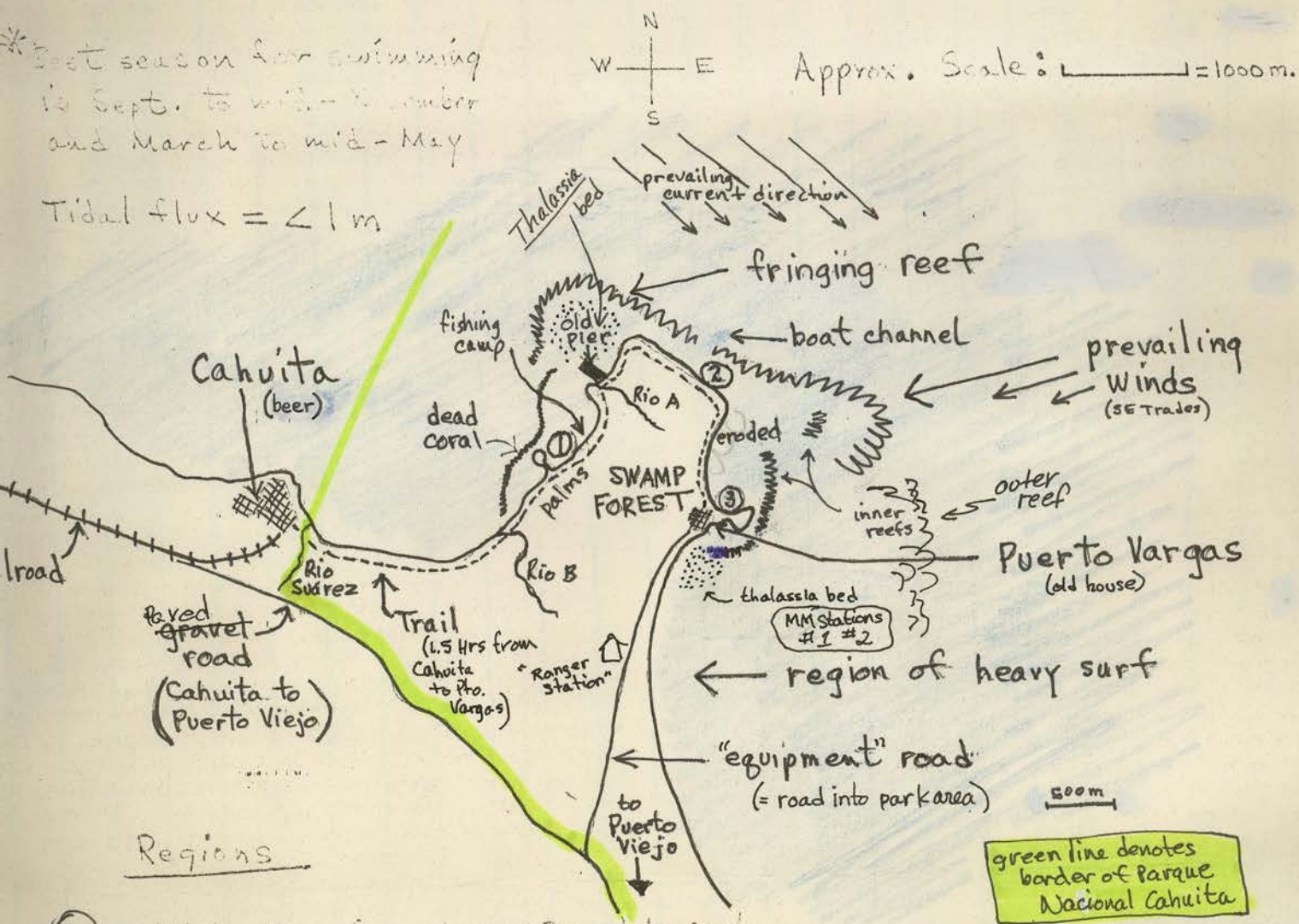


Punta Cahuita (Costa Rica - Caribbean side)

* Best season for swimming is Sept. to mid-December and March to mid-May

Tidal flux = < 1 m



Regions

- ① = Depth 150 m from shore = 2 m. Life corals lacking, due in part to discharge from rivers. Fishes poor. Thalassia = \varnothing . Large fan corals abundant 200 m. offshore.
- ② = $1\frac{1}{2}$ m deep. Thalassia abundant. Rich in invertebrates and fishes.
- ③ = deeper, more surge. Fishes more diverse and abundant. Lobsters common.

Rio A = Rio Perezoso

••••• = Thalassia

Turbidity

- ① = Turbid (visibility 5-10 m. in mid-October)
- ② = quite clear
- ③ = moderate clarity

Collections made on inner reef lagoon at Cahuita
Reef. Approx. $9^{\circ}45'N$ $82^{\circ}48'W$. Brusca, Wotzer, Delaney.

LACM 86-98

Collections 1-5: Subtidal algal & coral rubble seawater
washes, ~ 60 min, depth = 3-4 m. 3/4 April 1986.
 $H_2O T^{\circ} = 28^{\circ}C$ (500 m. from shore). Coll: R.C.
Brusca & P.M. Delaney. ~ $9^{\circ}45'N$ $82^{\circ}48'W$

LACM 86-99

Collection # 6: Same area. Underwater washes of
algae covered rocks, swept by plankton net.
~ 45 min. Same coordinates as above.

LACM 86-100

Collection #7: Same area. Brown algae washes
(mostly Sargassum).

LACM 86-102

Night light collection, 4 April 1986, ~ 300 m offshore,
drifting in Zodiac just after dark (1830-1930).
Coll: Wotzer, Delaney, Brusca Same coordinates
as above (collection #9)

LACM 86-101

Collection #8: Ocyropsis taken on shore.

April, 1986

LACM 86-103 Excursion to Monteverde, Reserva Biología del
: Bosque Nuboso de Monteverde. ca. $10^{\circ}18'N$ $84^{\circ}48'W$.

