TOPOGRAPHIC FEATURES STUDIES

IN THE

NORTHWESTERN GULF OF MEXICO

1970-1985

HISTORY

1936: US Coast & Geodetic Survey maps pinnacles (banks) in Gulf of Mexico

1936: Francis. P. Shepard presumes 26 of these banks at the shelf break in NW Gulf originated from rising salt plugs

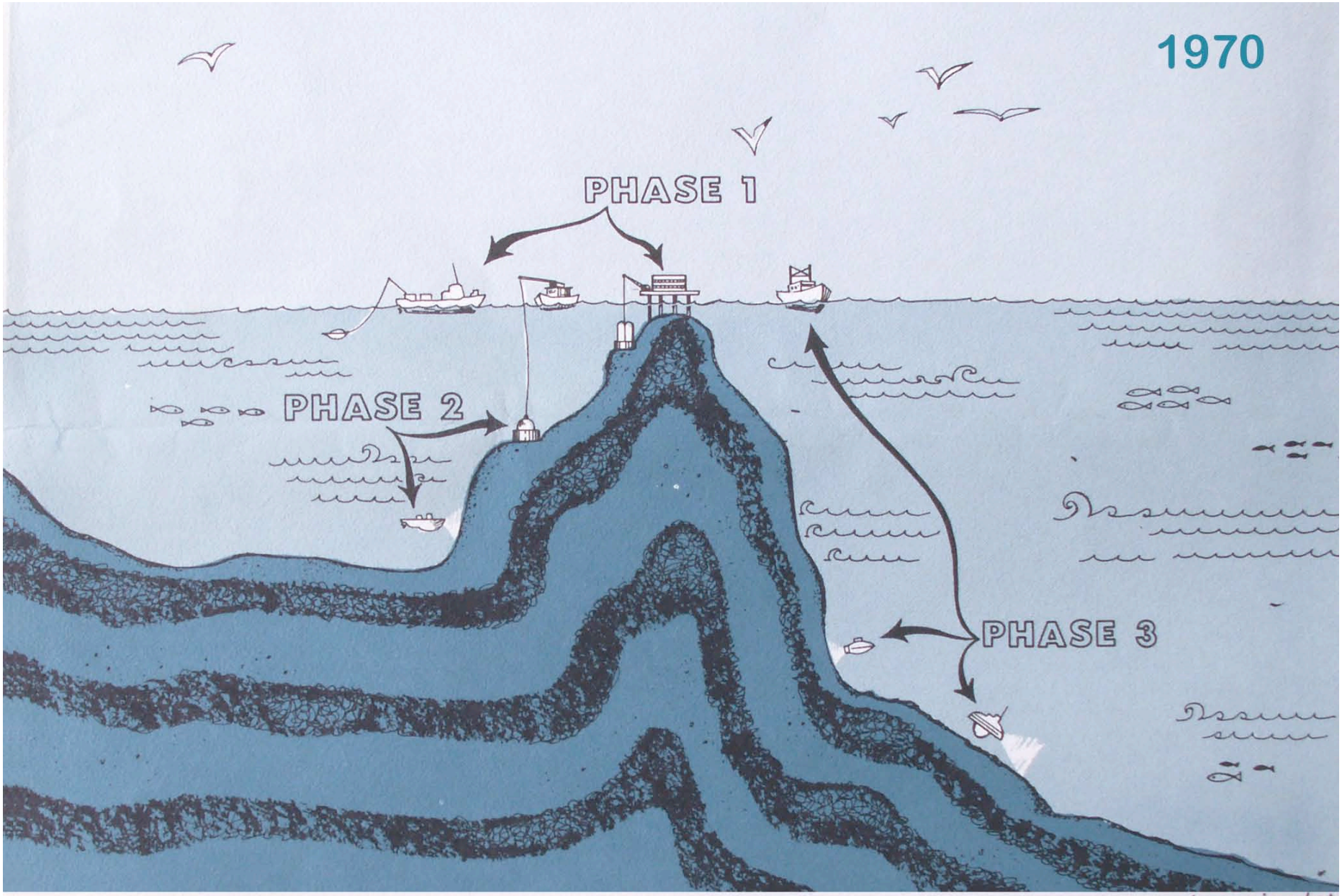
1953: H. C. Stetson proves presence of corals at Flower Gardens, presumes banks are bioherms built on salt domes and identifies terraces at 10, 30 & 62 fm. representing bioherm growth reflecting sea level changes.

1961: Dr. Thomas Pulley, Houston Museum of Natural History, first substantiates viable, growing coral reef communities at Flower gardens. Stages dive trips to Flower Gardens to observe and collect specimens using volunteers and US Navy Destroyer.

1971: G. Serpell Edwards Maps West Flower Garden and describes sedimentary facies and associated carbonate-producing communities.

WEST FLOWER GARDEN CRUISE LIST

DATE	CRUISE DESIGNATION	SHIP	ACTIVITIES
18-21 Jul. 1970	70-0-1	R.V. ORCA	Rotenone, Sampling
2-4 Sep. 1970	70-0-2	R.V. ORCA	Herbich's Rack placed, Rotenone,
3-7 Oct. 1970	70-0-3	R.V. ORCA	Rotenone, sampling
26-29 Oct. 1970	70-0-4	R.V. ORCA	Sampling
16-17 Dec. 1970	70-1201-17	PEARL M	Sampling
12-14 May 1971	71-0504-12	ROBERT B	Sampling
23-27 June 1971	71-0-6	R.V. ORCA	Clay pots placed, Rotenone, Herbich's rack located, sampling, NASA overflight
8-12 Oct. 1971	71-1001-08	MISS FREEPORT	Sampling
10-14 Jan. 1972	72-0110-IV	MISS FREEPORT	Rotenone (tent), coral head collected, engine block examined, clay pots retrieved, sampling
24 Feb.-7 Mar. 1972	72-0224-V	MISS FREEPORT	Sampling & Survey
24-28 Mar. 1972	72-0324-VI	MISS FREEPORT	Rotenone, Transect line laid, TV transects, sampling
April, 1972	72-0407-VII	MISS FREEPORT	Mapping
4-7 May 1972	72-0504-VIII	MISS FREEPORT	160 foot dive, T.V. transects, sampling
22-27 May 1972	72-0522-IX	MISS FREEPORT	Quadrat Quantification, sampling
5-12 June 1972	72-0605-X	MISS FREEPORT	Rotenone, submersible, sampling
23-29 Oct. 1972	72-1023-XII	MISS FREEPORT	Sampling hard-bank below living reef, grab, dredges
29 Nov.-4 Dec. 1972	72-1128-XIII	MISS FREEPORT	Rotenone, sampling East Flower Garden



THE FLOWER GARDENS OCEAN RESEARCH CENTER has grouped its scientific investigations into three phases aimed at defining the role of the continental shelves.

