by the 2010 event are Montipora squamosa (80-100% partial mortality of colonies [average = 90%]) and Lobophyllia (30-100% partial mortality of colonies surveyed [average = 24 %]), and Tabulate Acropora (60-100% partial mortality of colonies surveyed [average = 37%]).



Very few Drupella snails were found during the survey, with only 1 aggregation found on a porites coral containing 3 adults.

Disease incidence is very low, the only disease found was White plague, found on a single colony of Porites coral (about 20 cm max D). Although it is suspected that disease rates here have been substantially higher in the recent past as many colonies of porites show partial mortality which is more recent than the 2010 bleaching event. Of 14 colonies surveyed, only one was found to have no partial mortality (small colony less than 20cm Max D). The rest of the colonies had partial mortality rates ranging from 10-60% (average = 18%). This is congruent with Diseases studies conducted during January/February 2011 in which porites were found to have high incidence of White Plague, which declined by about mid-march 2011.

2 transect line surveys, plus a Line Intercept profile survey were conducted to establish baseline data on the reef area. Starting points were marked with small buoys to facilitate location on subsequent trips. The shallow line begins near the small rock island on the south side of the bay at a depth of 5 meters. The deep line can be found by following a heading 60 degrees to a depth of 9 meters.

Reef Profile

0-5 m depth (from shore to 26 meters from shore)

Rocky Reef with low coral coverage

RC	RB	HC	DC	SD	SI
70	5	20	5	0	0

5-6 m depth (26 to 36 meters from shore)

Rocky reef with high coral abundance and diversity

RC	RB	HC	DC	SD	SI
20	15	40	25	0	0

6-8 m depth (36 to 46 meters from shore)

'Diploastrea Reef' Rocky reef dominated by very large (>4m) Diploastrea corals

RC	RB	HC	DC	SD	SI
0	5	80	15	0	0

8-12 m depth (45 to 65 meters from shore)

Dense reef edge with high abundance and diversity of

corals (very high relative abundance of coral recruits)

RC	RB	HC	DC	SD	SI
0	14	60	20	5	1

Shallow line

The shallow line (5 meters depth) is heavily dominated by very large (>4 m Diameter) Diploastrea Heliopora colonies. Other genus/species of corals present include: Favidae (Goniastrea, fivites, Leptoria, platygyra), Lobophyllia, Symphyllia, Echniopora, Pacyseries, Montipora, Astreopora, porites, and Acropora. There is a high abundance of coral recruits on dead areas of the corals heads or rocks.

Deep line

The Deep line (9 meters depth) is heavily dominated by very large (>4 m Diameter) Diploastrea Heliopora colonies and Lobophyllia colonies. Other genus/species of corals present include: Favidae (Goniastrea, fivites, Leptoria, platygyra), Symphyllia, Echniopora, Pacyseries, Montipora, Astreopora, and Acropora. There is a high abundance of coral recruits on dead areas of the corals heads or rocks. The deep line began near the reef edge, went beyond the reef into the sand for the middle section, and ended on the reef area, Hard coral estimates for this line may be lower than in reality due to the line location.

Data

Invertebrates

	Boring Clam	Giant Clam	Crown of Thorns	Long-Spiked Black Sea Urchin	Marbled Sea Cucumber	Black Sea Cucumber	Orange-Spiked Sea Cucumber	Sea Cucumber - Other	Nudibranch - General	Flat Worm - General
Shallow	2.25	1	0.5	0	0	1.25	0	0	0	0
Deep	0.75	0.5	0	0	0	0.5	2.5	0	0	0

Off line there was a high abundance of COTs, and a low abundance of Drupella snails. There was also a low abundance of herbivores invertebrates such as sea urchins.

Fish

	Rays	Lined Butterfly	Eight-Banded Butterfly	Weibel's Butterfly	Copper-Banded Butterfly	Longfin Bannerfish	Eel - General	Grouper - > 30 cm	Grouper - < 30 cm	Parrotfish - > 20 cm	Parrotfish - < 20 cm	Rabbitfish - General	Snapper - General	Breasted Wrasse	Surgeonfish - General	Sweetlips - General	Triggerfish - General
Shallow	0	0.5	0	4.75	0	0.5	0	0	0	0.5	3.5	16	0	0.75	0	0	0
Deep	0	1.5	0.75	0	0	0	0	0	0.25	1.5	0.5	0	0	0	0	0.5	0

There were many diverse fishes seen off line as well, including a large school of barracuda, a large triggerfish, and 2 large lined butterfly fish.

Substrate

Substrate Types

	HC	SC	RKC	DC	SP	NIA	RC	RB	SD	SI	TR	OTH	U
Shallow	34.3%	0.0%	0.0%	0.0%	0.0%	0.0%	29.2%	18.2%	17.5%	0.0%	0.0%	0.7%	0.0%
Deep	21.9%	0.0%	0.0%	0.0%	0.0%	0.0%	18.8%	30.0%	29.4%	0.0%	0.0%	0.0%	0.0%

The lines have very high relative coral coverage, with almost no marco-algae. High relative amounts of Recently Killed Coral was observed off-line, almost entirely due to COTs feeding activity (mostly Pavona, Merulina, Montipora, and Pocillipora).

Coral Growth Forms

	B	C	D	E	F	L	M	R	S	T	U
Shallow	0.0%	5.1%	0.0%	6.1%	0.0%	0.0%	69.6%	0.0%	19.2%	0.0%	0.0%
Deep	0.0%	0.0%	0.0%	49.2%	0.0%	0.0%	25.2%	3.9%	21.6%	0.0%	0.0%

Due to high storm energy during the monsoon season, the site is dominated by Massive, Encrusting, Submassive growth forms and has almost a complete lack of more fragile branching, corymbose, or tabulate forms.

Health

	H	PBL	FBL	DC	BBD	YBD	WBD	RBD1	RBD2	PKS	U
Shallow	59.3%	19.6%	0.0%	21.2%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Deep	95.2%	4.8%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%

Corals in the area were very healthy, with only a few instances of pales coloration of disease (exception is recently killed corals due to COT predation)

Genus/Species

	ACRO	ASTREO	DIPLO	FAV	FUNG	GONIO	LOBO	MERU	MONTA	MONTI	OULO	PAV	POCI	POR
Shallow	0.0%	4.2%	44.5%	12.5%	0.0%	0.0%	26.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	12.8%
Deep	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

Thanks to Heike Schwermer, Lotte, and Annette for performing the surveys and collecting/entering data.