(Rio Guacinal)
7 April 1986. Isopods & insects collected under
logs in forest & freshwater ponds. Coll: R.C. Brusca,
R. Wetzer, P. Delaney. (also freshwater amphipods) (sample #10)

LACM 86-
Pacific Costa Rica, Guanacaste Prov., Ocotal (just
So. Playa Cocos). $\sim 10^{\circ}33'N$ $85^{\circ}44'W$. 8 April 1986.
Misc. inverts (no isopods) taken from littoral. Coll:
R.C. Brusca, R. Wetzer, P. Delaney. (sample #11)

Expedition #2
July 1986

Costa Rica, ~~Pacific~~^{Atlantic} Coast, Cahuita Region.
G. Hessler, R. Wetzer, M. Morillo, Jenaro A. Acuna (CIMAR chemist),
& Carlos Gamboa (CIMAR tech.).

LACM 86-109 7/26/86 Cahuita Coral Reef, inner reef flat. Snorkeling;
brown & green algae washes, under water with
plankton net. (sample #1)

LACM 86-110 7/26/86 Cahuita Coral Reef, inner reef flat. Snorkeling.
coralline algae washes into bucket (w/ net).
(sample #2)

LACM 86-118 7/27/86 Pt. Mona. Coral rubble wash over plankton
net, 4.5-11 m. OH breaking up coral w/ hammer.
(sample 3a)

LACM 86-119 7/27/86 Pt. Mona. Coralline algae wash; 7-8 m; washed
at surface. (sample 3b)

LACM 86-128 7/27/86 Pt. Viejo. Outer reef crest. Mostly Sargassum,
some coralline; 1 full plankton net collected from 6-11 m.
washed at surface in E+OH. (sample #4)

7/28/86 Cahuita Reef.

LACM 86-132 Cahuita, inner reef flat. Thalassia on coral rubble. One full plankton net of algal-Thalassia & rubble; washed at surface in EtOH. (2-4 m depth). (sample #5)

LACM 86-133 Cahuita, inner reef flat. 2 Crab traps set at MUM's stations at 3m & 9m. (set on 7/26, midday; baited w/sardines in oil, canned). (sample #6)

LACM 86-134 Cahuita, inner reef flat, coral rubble wash in 10m. (sample #4)

LACM 86-135 Cahuita, inner reef flat, MUM's station #1, night-light for 35 min. in rain (2300-2335 Hrs). (sample #8)

7/29/86

LACM 86-145 Cahuita, outer crest of inner reef, 7-8m. Sargassum collected in plankton net & washed at surface in EtOH. (sample #9)

July, 1986

LACM 86-148 7/30/86

Cahuita, outer reef crest; 14-16 m; sponge-covered coral rubble; poor visibility; rubble washed on bottom with plankton net. (Sample #10)

LACM 86-153 @ Cahuita, Thalassia bed between Pt. Vargas & Cahuita; 1/2 m - 2 m depth; plankton net dragged across bottom in grass. (Sample #11)

LACM 86-160 7/31/86

Pt. Viejo, inner reef (45-60 min. drive so. Cahuita); 0.5-1.5 m depth, 300-500 m from shore; mixed algae & rock scrapplings; collected in plankton net & washed at surface in formalin. (Sample #12)

<p>LACM 86-109</p> <p>1-3 m, brown/green algal wash, inner reef flat, Punta Cahuita Reef, Parque Nacional Cahuita, Limon Prov, Costa Rica (9°44.18'N, 82°48.7'W). Leg. Regina Wetzer, 26 JUL 1986. 186-109. #1</p>	<p>LACM 86-110</p> <p>1-3 m, coralline algal wash, inner reef flat, Punta Cahuita Reef, Parque Nacional Cahuita, Limon Prov, Costa Rica (9°44.18'N, 82°48.7'W). Leg. Regina Wetzer, 26 JUL 1986. 186-110. #2</p>	<p>LACM 86-118</p> <p>4.5-11 m, coral rubble washins, coral reef SE of small island, off Punta Mona (Pta. Carreta), Limon Prov, Costa Rica (9°37.90'N, 82°36.97'W). Leg. Regina Wetzer, 27 JUL 1986. 186-118. #3a</p>
Los Angeles Natural History Museum		
<p>LACM 86-119</p> <p>7-8 m, coralline algae, coral reef SE of small island, off Punta Mona (Pta. Carreta), Limon Prov, Costa Rica (9°37.90'N, 82°36.97'W). Leg. Regina Wetzer, 27 JUL 1986. 186-119. #3b</p>	<p>LACM 86-128</p> <p>6-11 m, coralline algae from Sargassum reef, outer crest of reef, N of Puerto Viejo, Limon Prov, Costa Rica (9°40.8'N, 82°45.53'W). Leg. Regina Wetzer, 27 JUL 1986. 186-128. #4</p>	<p>LACM 86-132</p> <p>2-4 m, Thalassia on coral rubble, shoaling seagrass flat, Punta Cahuita Reef, off Puerto Vargas, Limon Prov, Costa Rica (9°44.5'N, 82°48.68'W). Leg. Regina Wetzer, 28 JUL 1986. 186-132. #5</p>
Los Angeles Natural History Museum		
<p>LACM 86-133</p> <p>3-9 m, 48 hour duration crab traps, inner reef, Punta Cahuita Reef, Parque Nacional Cahuita, Limon Prov, Costa Rica (9°44.52'N, 82°48.37'W). Leg. Regina Wetzer, 28 JUL 1986. 186-133. #6</p>	<p>LACM 86-134</p> <p>10 m, coral rubble wash, inner reef, Punta Cahuita Reef, Parque Nacional Cahuita, Limon Prov, Costa Rica (9°44.52'N, 82°48.37'W). Leg. Regina Wetzer, 28 JUL 1986. 186-134. #7</p>	<p>LACM 86-135</p> <p>Night light collecting, inner reef, Punta Cahuita Reef, Parque Nacional Cahuita, Limon Prov, Costa Rica (9°44.52'N, 82°48.37'W). Leg. Regina Wetzer, 28 JUL 1986. 186-135. #8</p>
Los Angeles Natural History Museum		
<p>LACM 86-145</p> <p>7-8 m, Sargassum, outer crest of Inner Reef, Punta Cahuita Reef, off Puerto Vargas, Limon Prov, Costa Rica (9°44.18'N, 82°48.7'W). Leg. Regina Wetzer, 29 JUL 1986. 186-145. #9</p>	<p>LACM 86-148</p> <p>14-16 m, sponge covered coral rubble wash, outer crest of Outer Reef, Punta Cahuita Reef, off Puerto Vargas, Limon Prov, Costa Rica (9°44.0'N, 82°47.7'W). Leg. Regina Wetzer, 30 JUL 1986. 186-148. #10</p>	<p>LACM 86-153</p> <p>0.5-2 m, Thalassia bed, old pier, SW of Sloth River mouth, Punta Cahuita, Limon Prov, Costa Rica (9°44.7'N, 82°49.35'W). Leg. Regina Wetzer, 30 JUL 1986. 186-153. #11</p>
Los Angeles Natural History Museum		
<p>LACM 86-160</p> <p>0.5-1.5 m, algae and rock scrapings, 300-500 m from shore, inner reef, off Puerto Viejo, Limon Prov, Costa Rica (9°39.8'N, 82°45.53'W). Leg. Regina Wetzer, 31 JUL 1986. 186-160. #12</p>		
Los Angeles Natural History Museum		