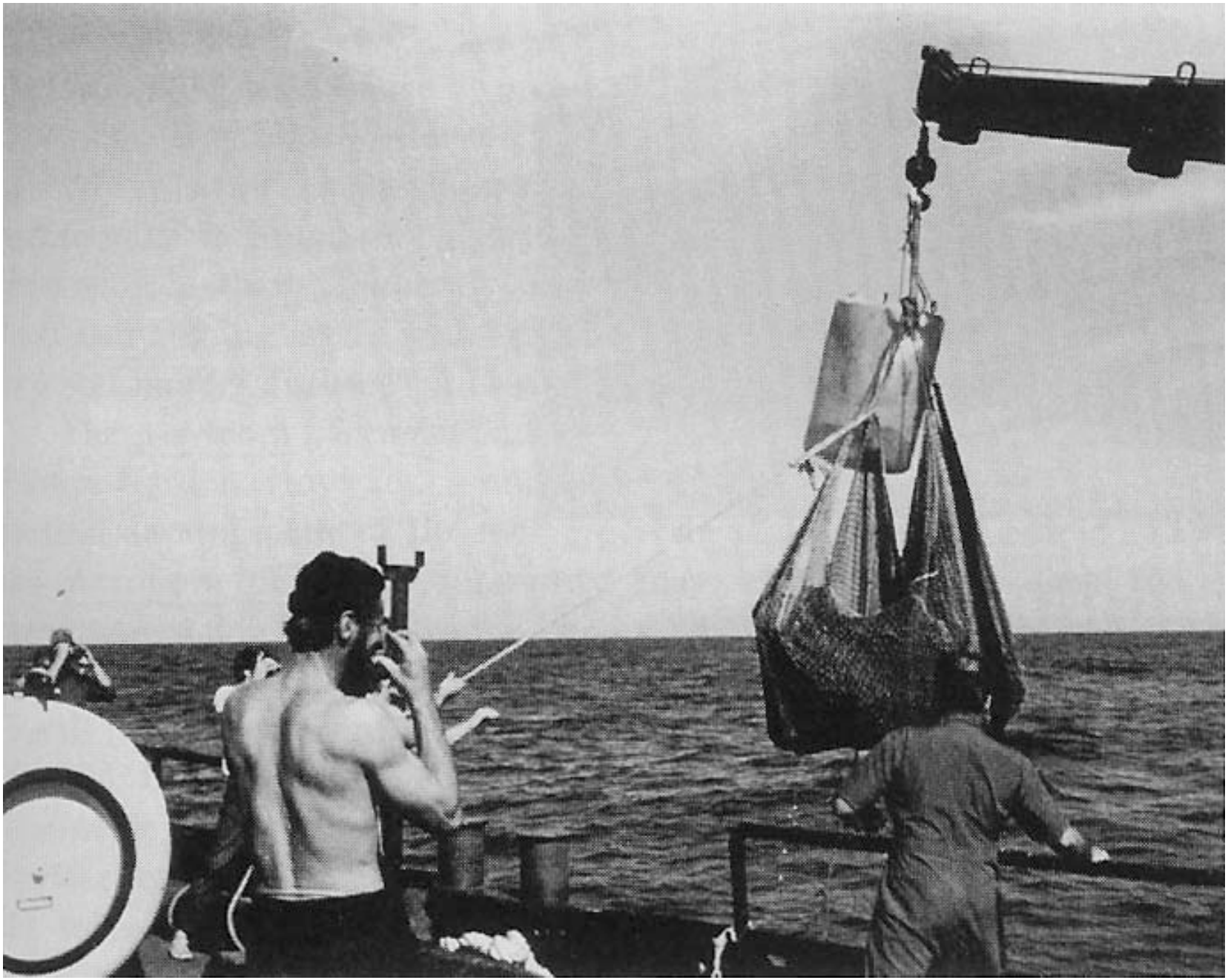
Art by Jody DeMary

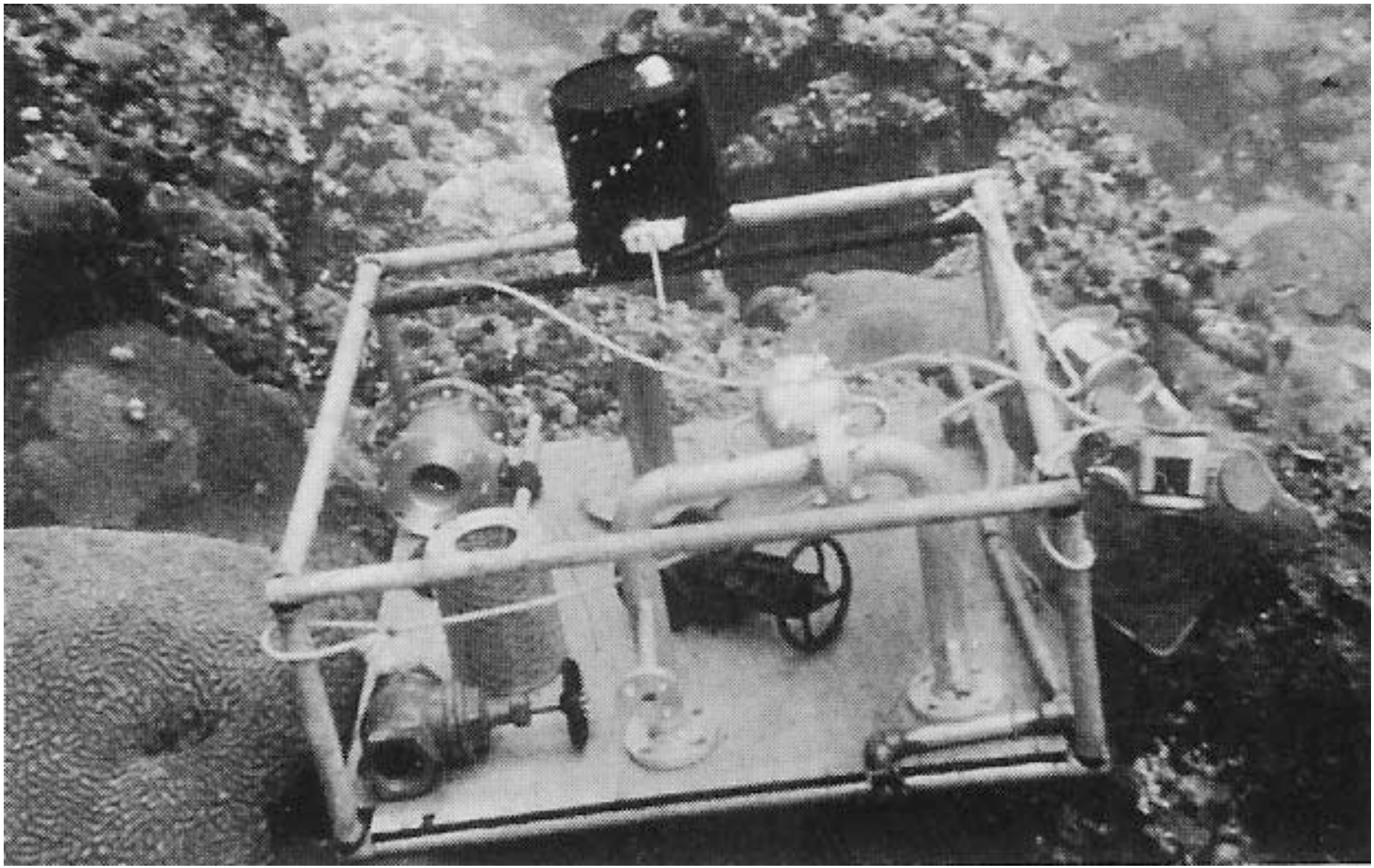

72 0110 IV

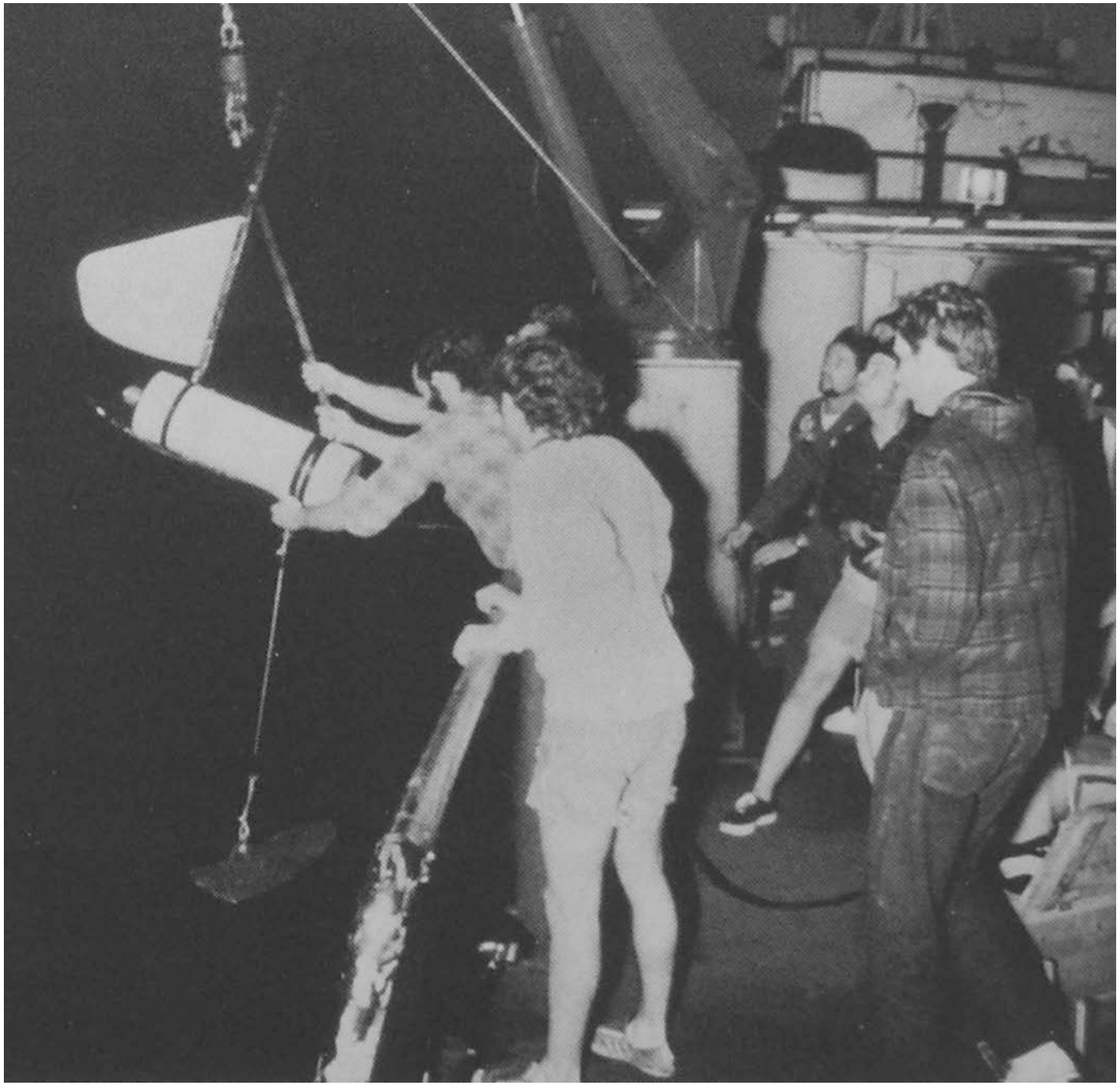

MISS FREEPORT


NOXFISH Fish Toxicant
Liquid-Emulsifiable

Fig. 5. Reef top at Three Hickey Rocks showing the Fire coral Millepora (light color) and sponges (dark) as well as a number of tropical reef fishes including Spotted goatfishes, a squirrelfish and damselfishes. (Photo courtesy of Mr. C. Bryan Jones)







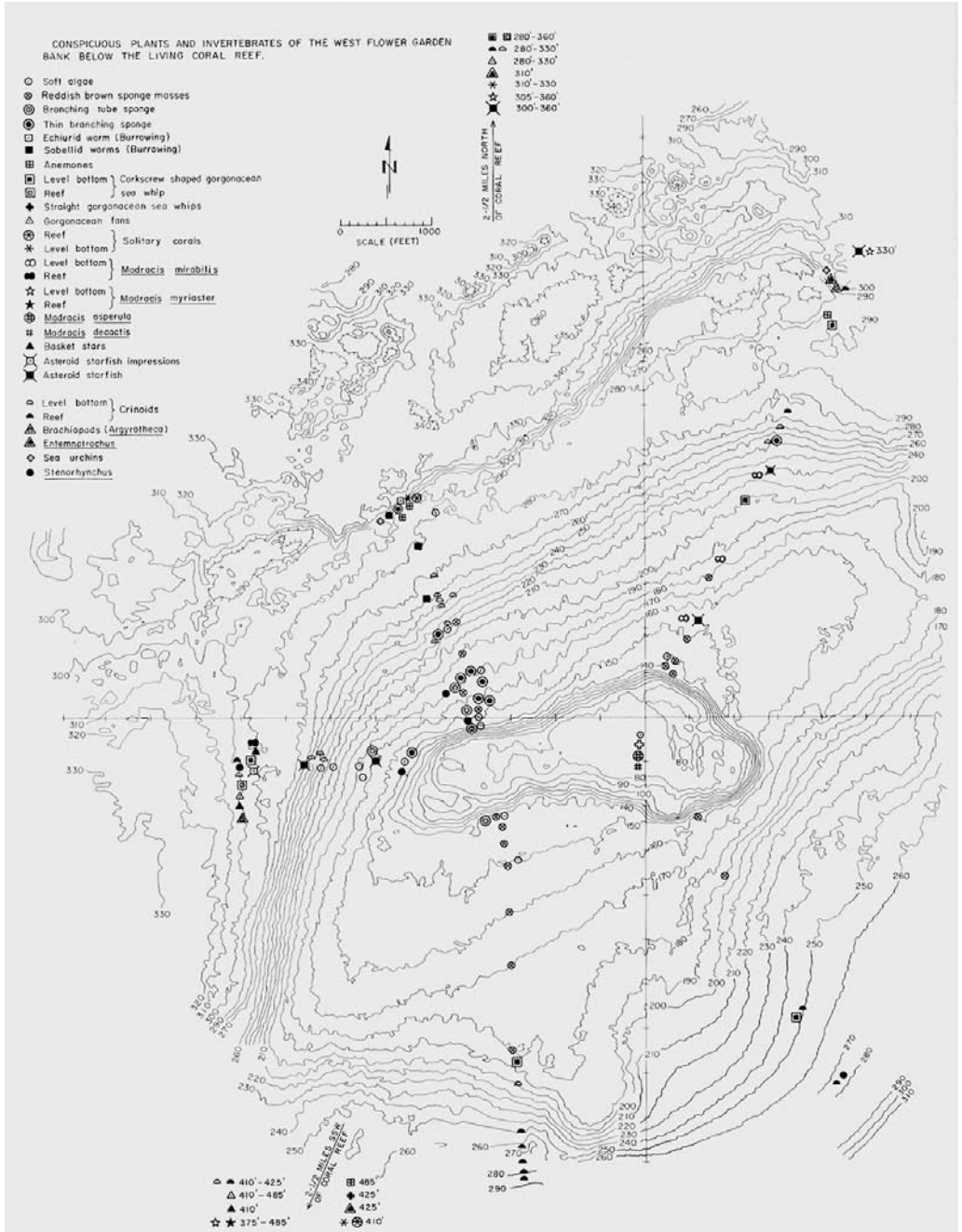


Fig. 29. Conspicuous plants and invertebrates of the West Flower Garden Bank below the living coral reef.

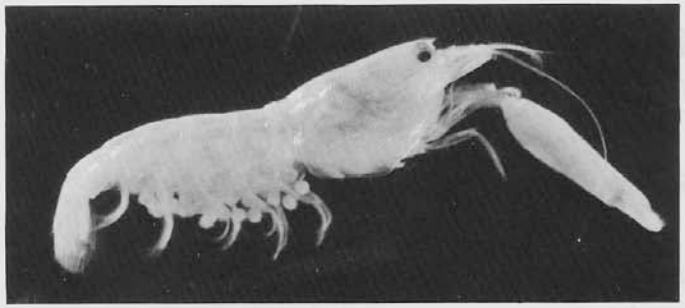


Fig. 51. Alpheus paracrinitus, ovigerous female specimen.

Fig. 52. Alpheus sp. ("Yellow snapping shrimp").

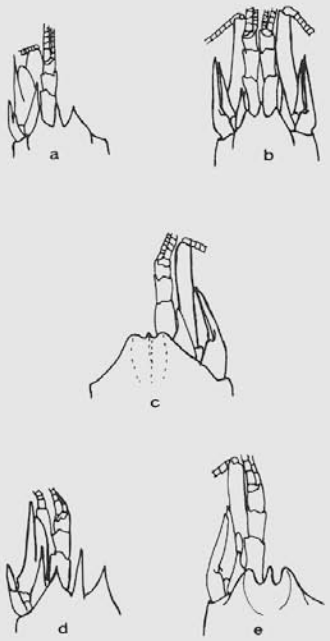
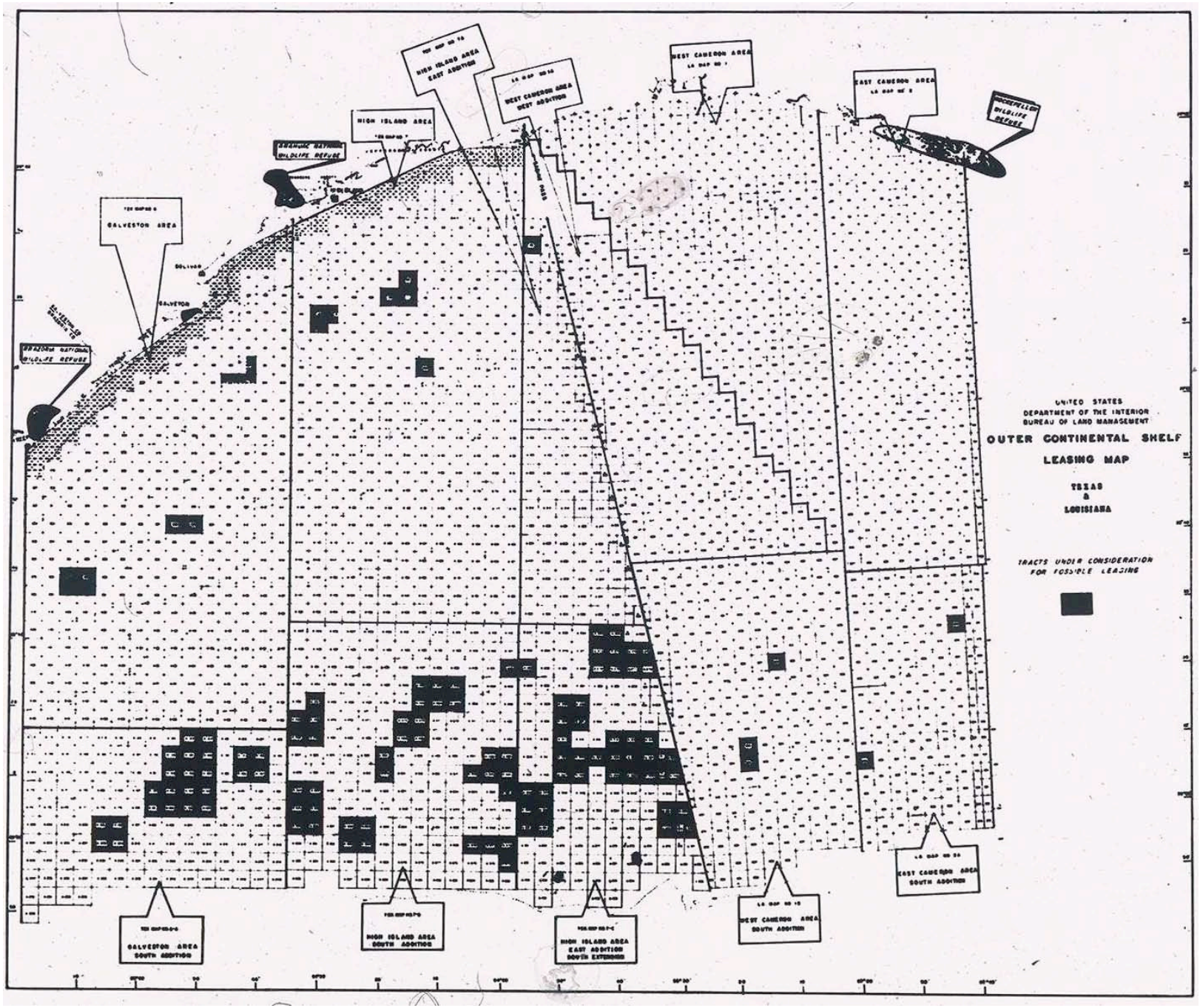


Fig. 53. Close-up drawings of anterior regions of species of Synalpheus from the West Flower Garden. a, Synalpheus apioceros; b, Synalpheus herricki; c, Synalpheus tanneri; d, Synalpheus townsendi; e, Synalpheus pandionis.

1974

BIOTA OF THE WEST FLOWER GARDEN BANK

Editors Thomas J. Bright
Linda H. Pequegnat


HIGH ISLAND AREA EAST ADDITION
WEST CAMERON AREA WEST ADDITION
WEST CAMERON AREA
EAST CAMERON AREA
HIGH ISLAND AREA
GALVESTON AREA
GALVESTON
BRAZORIA NATIONAL WILDLIFE REFUGE
SABINE PASS
UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT
OUTER CONTINENTAL SHELF
LEASING MAP
TEXAS
&
LOUISIANA
TRACTS UNDER CONSIDERATION FOR POSSIBLE LEASING
GALVESTON AREA SOUTH ADDITION
HIGH ISLAND AREA SOUTH ADDITION
HIGH ISLAND AREA EAST ADDITION SOUTH EXTENSION
WEST CAMERON AREA SOUTH ADDITION
EAST CAMERON AREA SOUTH ADDITION

1973

USGS, "Multiple Use" meeting in Metarie, La.

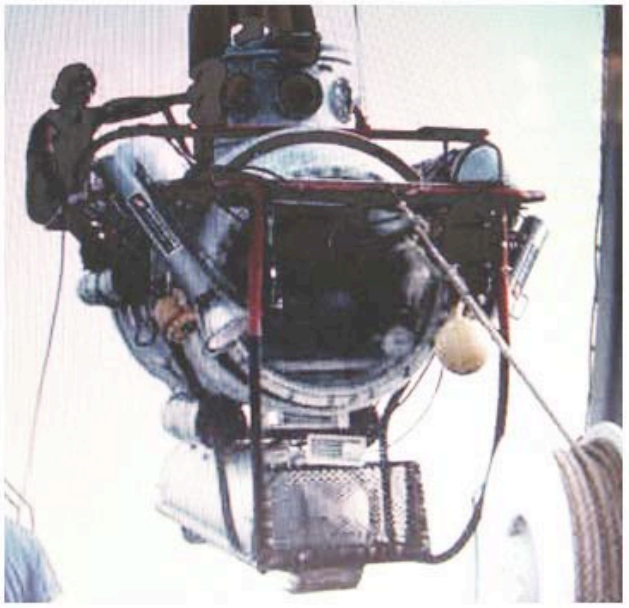
Seeks to design research and lease stipulations to protect Flower Gardens during anticipated offshore oil & gas exploration and production.

Agree to require modern positioning and mapping, establish "no drilling or no activity" zones, establish "buffer zones" with "shunting" and monitoring requirements.

Plan future meetings to review and refine protective measures.

1973

R.V. GYRE



D. R. V. DIAPHUS

1975

NORTHWESTERN GULF OF MEXICO
TOPOGRAPHIC FEATURES
STUDY

SUBMITTED TO THE

U.S. DEPARTMENT OF THE INTERIOR

BUREAU OF LAND MANAGEMENT

OUTER CONTINENTAL SHELF OFFICE

NEW ORLEANS, LOUISIANA

CONTRACT NO. AA550-CT7-15

RESEARCH CONDUCTED BY THE

COLLEGE OF GEOSCIENCES

TEXAS A&M UNIVERSITY COLLEGE STATION, TEXAS

Through The
TEXAS A&M RESEARCH FOUNDATION

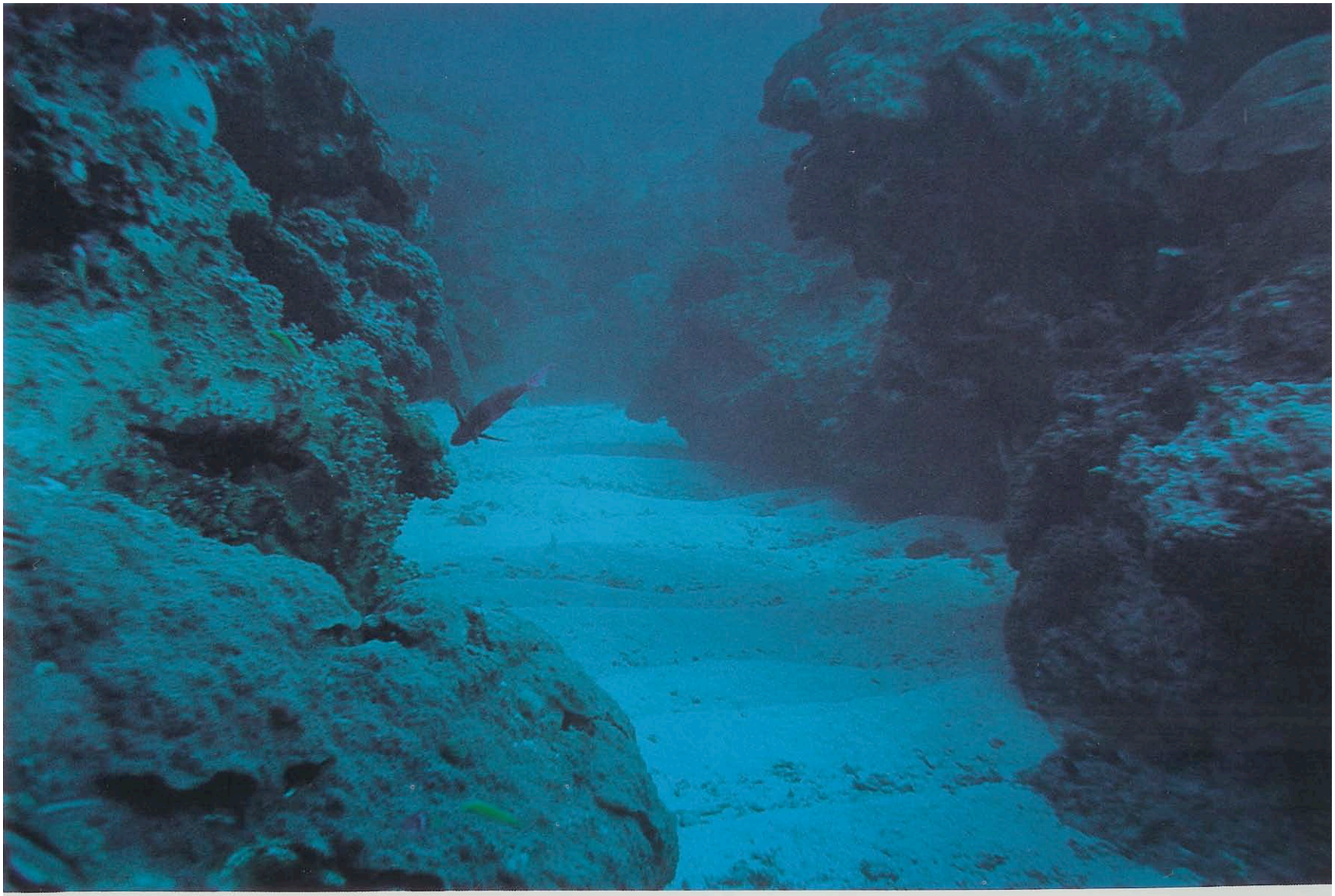


Figure III-1. Coral Debris Facies at crest of East Flower Garden Bank. Depth 27 m. Coarse coral sand and gravel between large massive corals. Note large scale ripple marks.