Costa Rica, Atlantic coast, Cahuita area.

R.C. Brusca, P.M. Delaney, M.M. Marillo, Jenaro Acuña,
Carlos Gramboa, Jorge (CIMAR tech.), Bill Bullis (Weiler Ed.)

10/29/86. Pt. Vargas, Inner reef lagoon, R.C. Brusca &
P.M. Delaney. (Parque Nacional Cahuita)

LACM 86-196 Sample #1. Inner reef flat, 1-3 m. depth. Brown
algae washes. Approx. 15 min. (Delaney & Brusca
each fill one plankton net each). Some Sargassum,
but mostly other browns & a few Halimeda.

$9^{\circ}44.18'N, 82^{\circ}48.7'W$

LACM 86-197 Sample #2. Inner reef flat, 1-5 m depth,
coral rubble & stones turned over & washed
into plankton nets. ~20 min. of collecting.
Delaney & Brusca fill one plankton net each.

large brittle stars & Homotrypa
hand checked. $9^{\circ}44.18'N, 82^{\circ}48.7'W$

LACM 86-198 Sample #3. Inner reef flat/lagoon,
Thalassia bed near old pier, 1-5 m,
some coral rubble present & washed;
some Caulerpa. Aegids attacking Paul.

$9^{\circ}44.5'N, 82^{\circ}48.68'W$

LACM 86-199 Sample #4. Beach in front of Park station/residence,
sandy beach near high tide line. Isopods emerging
to munch on Paul Delaney's toes. $9^{\circ}44'N, 82^{\circ}48'W$

Oct., 1986

10/29/86 (cont.)

LACM 86-200 Sample #5. Large gravid ♀ crab taken on road in front of Cabinas Vaz, Cahuita. (Cardisoma sp.).
9°44'40" N 83°51' W

10/30/86 Pto. Vargas/Pto. Viejo area. R.C. Brusca & P.M. Delaney

LACM 86-201 Sample #6 Pto. Viejo, Thalassia bed on shore, .5-1 m depth. Thalassia and some other algae, including a thick carpet of fleshy stoloniferous green (blue-green?). Plankton nets scraped across surface of bed. Two ½ plankton net-falls.
9°39' N 82°45' W

LACM 86-202 Sample #7. Pto. Viejo. Algae washes in 1-8 m. on reef crest and outer face. Numerous species of algae, including many large reds. Algal clumps pulled off rocks & coral, including holdfasts when possible.
9°40'15" N 82°45' W

LACM 86-203 Sample #8. Pto. Vargas. Beach collection on sand in front of Park Administrator's house. Two Cecypode, one sand crab, several amphipods dug out of sand above water line.
9°44' N 82°48' W

10/31/86 Cahuita, reef in front of Parque,
 Brusca & Delaney, morning dives near M.
 Murillo's most shoreward habitat structure.
 Surface $T^{\circ} = 27^{\circ}C$, $10' = 27^{\circ}C$, $20' = 25^{\circ}C$.

LACM 86-204

Sample #9. Cahuita, Inner reef lagoon,
 isolated coral heads near M. Murillo's
 inner-most habitat. Live coral pieces taken,
 & later broken apart. Delaney & Brusca (2-4 m.)
 $9^{\circ}44.52'N$ $82^{\circ}48.37'W$

LACM 86-205

Sample #10. Cahuita, inner reef lagoon,
 plankton net washes of misc. algae, coral
 rubble & rocks near M. Murillo's most shoreward
 habitat. Brusca & Delaney. (4 bags) (2-7 m.)
 $9^{\circ}44.18'N$ $82^{\circ}48.7'W$

LACM 86-206

Sample #11. Cahuita, inner reef lagoon, two
 traps set for 24 hrs., one filled with
 tuna, the other with sardines in tomato
 sauce. Both nearly empty - contents eaten
 (or lost in surge?). No crustaceans
 noticed in traps. (2 m.) not so, plenty of ostracods
 + at least one isopod.
 $9^{\circ}44.52'N$ $82^{\circ}48.37'W$