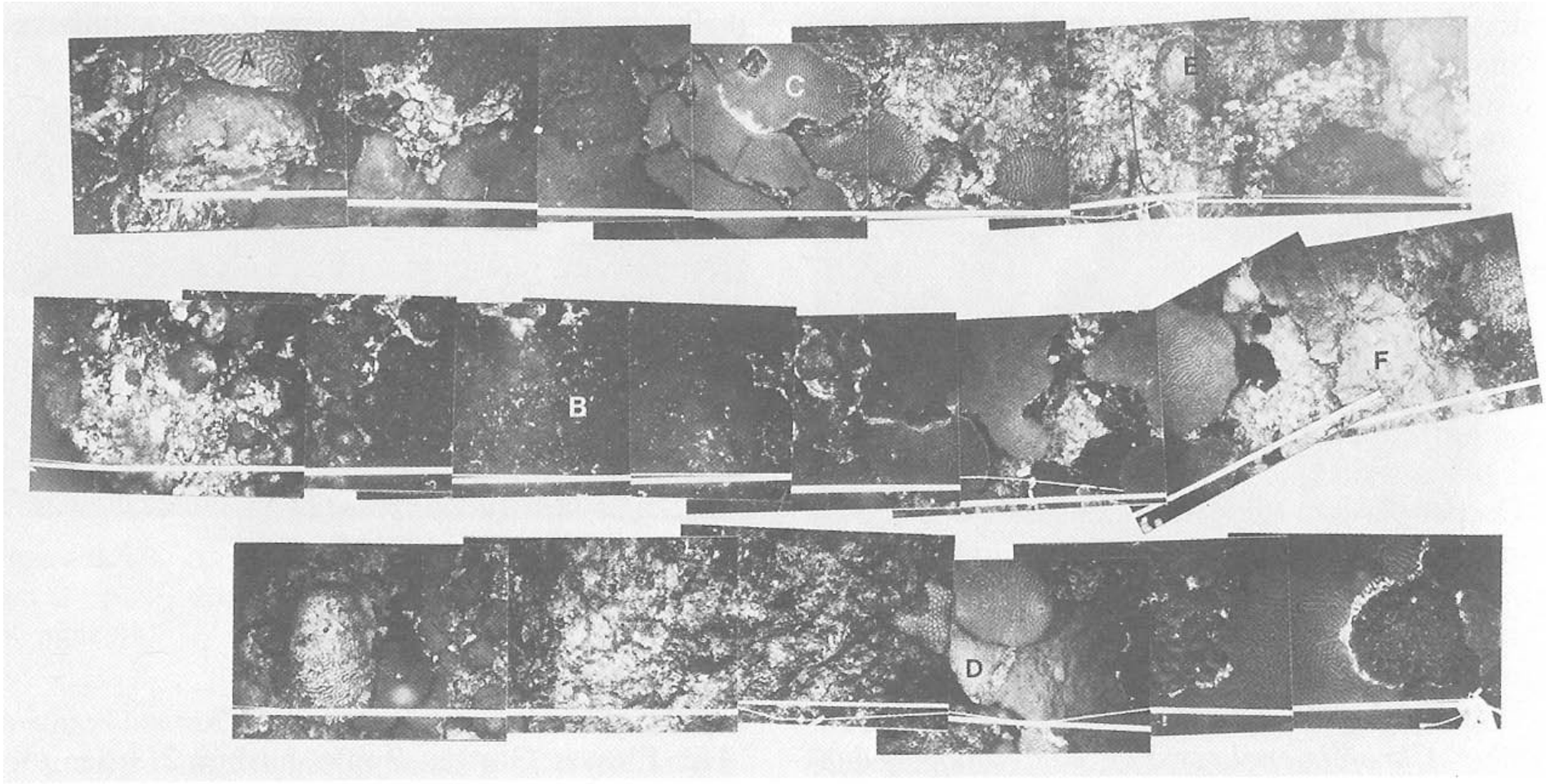


Figure 6.16. Typical photographic mosaic of 10-m-long transect at 24-m depth on the West Flower Garden. *A = Colpophyllia; B = Montastrea annularis; C = Diploria strigosa; D = Montastrea cavernosa; E = Porites astreoides; F = Millepora alcicornis.*

TABLE 6.2. Dominance (% cover) of Major Hermatypic Corals on the Hard Substratum Within the *Diploria-Montastrea-Porites* Zone (High-Diversity Coral Reef)[a]

Major Hermatypic Corals	Weighted Averages, All Sites Combined	Dominance Expressed as the Mean Percentage of Cover (95% confidence limits of the means)		
		Station EFG 26 (N = 23)	Station EFG 20 (N = 23)	Station WFG 24 (N = 18)
M. annularis	31.80	40.06 (34.88–45.20)	22.88 (17.32–28.51)	32.63 (22.45–42.93)
D. strigosa	6.23	4.43 (2.01–5.03)	8.63 (4.18–13.14)	5.46 (1.93–8.99)
Colpophyllia spp.	5.33	7.33 (3.49–11.12)	6.62 (3.57–9.62)	1.11 (0.17–2.05)
M. cavernosa	3.86	3.68 (1.48–6.13)	3.84 (2.82–5.89)	4.10 (1.28–6.92)
M. alcicornis	3.61	3.21 (2.01–4.38)	3.69 (1.52–5.94)	4.03 (2.04–6.20)
P. astreoides	2.26	2.26 (1.28–3.24)	1.94 (1.17–2.72)	2.68 (1.60–3.76)
M. decactis	1.91	3.02 (0.47–5.61)	0.88 (0.47–1.31)	1.79 (0.15–3.43)
S. siderea	0.90	0.00	1.27 (0–3.32)	1.56 (0–3.85)
Agaricia spp.	0.83	0.76 (0.34–1.19)	0.90 (0.52–1.28)	0.83 (0.26–1.40)
S. michelini	0.30	0.16 (0.02–0.34)	0.21 (0–0.57)	0.59 (0–1.43)
M. angulosa	0.26	0.60 (0.19–1.02)	0.00	0.17 (0.01–0.33)
S. cubensis	0.03	0.03 (0–0.06)	0.03 (0–0.09)	0.03 (0.–0.08)
Total live coral	56.82	64.53 (59.6–69.46)	50.42 (45.1–55.74)	55.15 (23.77–86.53)

[a]Hard substratum constitutes approximately 85% of the bottom within the zone. Determinations are based on 23 transects at each EFG site and 18 at the WFG site. The number of each station is also the depth of collection in meters.

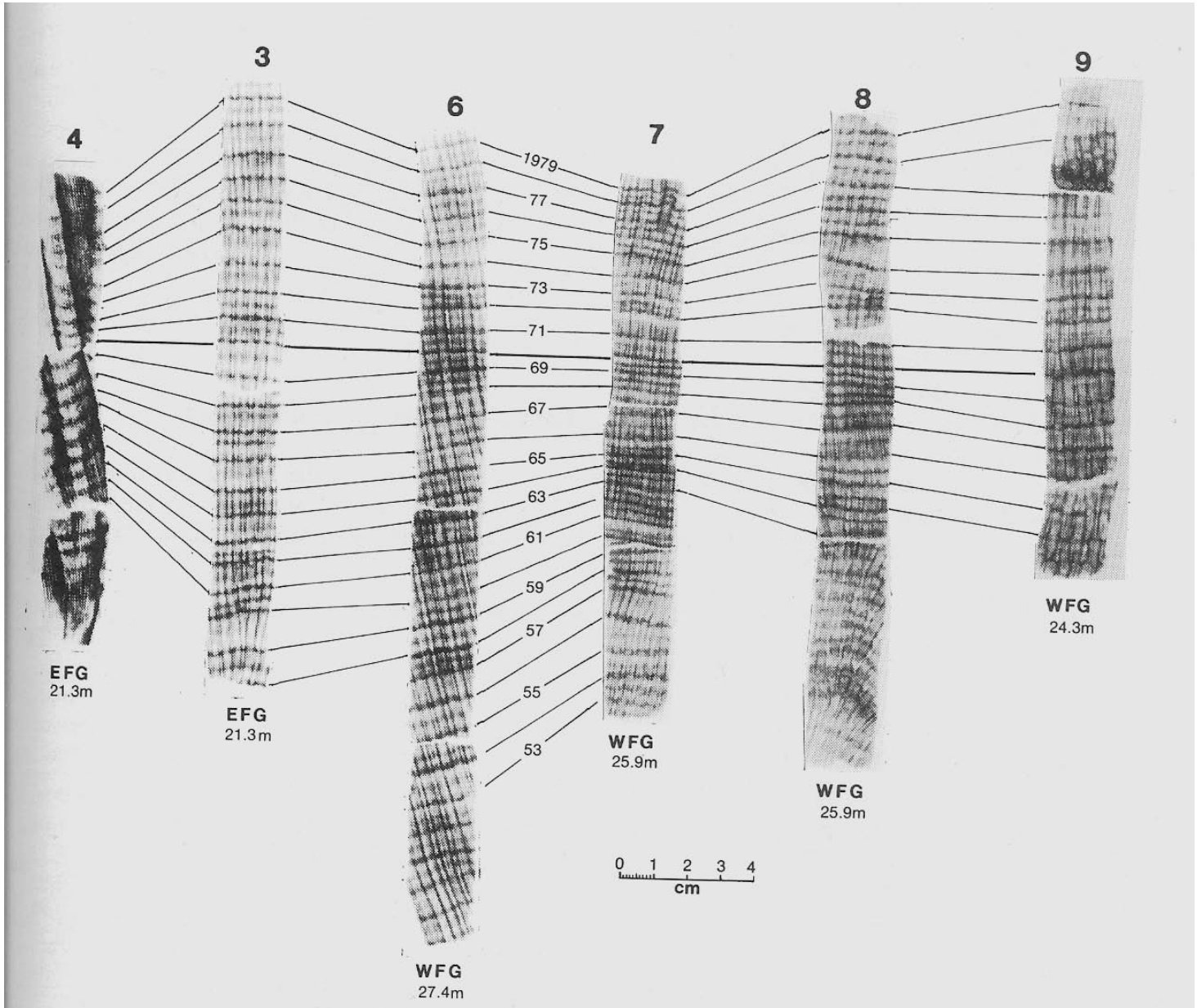
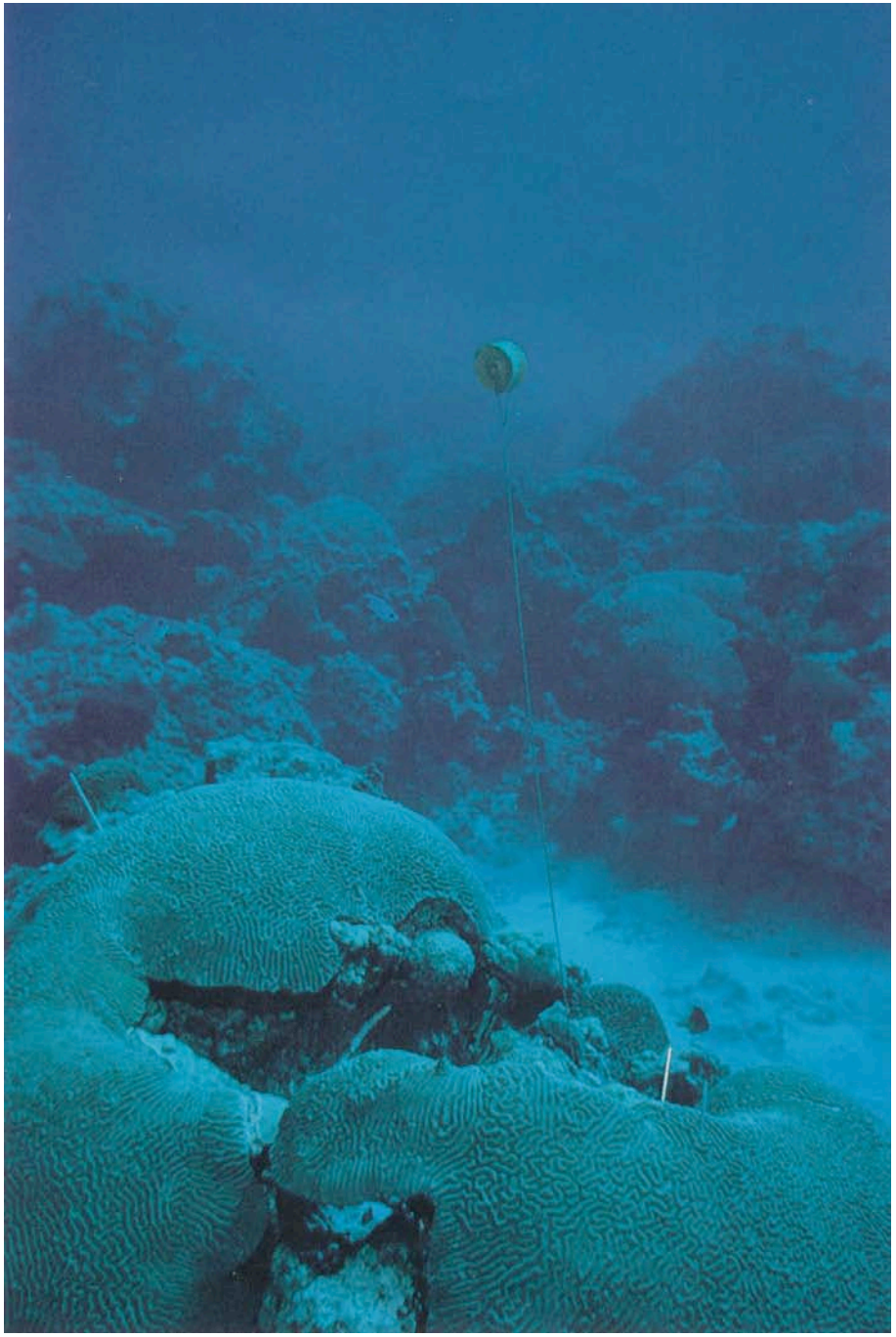


Figure 6.17. X-Radiographs of cores taken from *Montastrea annularis* and *Diploria strigosa* at the East and West Flower Garden Banks, showing annual bands. Locations and depths of collection are indicated beneath each core.



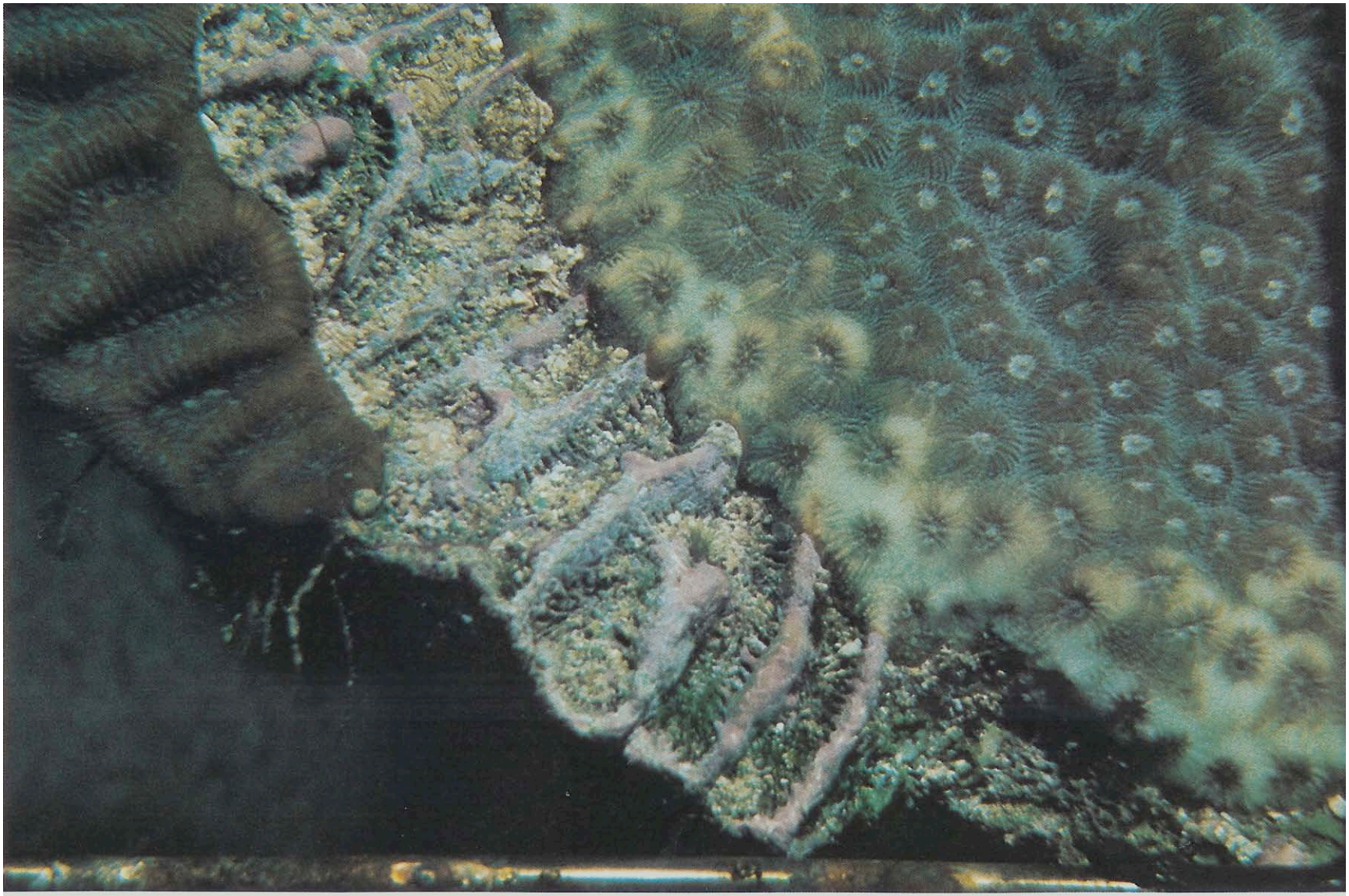
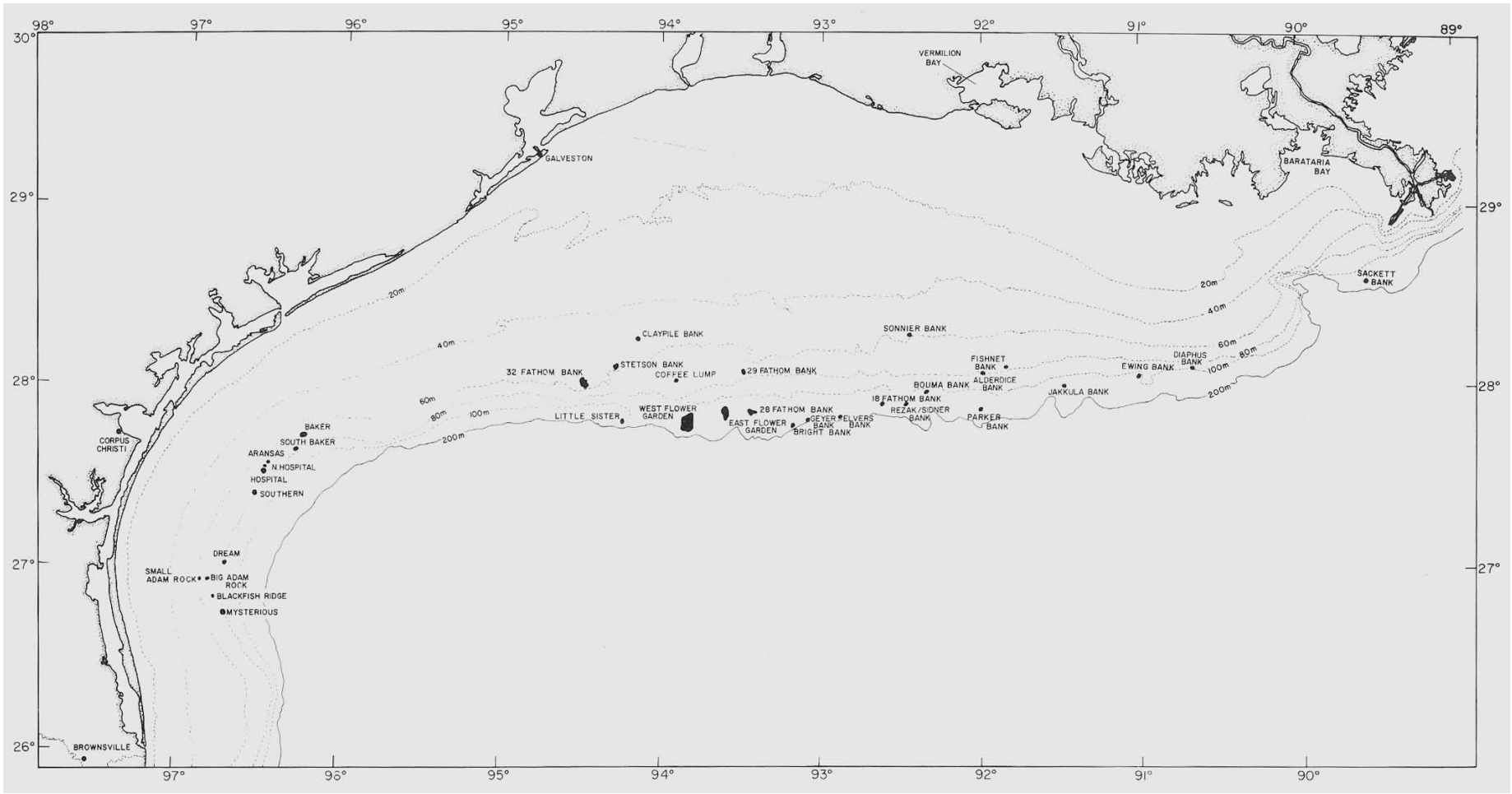


Figure IV-6. *Montastrea annularis* (upper right) encroaching on a receding colony of brain coral, *Diploria* (left). Encrusting growth of stony corals is thought to be an extremely important process by which the coral populations retain dominance as substratum occupiers and builders. Corallum between the two living coral colonies is occupied by coralline algae (purple) on ridges and sand-sized carbonate particles in depressions. 26 m depth, West Flower Garden.

Figure IV-7. Diseased brain coral, *Diploria strigosa*, suffering progressive mortality from right to left while being encroached upon from below by an encrusting colony of the hydrozoan coral *Millepora* sp. Filamentous algae are frequently conspicuous as a green colored band along the receding border of diseased coral. It is not known whether such algae are in any way responsible for death of coral.


98°
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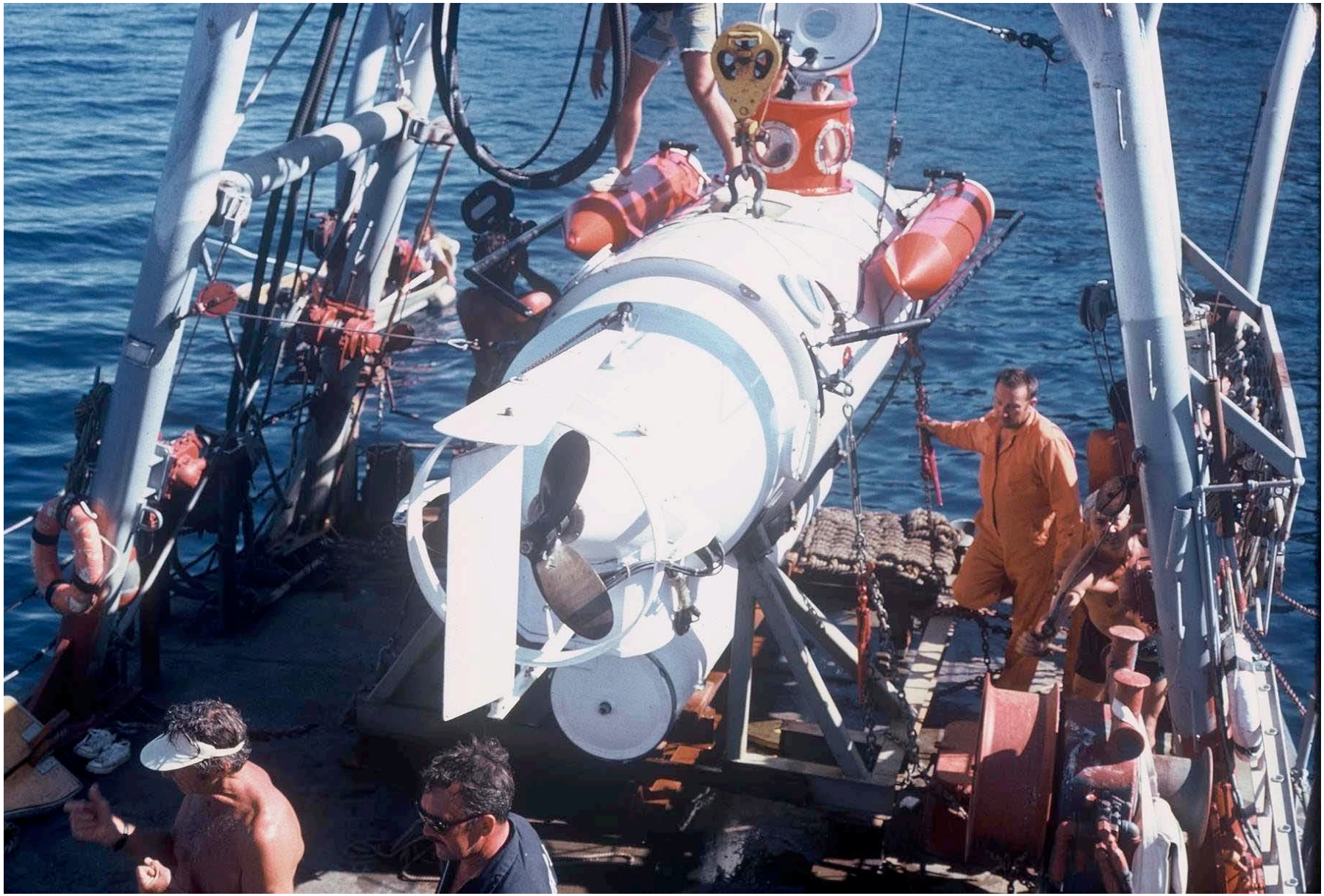
95°
94°
93°
92°
91°
90°
89°
30°
29°
28°
27°
26°
VERMILION BAY
GALVESTON
BARATARIA BAY
SACKETT BANK
20m
40m
60m
80m
100m
200m
CLAYPILE BANK
SONNIER BANK
STETSON BANK
COFFEE LUMP
32 FATHOM BANK
29 FATHOM BANK
FISHNET BANK
DIAPHUS BANK
EWING BANK
BOUMA BANK
ALDERDICE BANK
JAKKULA BANK
18 FATHOM BANK
REZAK/SIDNER BANK
PARKER BANK
LITTLE SISTER
WEST FLOWER GARDEN
28 FATHOM BANK
EAST FLOWER GARDEN
GEYER BANK
ELVERS BANK
BRIGHT BANK
CORPUS CHRISTI
BAKER
SOUTH BAKER
ARANSAS
N HOSPITAL
HOSPITAL
SOUTHERN
DREAM
SMALL ADAM ROCK
BIG ADAM ROCK
BLACKFISH RIDGE
MYSTERIOUS
BROWNSVILLE