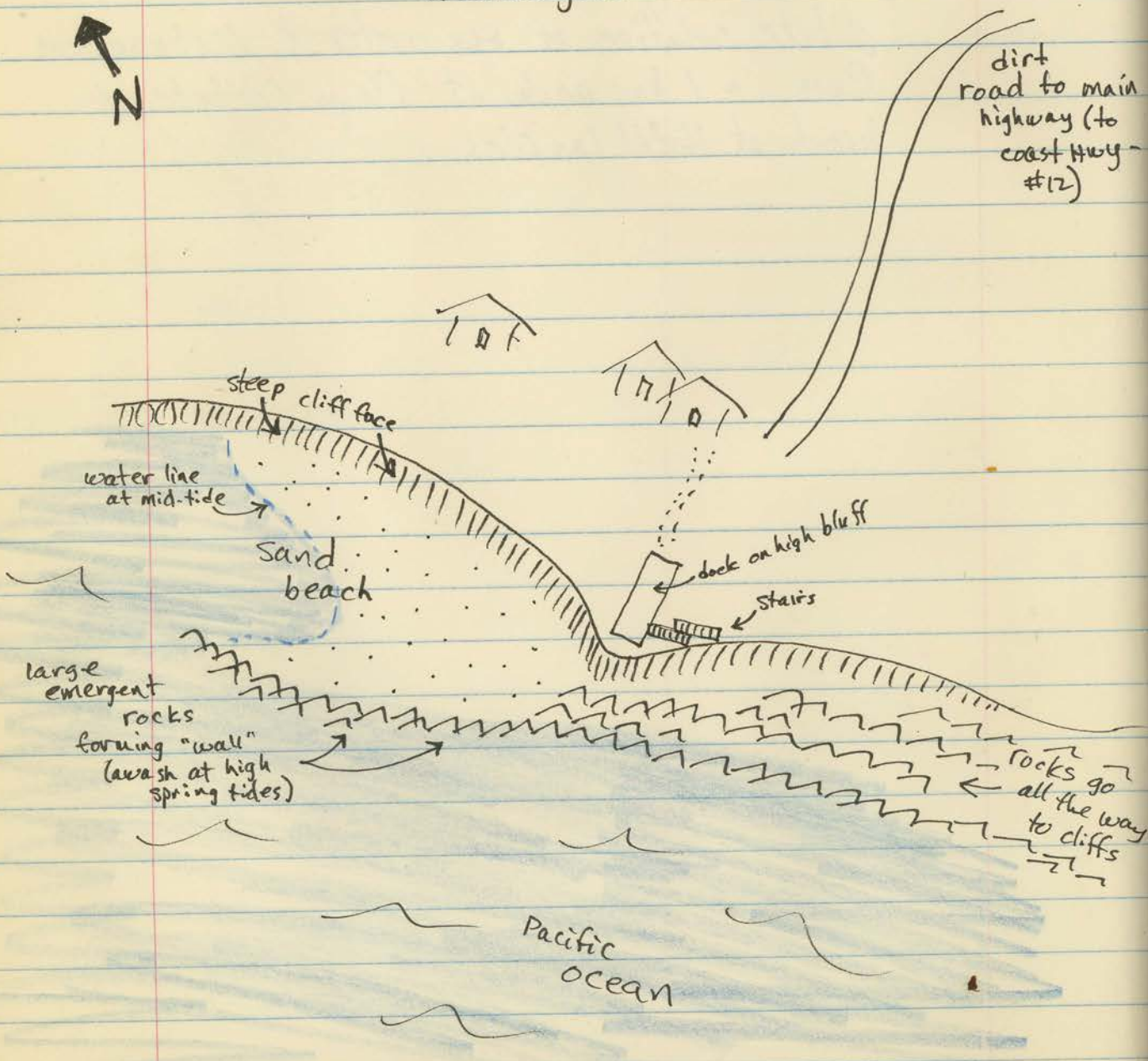
Oct. 1986

11/1/86 Pto. Limon area, Moin, Playa
Portete & beach at Hotel Las Olas.
Brusca & Delaney.

LACM 80-207

Sample #12. Algae covered rocks washed in
dilute solution of sea water & Matusalem
Rum. ~ 1 hr. each at Playa Portete &
beach at Hotel Las Olas, intertidal to 1m
10°00'30"N 83°02'W

Playa El Tránsito, Nicaragua



Expedition #4
Dec./Jan. 1986/87

Leon Province

LACM 86-247

Nicaragua, Playa El Velero, So. of Puerto Sandino (= Pto. Somoza) - approx. due west of Managua. 27 Dec. 1986. Rocky high intertidal; barren rocks, very little algae. Coll. R. Brusca & A.M. Mackey (accompanied by John Southerland & Sonia Ortega).

Leon Prov 12° 10' N 86° 45' W

to main way (to est Hwy - #12)

LACM 86-248

Nicaragua, Playa El Tránsito, ~30 mi so. Playa El Velero (so. of Pt. Sandino). 28 Dec. 1986. Rocky upper-mid intertidal, well protected region of basaltic outcroppings. Modest algae cover. Coll. R. Brusca & A.M. Mackey (accompanied by John Southerland & Sonia Ortega). 12° 10' N, 86° 45' W

Costa Rica, Limón Province, Parque Nacional Cahuita

Sample #1.

LACM 87-3

Cahuita, Pt. Vargas area, inner reef lagoon, 1-3 m depth. Algal washes. Approx. 40 min. (Wetzer & Brusca each fill one plankton net). Much Sargassum, other browns, greens, corallines, coralline greens, Caulerpa, etc. 9° 44.18' N 82° 48.7' W. 8 Jan. 1987.

cks go all the way to cliffs

Sample #2. Same area as sample #1. 1-12 m depth. Coral rubble washes. Brusca & Wetzer each "fill" plankton net (~30 min). Rubble with little or no macroscopic algae washed; sediment (and diatoms?) abundant on rubble. 8 Jan. 1987.
9°44.18'N, 82°48.7'W

Sample #3. Same area. 1-13 m depth. general collecting of rocks, rubble, algae, etc. large rocks & dead coral pieces turned & washed with plankton net. Wetzer hand collects ophiuroids for Dr. Gordon. 8 Jan. 1987.

Sample #4. Drift algae on shore washed in sea water for amphipods. 8 Jan. 1987. (Mostly Sargassum from recent storms 1-2 weeks ago).
9°44.18'N, 82°48.7'W

Sample #5. Skimming Thalassia bed of point; Brusca & Wetzer for ~20 min. .3-1 m depth. Two kinds of sea grass present (mixed) in bed: a typical broad-bladed Thalassia & a very narrow-bladed species (almost round-bladed). 8 Jan. 1987.
9°44'30"N, 82°4'22"W

Sample #6. : Same locality as sample #1 (at MMM station #1).

2ACM87-8

Two 8-gallon buckets of coral rubble collected, returned to Cabinas Vaz, and broken apart with a geology pick. 1-3 m. depth. Wetzer/Brusca.

8 Jan. 1986

9°44.18' N 82°48.7' W

General comments on Cahuita Reef. The reef is "healthier"-looking this trip than any of my previous trips (since April 1986). Although still heavily silted, there is more algae, superficially more variety of inverts, & perhaps more new small coral heads than I've noticed before. The visibility is also the best I've seen at Cahuita (8'-10'). Although there is evidence of recent storm activity, the sea was flat during these days. MMM is in a jolly good mood - at his best. From Xmas on (for several months) is the heavy tourist season in Costa Rica, coinciding with the start of the dry season - reservations for rooms & rental cars are a must.

Sample #7: Puerto Viejo, $9^{\circ}40'15''$ N $82^{\circ}45'$ W.
Collections on fore reef crest wall, &
along sand bottom-wall junction (same area
as sample #7 of October trip). Algae
modestly abundant, many gorgonians (mostly
Eunicea), surface texture highly rugose &
porous - breaks apart easily. No large
grazing herbivores seen (parrot fish, trigger
fish, etc.). Brusca/Wetzer dive for
 ~ 30 min., wash algae & scrape rock
surfaces with plankton nets - 1-6 m. depth.
9 Jan 1987.

WACM 87-9

Sample #8. Pto. Vargas - Cahuita - at MAM site #1
($9^{\circ}44.18'$ N $82^{\circ}48.7'$ W). Crustacea traps collected
in morning (9 Jan '87) after sitting out
overnight (16 hrs.). Two traps, one on
bottom, one ~ 1 m off bottom. Baited with
Tuna.

WACM 87-10

Sample #9. Same as #8, but trap tied ~ 1 m
below surface (~ 4 m. off bottom).
($9^{\circ}44.18'$ N $82^{\circ}48.7'$ W)

WACM 87-11

Limon Province

Sample #10. 10 Jan 1987. Puerto Limon area,
 : N. of town, between Hotel Las Olas &
 Hotel Matama, large tidepool (~100m X 20m)
 below abandoned hotel on main coast road.
 Tidepool with abundant Caulerpa (fernlike
 & grapelike species), Halimeda, & some odd
 reds & browns. shallow to 1m. depth.
 Brusca/Wetzer. Large lobster fishery
 off shore. Viva isopodos.

ACM 87-12

10°00.5' N, 83°02' W

Sample #11. 12 Jan. 1987 Pacific Coast, Puntarenas
 Prov., N. edge Parque Nacional Manuel Antonio
 (~10 km so. Quepos). Scuba collection at No.
 base of Pt. Cathedral, 10'-15'. Basaltic rocks
 on fine sand/mud substrate. Minimal algal
 cover. Gorgonians, Urchins, Phataria
pyramidata, Diadema mexicanum, purple
 solitary ascideans (common) - Rhopalium?
Pacificorgia sp., many grunt, - some
 parrotfish, small puffer fish. Visibility
 poor, ~10'. H₂O T° approx. 28°C.
 Rocks scrapped & washed into plankton
 nets. Brusca/Wetzer.