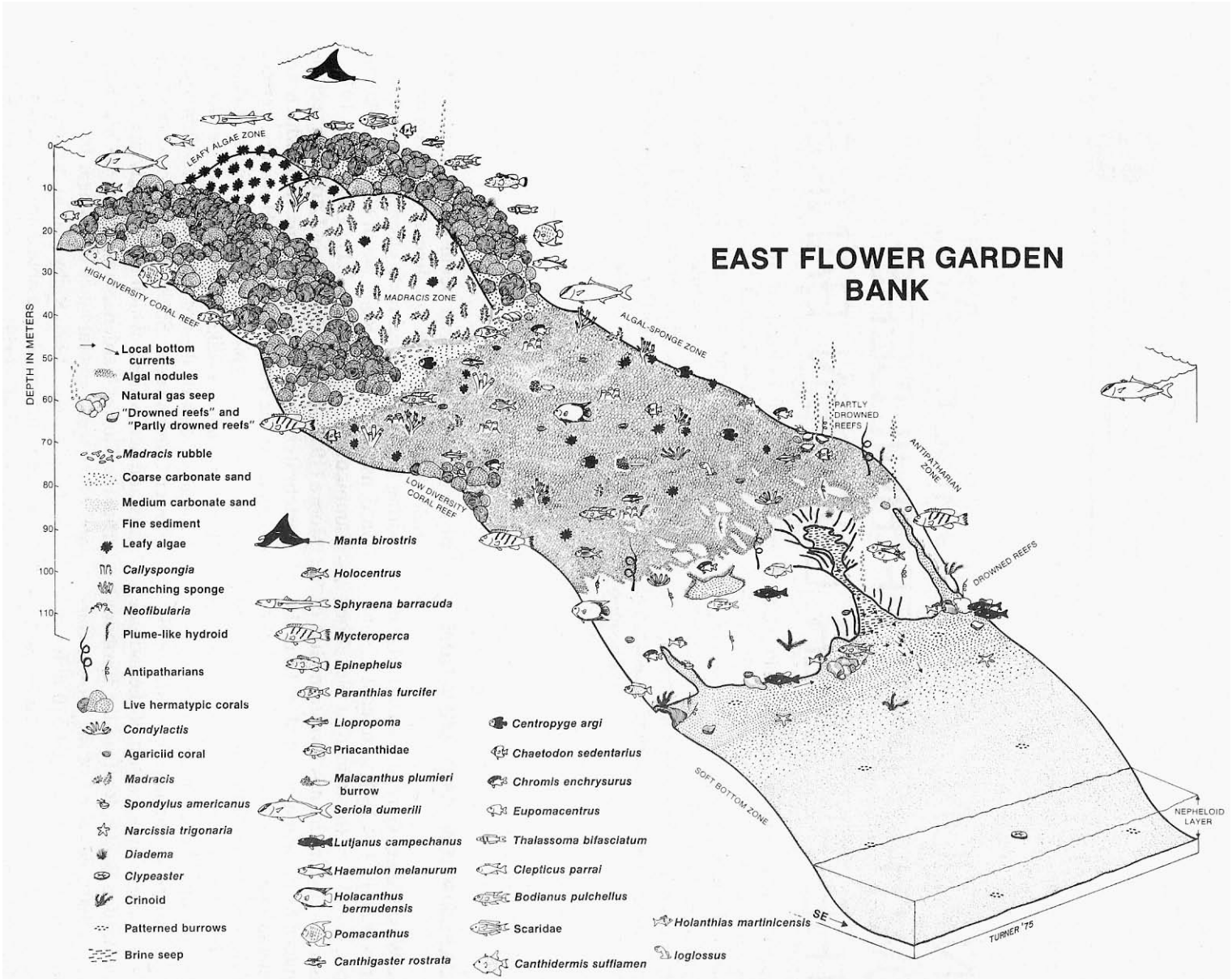


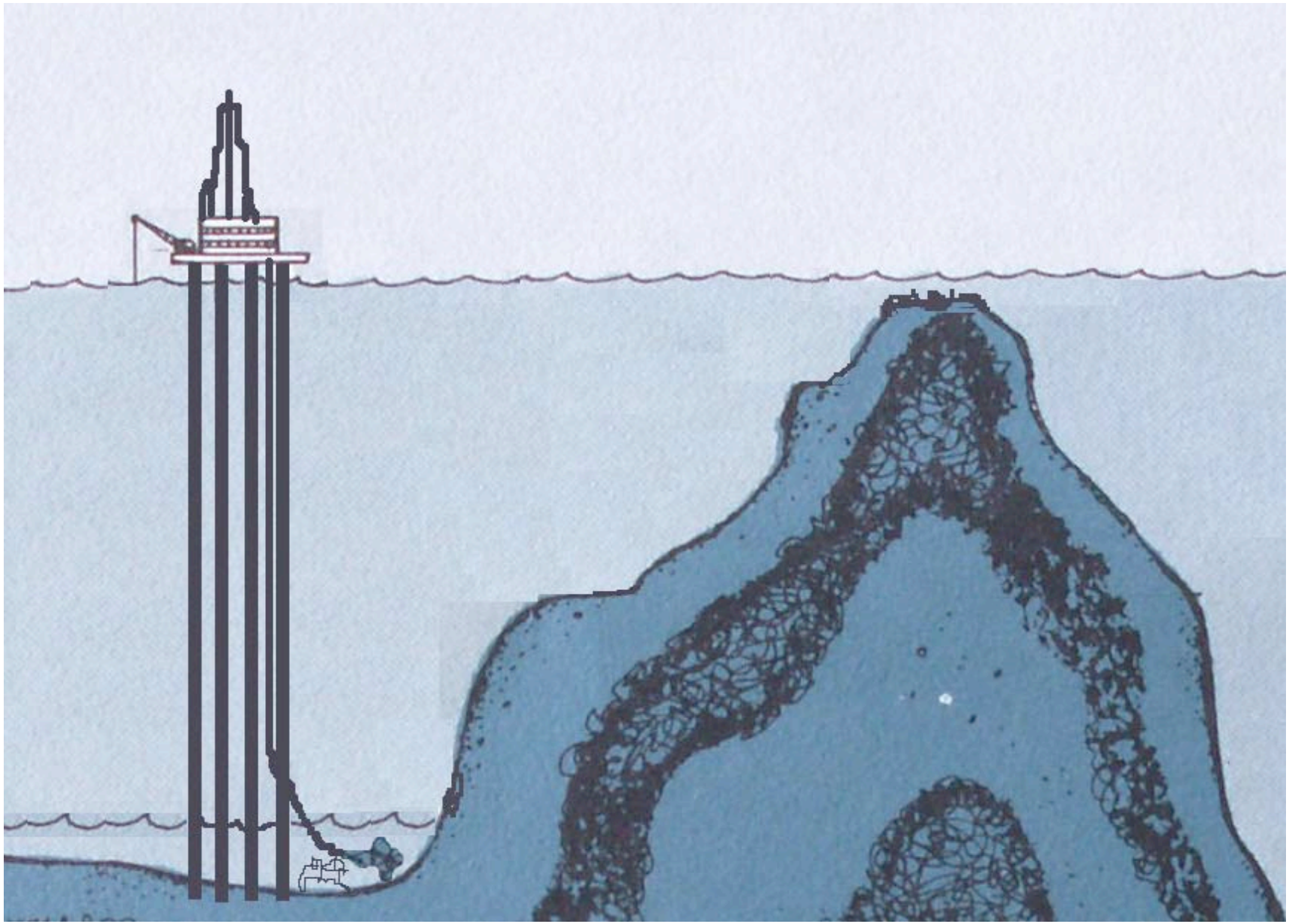
Figure 6.1. Conspicuous biota and biotic zones on the southeastern part of East Flower Garden Bank. High-diversity coral reefs = *Diploria-Montastrea-Porites* Zone. Low-diversity coral reefs = *Stephanocoenia-Millepora* Zone. This is also representative of the

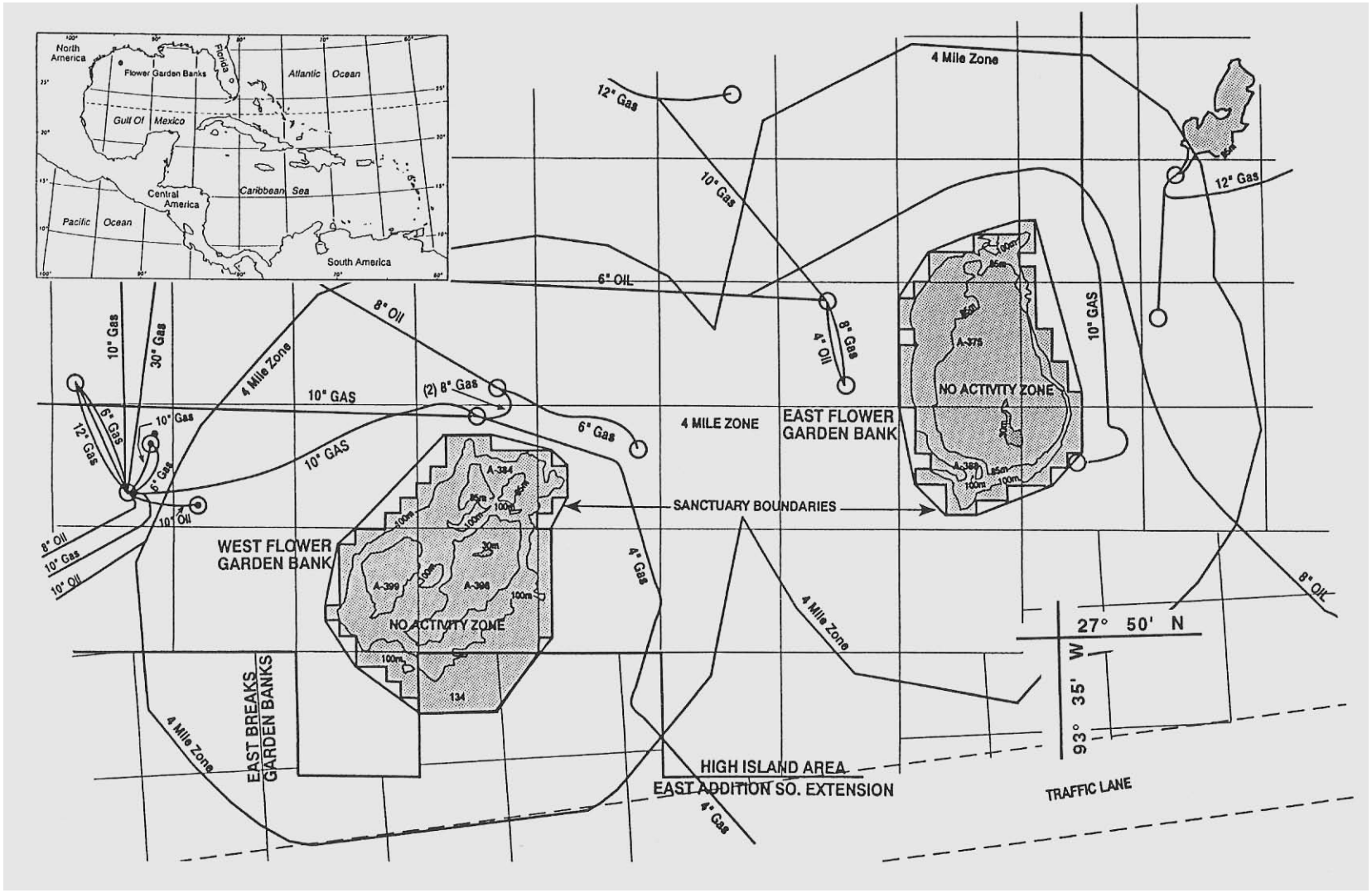
1977 LEASE STIPULATIONS FOR BIOLOGICALLY SENSITIVE BANKS