ACM 87-13

9°22' N 84°8' W

<p>LACM 86-196</p> <p>1-3 m, brown algal wash, inner reef flat, Punta Cahuita Reef, Parque Nacional Cahuita, Limon Prov, Costa Rica (9°44.18'N, 82°48.7'W). Leg. R.C. Brusca & P.M. Delaney, 29 OCT 1986. [86-196].</p> <p>Los Angeles Natural History Museum</p>	<p>LACM 86-197</p> <p>1-5 m, coral rubble and stone wash, inner reef flat, Punta Cahuita Reef, Parque Nacional Cahuita, Limon Prov, Costa Rica (9°44.18'N, 82°48.7'W). Leg. R.C. Brusca & P.M. Delaney, 29 OCT 1986. [86-197].</p> <p>Los Angeles Natural History Museum</p>	<p>LACM 86-198</p> <p>1-5 m, coral rubble wash, Thalassia bed near pier, inner reef flat, Punta Cahuita Reef, Parque Nacional Cahuita, Limon Prov, Costa Rica (9°44.5'N, 82°48.68'W). Leg. R.C. Brusca & P.M. Delaney, 29 OCT 1986.</p> <p>Los Angeles Natural History Museum</p>
<p>LACM 86-199</p> <p>0 m, sandy beach near high tide line, in front of park station, Parque Nacional Cahuita, Limon Prov, Costa Rica (9°44'N, 82°48'W). Leg. R.C. Brusca & P.M. Delaney, 29 OCT 1986. [86-199].</p> <p>Los Angeles Natural History Museum</p>	<p>LACM 86-200</p> <p>Elev 0 m, on road, in front of Cabinas Vaz, Cahuita, Limon Prov, Costa Rica (9°44.7'N, 83°51'W). Leg. R.C. Brusca & P.M. Delaney, 29 OCT 1986. [86-200].</p> <p>Los Angeles Natural History Museum</p>	<p>LACM 86-201</p> <p>0.5-1 m, Thalassia and algae, Puerto Viejo, Limon Prov, Costa Rica (9°39'N, 82°45'W). Leg. R.C. Brusca & P.M. Delaney, 30 OCT 1986. [86-201].</p> <p>Los Angeles Natural History Museum</p>
<p>LACM 86-202</p> <p>1-8 m, algae and algae holdfasts wash, on outer reef crest, Puerto Viejo, Limon Prov, Costa Rica (9°40.3'N, 82°45'W). Leg. R.C. Brusca & P.M. Delaney, 30 OCT 1986. [86-202].</p> <p>Los Angeles Natural History Museum</p>	<p>LACM 86-203</p> <p>0 m, sandy beach near high tide line, in front of park station, Puerta Vargas, Parque Nacional Cahuita, Limon Prov, Costa Rica (9°49'N, 82°48'W). Leg. R.C. Brusca & P.M. Delaney, 30 OCT 1986. [86-203].</p> <p>Los Angeles Natural History Museum</p>	<p>LACM 86-204</p> <p>2-4 m, isolated coral heads, inner reef lagoon, Punta Cahuita Reef, Parque Nacional Cahuita, Limon Prov, Costa Rica (9°44.52'N, 82°48.37'W). Leg. R.C. Brusca & P.M. Delaney, 31 OCT 1986. [86-204].</p> <p>Los Angeles Natural History Museum</p>
<p>LACM 86-205</p> <p>2-7 m, algae, coral rubble, & rock wash, inner reef lagoon, Punta Cahuita Reef, Parque Nacional Cahuita, Limon Prov, Costa Rica (9°44.18'N, 82°48.7'W). Leg. R.C. Brusca & P.M. Delaney, 31 OCT 1986.</p> <p>Los Angeles Natural History Museum</p>	<p>LACM 86-206</p> <p>2 m, crab traps, Inner reef lagoon, Punta Cahuita Reef, Parque Nacional Cahuita, Limon Prov, Costa Rica (9°44.52'N, 82°48.37'W). Leg. R.C. Brusca & P.M. Delaney, 31 OCT 1986. [86-206].</p> <p>Los Angeles Natural History Museum</p>	<p>LACM 86-207</p> <p>Intertidal-1 m, algae covered rock wash, Playa Portete and beach at Hotel Las Olas, Puerto Limon, Limon Prov, Costa Rica (10°00.5'N, 83°02'W). Leg. R.C. Brusca & P.M. Delaney, 1 NOV 1986. [86-207].</p> <p>Los Angeles Natural History Museum</p>

Expedition #10
Aug. 18-22, 1987

LACM 86-247

Intertidal, rocky, Playa El Velero, S. of Puerto Sandino (= Pto. Somoza), Pacific coast, Leon Dept, Nicaragua (12°10'N, 86°45'W). Leg. R. Brusca, A.M. Mackey, 27 DEC 1986. [86-247].

LACM 86-248

Intertidal, rocky, Playa El Transito, 30 mi. S of El Velero, Pacific coast, Leon Dept, Nicaragua (12°10'N, 86°45'W). Leg. R. Brusca, A.M. Mackey, 28 DEC 1986. [86-248].

LACM 87-3

1-3 m, algal washes, inner reef lagoon Pto. Vargas, Parque Nacional Cahuita, Atlantic coast, Limon Prov, Costa Rica (9°44.18'N, 82°48.7'W). Leg. R. Brusca & R. Wetzer, 8 JAN 1987. [87-3].

Los Angeles Natural History Museum + Los Angeles Natural History Museum + Los Angeles Natural History Museum +

LACM 87-4

1-12 m, coral rubble washes, inner reef lagoon, Pto. Vargas, Parque Nacional Cahuita, Atlantic coast, Limon Prov, Costa Rica (9°44.18'N, 82°48.7'W). Leg. R. Brusca & R. Wetzer, 8 JAN 1987. [87-4].

LACM 87-5

1-13 m, rock, coral rubble, algae washes, inner reef lagoon, Pto. Vargas, Parque Nacional Cahuita, Atlantic coast, Limon Prov, Costa Rica (9°44.18'N, 82°48.7'W). Leg. R. Brusca & R. Wetzer, 8 JAN 1987.

LACM 87-6

Intertidal, shore drift algae washes, Pto. Vargas area, Parque Nacional Cahuita, Atlantic coast, Limon Prov, Costa Rica (9°44.18'N, 82°48.7'W). Leg. R. Brusca & R. Wetzer, 8 JAN 1987. [87-6].

Los Angeles Natural History Museum + Los Angeles Natural History Museum + Los Angeles Natural History Museum +

LACM 87-7

Intertidal-1 m, skimming *Thalassia* bed off point, inner reef lagoon, Pto. Vargas area, Parque Nacional Cahuita, Atlantic coast, Limon Prov, Costa Rica (9°44.5'N, 82°48.37'W). Leg. R. Brusca &

LACM 87-8

1-3 m, coral broken & rubble washed, inner reef lagoon, Pto. Vargas area, Parque Nacional Cahuita, Atlantic coast, Limon Prov, Costa Rica (9°44.18'N, 82°48.7'W). Leg. R. Brusca & R. Wetzer, 8 JAN 1987. [87-8].

LACM 87-9

1-6 m, algae & gorgonians washed, fore reef crest & along sand bottom junction, Puerto Viejo, Atlantic coast, Limon Prov, Costa Rica (9°40.3'N, 82°45'W). Leg. R. Brusca & R. Wetzer, 9 JAN 1987. [87-9].

Los Angeles Natural History Museum + Los Angeles Natural History Museum + Los Angeles Natural History Museum +

LACM 87-10

4-5 m, Crustacea traps baited with tuna, inner reef lagoon, Pto. Vargas area, Parque Nacional Cahuita, Atlantic coast, Limon Prov, Costa Rica (9°44.18'N, 82°48.7'W). Leg. R. Brusca & R. Wetzer, 9 JAN 1987.

LACM 87-11

1 m, Crustacea trap baited with tuna, inner reef lagoon, Pto. Vargas area, Parque Nacional Cahuita, ~~Pacific~~ Atlantic coast, Limon Prov, Costa Rica (9°44.18'N, 82°48.7'W). Leg. R. Brusca & R. Wetzer, 9 JAN 1987. [87-11].

LACM 87-12

Intertidal-1 m, large tidepool with *Caulerpa* & *Halimeda*, between Hotel Las Olas and Hotel Matama, N of Puerto Limon, Atlantic coast, no locality (10°00.5'N, 83°02'W). Leg. R. Brusca, R. Wetzer,

Los Angeles Natural History Museum + Los Angeles Natural History Museum + Los Angeles Natural History Museum +

LACM 87-13

3-5 m, basaltic rocks on fine silt substrate, N base of Pt. Cathedral, 10 km S of Quepos, Parq. Nac. Manuel Antonio, Pacific, Puntarenas Prov, Costa Rica (9°22'N, 84°08'W). Leg. R. Brusca, R. Wetzer, 12 JAN 1987.

Los Angeles Natural History Museum + Los Angeles Natural History Museum + Los Angeles Natural History Museum +

Mix. bed of algae washes
upper part by 20m deep bed (near 21)
(8 point) This was a good sample

Station Data from expedition #5: Hendler & Peck

LACM 87-44

1-3 m, algae, on and shoalward of inner reef crest, Punta Cahuita Reef, off Puerto Vargas, Limon Prov., Costa Rica (9 44.18'N, 82 48.7'W)
Coll. G. Hendler & R. W. Peck (CR-87-5)
20 May 1987

LACM 87-45

1-3 m, coral rubble, on and shoalward of inner reef crest, Punta Cahuita Reef, off Puerto Vargas, Limon Prov., Costa Rica (9 44.18'N, 82 48.7'W)
Coll. G. Hendler & R. W. Peck (CR-87-6)
20 May 1987

LACM 87-46

1-3 m, live coral, on and shoalward of inner reef crest, Punta Cahuita Reef, off Puerto Vargas, Limon Prov., Costa Rica (9 44.18'N, 82 48.7'W)
Coll. G. Hendler & R. W. Peck (CR-87-7)
20 May 1987

LACM 87-47

1-2 m, Thalassia, reef flat shoalward of "Acroporita", Punta Cahuita Reef, off Puerto Vargas, Limon Prov., Costa Rica (9 44.37'N, 82 48.70'W)
Coll. G. Hendler & R. W. Peck (CR-87-8)
20 May 1987

LACM 87-48

1-3 m, coral rubble, reef flat shoalward of "Acroporita", Punta Cahuita Reef, off Puerto Vargas, Limon Prov., Costa Rica (9 44.37'N, 82 48.70'W)
Coll. G. Hendler & R. W. Peck (CR-87-10)
20 May 1987

LACM 87-58

1 m, rubble and sand, shoalward of inner reef, Punta Cahuita Reef, off Puerto Vargas, Limon Prov., Costa Rica (9 44.5'N, 82 48.68'W)
Coll. G. Hendler & R. W. Peck (CR-87-20)
21 May 1987

LACM 87-65

0-1 m, Thalassia, shoalward of inner reef crest, Punta Cahuita Reef, off Puerto Vargas, Limon Prov., Costa Rica (9 44.70'N, 82 48.68'W)
Coll. G. Hendler & R. W. Peck (CR-87-27)
23 May 1987

LACM 87-44

1-3 m, algae, on and shoalward of inner reef crest, Punta Cahuita Reef, off Puerto Vargas, Limon Prov., Costa Rica (9 44.18'N, 82 48.7'W)
Coll. G. Hendler & R. W. Peck (CR-87-5)
20 May 1987

LACM 87-45

1-3 m, coral rubble, on and shoalward of inner reef crest, Punta Cahuita Reef, off Puerto Vargas, Limon Prov., Costa Rica (9 44.18'N, 82 48.7'W)
Coll. G. Hendler & R. W. Peck (CR-87-6)
20 May 1987

LACM 87-46

1-3 m, live coral, on and shoalward of inner reef crest, Punta Cahuita Reef, off Puerto Vargas, Limon Prov., Costa Rica (9 44.18'N, 82 48.7'W)
Coll. G. Hendler & R. W. Peck (CR-87-7)
20 May 1987

LACM 87-47

1-2 m, Thalassia, reef flat shoalward of "Acroporita", Punta Cahuita Reef, off Puerto Vargas, Limon Prov., Costa Rica (9 44.37'N, 82 48.70'W)
Coll. G. Hendler & R. W. Peck (CR-87-8)
20 May 1987

LACM 87-48

1-3 m, coral rubble, reef flat shoalward of "Acroporita", Punta Cahuita Reef, off Puerto Vargas, Limon Prov., Costa Rica (9 44.37'N, 82 48.70'W)
Coll. G. Hendler & R. W. Peck (CR-87-10)
20 May 1987

LACM 87-58

1 m, rubble and sand, shoalward of inner reef, Punta Cahuita Reef, off Puerto Vargas, Limon Prov., Costa Rica (9 44.5'N, 82 48.68'W)
Coll. G. Hendler & R. W. Peck (CR-87-20)
21 May 1987

LACM 87-65

0-1 m, Thalassia, shoalward of inner reef crest, Punta Cahuita Reef, off Puerto Vargas, Limon Prov., Costa Rica (9 44.70'N, 82 48.68'W)
Coll. G. Hendler & R. W. Peck (CR-87-27)
23 May 1987

19 Aug. 1987

Cahuita National Park, Pto. Vargas area.

Collections made in area near M. Morillo's station #1. Moderately high waves & much rain have reduced visibility to near zero this trip. Although today is good weather, the previous few weeks have been very wet. The area between MMH sta. #1 and the Thalassia bed/inner reef was best (~8" visibility); the rest of the area was very bad (~1" visibility) so we avoided it. H₂O T° ~ 3' from surface = 30°C.

Collectors: R.C. Brusca, R. Wetzer, Giovanni Bassey (a student at U.C.R. & Morillo's assistant at CIMAR). Joe DeVita along for the ride & cheap thrills.