1. *No Activity Zone*, above 85m depth, the general lower depth limit of reefal communities (coral reefs & algal-sponge zone) Extended to 100m for Flower Gardens.

2. *1 Mile Zone*, surrounding the No Activity Zone. Shunting of all drill effluents to near bottom (about 10m) is required. Shunting and monitoring of effects on the reefal communities both required at Flower Gardens

3. *3 Mile Zone*, surrounding the 1 Mile Zone. Either shunting or monitoring required, not both. Expanded to 4 Mile Zone for Flower Gardens, with shunting required but not monitoring.




North America
Flower Garden Banks
Florida
Atlantic Ocean
Gulf Of Mexico
Central America
Caribbean Sea
Pacific Ocean
South America
4 Mile Zone
12" Gas
10" Gas
6" OIL
8" Oil
4" Oil
8" Gas
10" GAS
30" Gas
(2) 8" Gas
6" Gas
12" Gas
10" Oil
8" Oil
4" Gas
A-375
NO ACTIVITY ZONE
EAST FLOWER GARDEN BANK
4 MILE ZONE
SANCTUARY BOUNDARIES
WEST FLOWER GARDEN BANK
A-384
A-399
A-398
NO ACTIVITY ZONE
134
EAST BREAKS GARDEN BANKS
HIGH ISLAND AREA
EAST ADDITION SO. EXTENSION
TRAFFIC LANE
27° 50' N
93° 35' W

In 1977-79 a concept of **ENVIRONMENTAL PRIORITIZATION** emerged relating to the nature of the Texas-Louisiana fishing banks described and studied by our group. In general, it is felt that the banks can be categorized and prioritized as follows, depending on their hydrographic, geomorphic and biological characteristics. The concept was refined further by 1985:

1 . ***Shelf-edge constructional carbonate banks*** of high relief harboring clear-water epibenthic communities, including coral reef and Algal-Sponge Zone communities in which the predominant active frame builders are hermatypic corals and coralline algae, respectively.

With significant coral reefs:
West Flower Garden *East Flower Garden* *18 Fathom Bank* *Bright Bank*

Lacking coral reefs:
28 Fathom Bank *Bouma Bank* *Parker Bank* *Ewing Bank* *Applebaum* *Geyer*
Elvers *Rezak-Sidner* *Sweet* *Alderdice* *Jakkula* *Ewing* ***(Sackett Bank)*

2 . ***Mid-shelf claystone-siltstone banks*** of shallow crest depth (25-30 m) bearing on their upper portions depauperate clear-water epibenthic communities, including several species of hermatypic corals and numerous tropicals reef fishes .

Stetson Bank *Claypile Bank* *Sonnier Bank (3 Hickey Rock)*

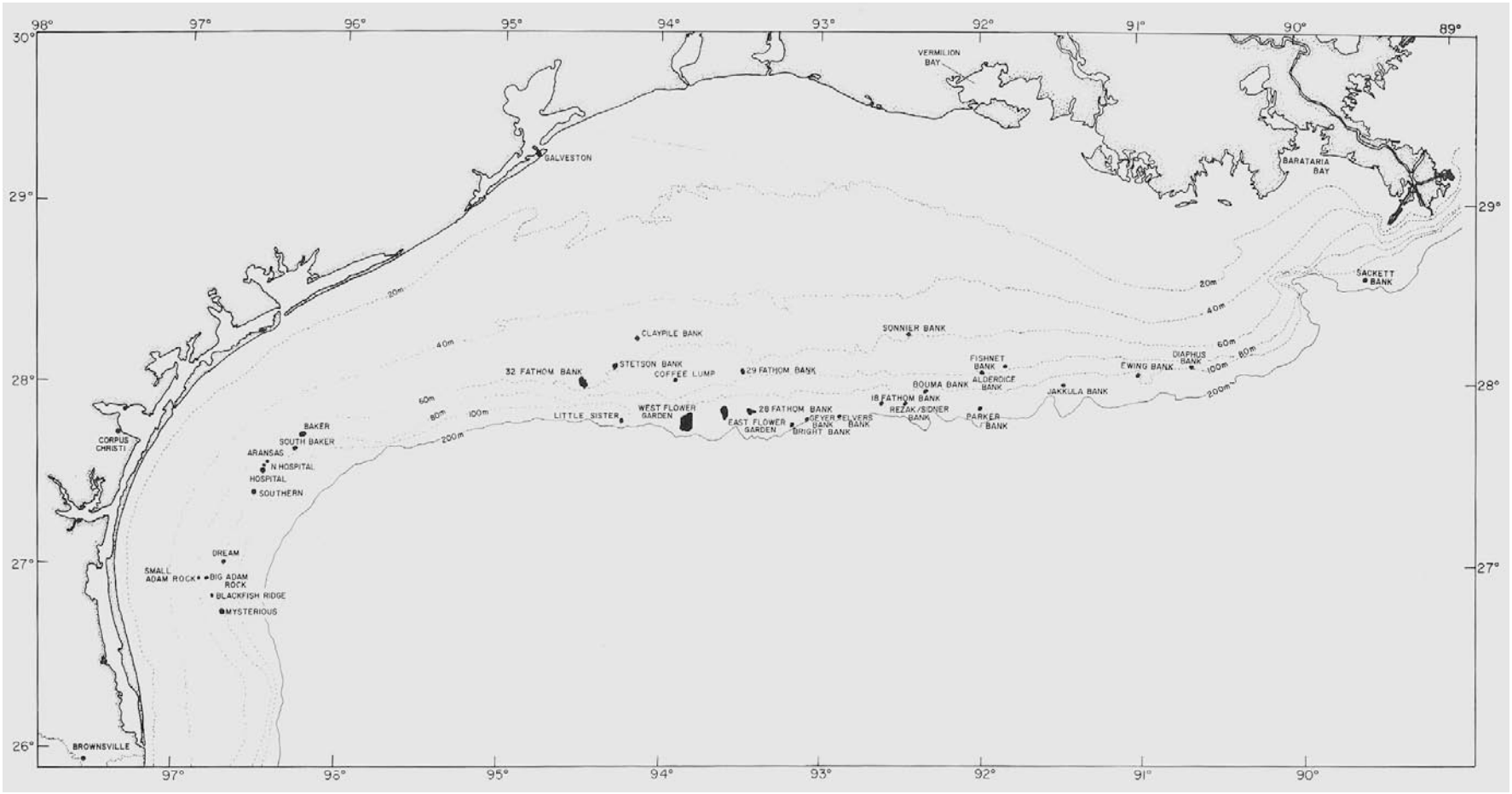
3 . ***High relief mid-shelf carbonate banks*** of deeper crest depth (around 56-67 m) and bearing moderately developed Antipatharian Zone epifaunal communities, including a severely limited population of small corals . These communities are subject to frequent influxes of turbid water .

Baker Bank *South Baker Bank* *Aransas Bank* *North Hospital Rock*
Hospital Rock *Southern Bank* *Dream Bank*

4 . ***Low relief mid-shelf carbonate banks*** of deeper crest depth (60-70 m) and bearing poorly developed Antipatharian Zone benthic communities, which are subject to nearly constant conditions of high turbidity and sedimentation.