LACM 87-155
9° 44.18' N
82° 48.4' W

Sample #1. Algae washes in 3'-10'. Mostly Sargassum & a Halimeda. Washed into plankton nets underwater, for ~30 min. (Brusca & Wetzer @ with a net.)

LACM 87-156 Sample #2. Coral rubble washes in 3'-10'. Brusca & Wetzer each with a net for ~30 min.

LACM 87-157 Sample #3. Coral rubble collection, broken apart with hammer at cabins; ~5 gallons of rubble.

9° 44.37' N
82° 48.70' W

LACM 87-158 Sample #4. Misc. rock & algae wash near shore, inside inner reef by Thalassia bed (near "old house" on S. side of point.) This was a good sample

and contained numerous isopods and small crabs, including swimming crabs & a Rocinela that was biting Brusca's leg (~1cm. long).

LACM
87-159

Sample #5. Coenobita collected near "Ranger Station" by Joe DeVita.

LACM 87-160

Sample #6. "Cand" crabs collected on road to station. Giovanni identified them as Geotice lateralis. (This sample not labeled as "sample 6", but simply as "Cahuita, etc."). Bright brick red carapace.

LACM 87-161

Sample #7. Millipede from lawn at Cabinas Vaz, Cahuita. (same as I collected at Monteverde years ago? Identified by Hogue).

Day ended w/ 2.5 hrs. of sample processing at Cabinas. DeVita broke apart most of the rubble. No rain today - a few mosquitos tonight, but not bad. DeVita saw pack of howler monkeys today near end of park road. Last night we saw either a coati or an anteater (Giovanni thinks it was an ant-eater).

20 Aug. 1987

ACM 87-162 Sample #8. Pto. Viejo. Algae washes (and a few small rocks) in front of "Restaurant Stanford". Depth ~ 1m. Coll: Giovanni Bassey.
9°40.3'N 82°45'W

ACM 87-163 Sample #9. Pto. Viejo. Plankton net scraped over top of algal mat in front of "Restaurant Stanford". Mixed stand of numerous algae species (Caulerpa, various greens & reds, etc.) plus Thalassia and two other thin-bladed, "reedlike" grasses. Sample of algae taken for identification. Brusca/Wetzer. 9°40.3'N 82°45'W

Pto. Viejo.

ACM 87-164 Sample #10. Plankton net scraped across surface of Thalassia bed. A few other algae were mixed in, but primarily Thalassia (perhaps 99% by cover Thalassia). Brusca/Wetzer. 9°40.3'N 82°45'W

notes: Temperature of sand surface on white sand beach (frente el "Restaurante Stanford") = 44 °C. Temperature on black sand beach just No. of town = 47 °C.

21 Aug 1987
LACM 87-165: Sample #11. Pto Vargas (Cahuita Park). General sampling in area of Murillo's stations #1 & #2. 0.5-10 m depth. Rock & algae washes, coral rubble washes, etc. Two plankton nets for ~ 35 min. Brusca/Wetzer.

This was the general survey collection, to pick up the pods missed in the algae & coral rubble collections. Diadema present > 2.5 m (below thermocline). Good visibility today, ~ 2 m. It's amazing how the water turbidity can change so quickly, overnight, when the surf dies down & the rains let up.

This sample filled 8 plastic bags, including one with a red-orange cucumber only.

9° 44.52' N 82° 48.37' W

26 Aug 1987

Panama (Atlantic), San Blas Is.
Great Island

Sample #15. Intertidal sand collection from decaying coral. Filled plastic net - small coral w. Erycinidae?
Brusca/Wetzer in 9° 35.3' N 82° 54.8' W

21 Aug. 1987

Pto. Limon area. Rock/algae washes in big tidepool (same tidepool as sample #10 of 10 Jan 1987). Lots of Thalassia, an encrusting brown, and a jointed calcareous red alga. No Sargassum, Caulerpa or Halimeda, like last January. 5 bags taken from this sample, including some splash zone Littorina & Nerita.

LACM 87-166 Sample #12. Broosa/Wetzer $10^{\circ} 00.5' N$
 $83^{\circ} 02' W$

LACM 87-167 Sample #13. Algae samples from Pto. Viejo (from sample #9 area).

LACM 87-168 Sample #14. Trap sample - baited with tuna & left out overnight, $9^{\circ} 44.18' N$ $82^{\circ} 48.7' W$

26. Aug. 1987

Panama (Atlantic), San Blas Is.

Grass Island

SDNHM
A.0013

Sample #15. Intertidal hand collection from decaying sand filled palm root - small vial w. Excirobana?

Broosa/Wetzer ca. $78^{\circ} 56.8' W$ $9^{\circ} 33.3' N$

SDNHM
A.0013
Sample #16. Subtidal algal/rock washes/*Thalassia*
with plankton net, 1-4 m. Brusca/Wetzer
ca. $9^{\circ}33.3'N$ $78^{\circ}56.8'W$

Malunega Island
SDNHM
A.0013
Sample #17. Night light of Hotel San Blas pier
0-1 m. Brusca/Wetzer
ca. $9^{\circ}33.0'N$ $78^{\circ}57.4'W$

27. Aug. 87
Jag Island

SDNHM
A.0013
Sample #18. Algal and rock washes w. plankton
net, 2-6 m off ship wreck. Brusca/Wetzer
ca. $9^{\circ}33.3'N$ $78^{\circ}56.8'W$

SDNHM
A.0013
Sample #19. Intertidal hand collection of crabs and
isopods (*Cirolana* sp.?) from under shore
debris. Brusca/Wetzer ca. $9^{\circ}33.3'N$ $78^{\circ}56.8'W$

SDNHM
A.0013
29. August 87
Panama, (Pacific), Isla Taboga
Sample #20. 1st rocky point W. of Hotel
Taboga. Intertidal rock washes. Brusca/Wetzer.
ca. $9^{\circ}32'W$ $8^{\circ}54'N$