Big Adam Rock *Small Adam Rock* *Blackfish Ridge* *Mysterious Bank*

** Sackett Bank could be classified as a biologically depauperate and regressive category #I bank . However, only 21 miles from the Mississippi Delta, it is hypothetically subject to continual adverse environmental conditions (high turbidity, sedimentation, changeable temperature and salinity, etc.) In terms of environmental priority it is closer to category #3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VERMILION BAY
GALVESTON
BARATARIA BAY
SACKETT BANK
20m
40m
60m
80m
100m
200m
CLAYPILE BANK
SONNIER BANK
32 FATHOM BANK
STETSON BANK
COFFEE LUMP
29 FATHOM BANK
FISHNET BANK
ALDERDICE BANK
DIAPHUS BANK
EWING BANK
BOUMA BANK
18 FATHOM BANK
JAKKULA BANK
LITTLE SISTER
WEST FLOWER GARDEN
28 FATHOM BANK
EAST FLOWER GARDEN
REZAK/SIDNER BANK
GEYER BANK
ELVERS BANK
BRIGHT BANK
PARKER BANK
CORPUS CHRISTI
BAKER
SOUTH BAKER
ARANSAS
N HOSPITAL
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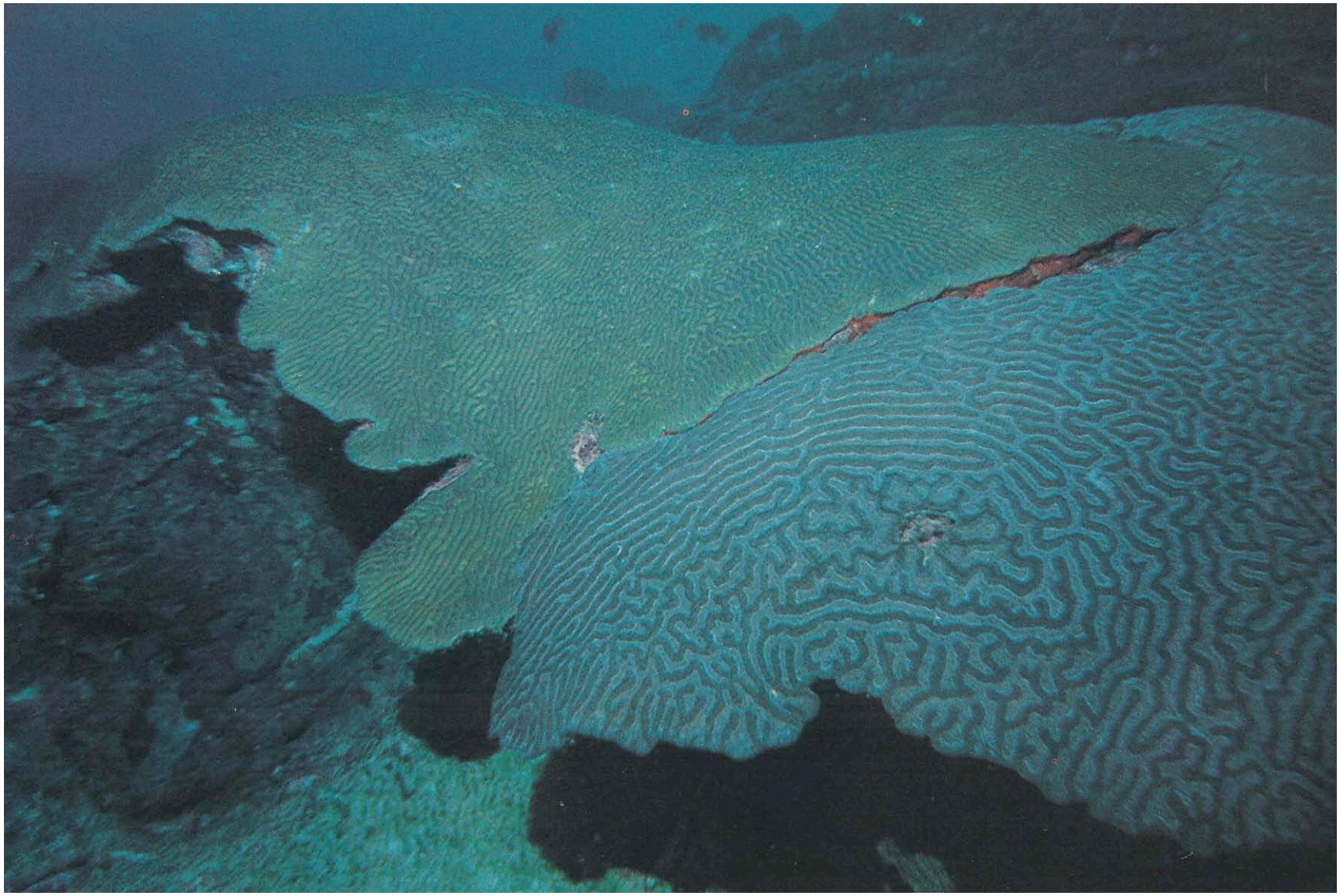
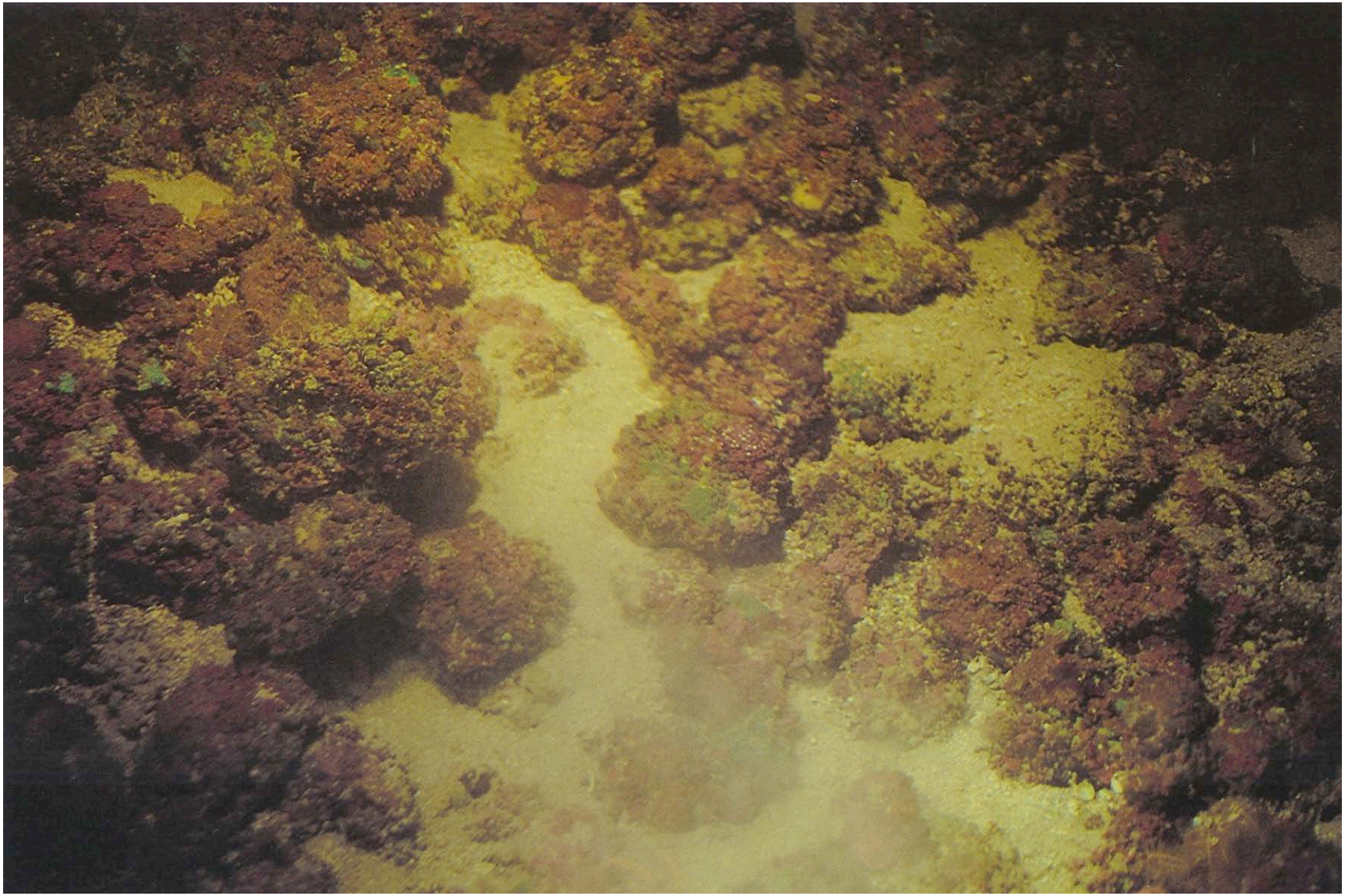
SOUTHERN
DREAM
SMALL ADAM ROCK
BIG ADAM ROCK
BLACKFISH RIDGE
MYSTERIOUS
BROWNSVILLE





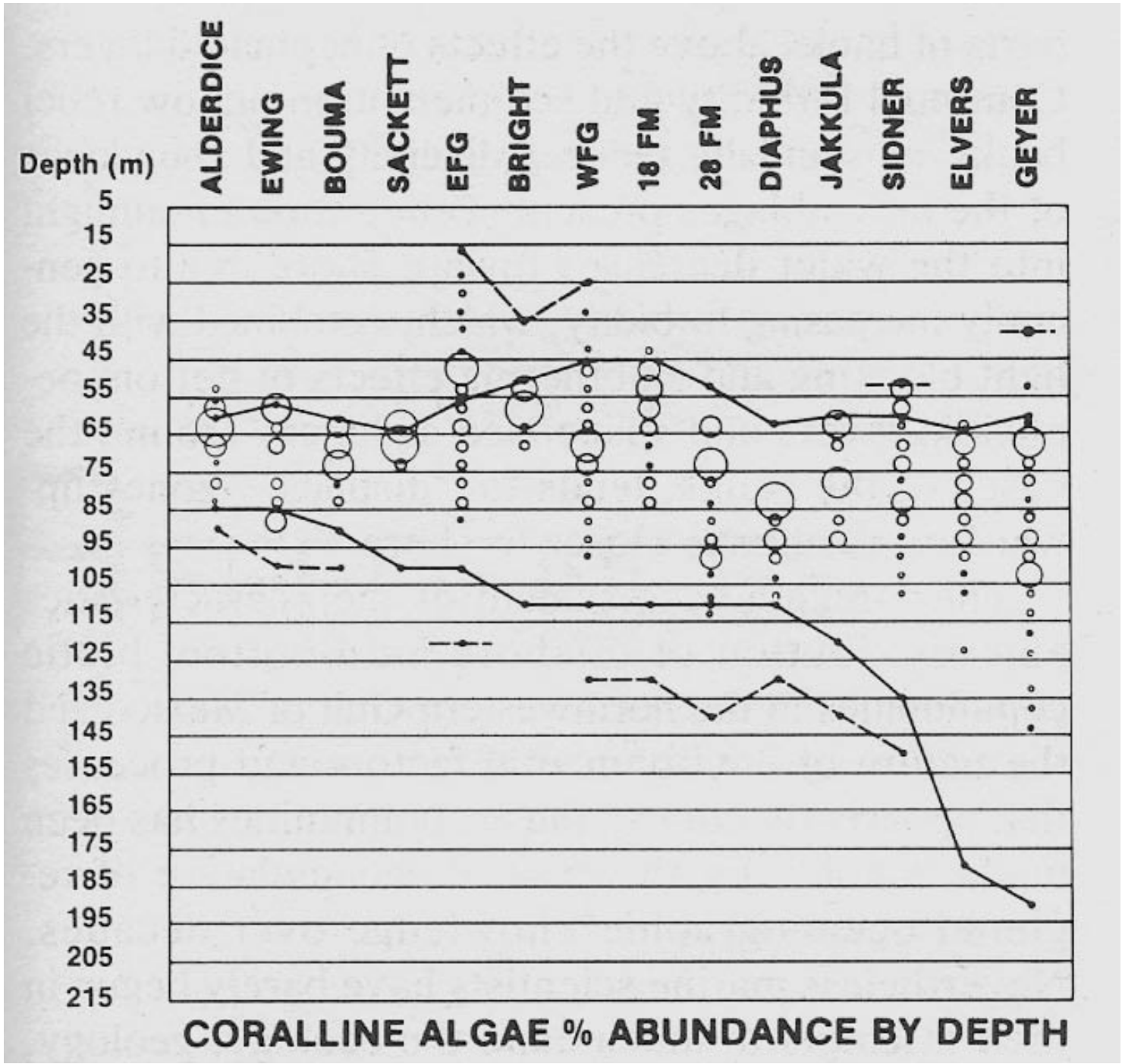

Depth (m)
5
15
25
35
45
55
65
75
85
95
105
115
125
135
145
155
165
175
185
195
205
215
ALDERDICE
EWING
BOUMA
SACKETT
EFG
BRIGHT
WFG
18 FM
28 FM
DIAPHUS
JAKKULA
SIDNER
ELVERS
GEYER
CORALLINE ALGAE % ABUNDANCE BY DEPTH

TABLE 7.1. Depth Ranges (in meters) of Biotic Zones on Outer Continental Shelf Hard Banks in the Northwestern Gulf of Mexico

Banks	Biotic Zones							
	Millepora Sponge	*Diploria-Montastrea-Porites*	*Madracis*	*Stephano-coenia*	Algal-Sponge	Antipatharian-Transitional	Nepheloid	Soft Bottom
Claypile	40–45						45+	50+
Sonnier	18–52						52+	60+
Stetson	20–52						52+	62–64+
Small Adam						60?	P[a]	64+
Big Adam						60?	P[a]	66+
North Hospital						58–70	70+	68–70+
Aransas						57–70	70+	70–72+
Baker						56–70	70+	70–74+
Blackfish						60?	P[a]	70–74+
Hospital Rock						59–70	70+	70–74+
Mysterious						70?	P[a]	74–86+
Southern						58–70	70+	80+
Dream						62–70	70+	80+
South Baker						59–70	70+	80–84+
32 Fathom						52?	P[a]	55+
Coffee Lump						62–68	68+	70+
Fishnet						66–73	73+	78+
Alderdice					55–67	67–82	82+	84–90+
Ewing					56–72	72–80	80+	85–100+
Bouma					60–75	75–84	84+	90–100+
Parker					60–82	82–?	P[a]	100+
Sackett					67–82[b]	65–85	85+	100+
East Flower Garden		15–36	28–46	36–52	46–82	82–86	86+	100–120+
Applebaum					76?	P[a]	P[a]	100–120+
Bright				37	52–74	74–?	P[a]	110+
West Flower Garden		20–36	P[a]	36–50	46–88	88–89	89+	110–130+
Diaphus						73–98	98+	110–130+
18 Fathom				45–47	45–82	82–?	P[a]	110–130+
28 Fathom					52–92	92–100	100+	110–140+
Jakkula					59–90	90–98	98+	120–140+
Rezak–Sidner					55–93	93–100	100+	120–150+
Sweet					75–80+	P[a]	P[a]	130–200+
Elvers					60–97	97–123?	123+	180+
Geyer	37–52				60–98	98–123?	123+	190–210+
Phleger						?	122+[c]	200+

[a]P = Zone present, but depth range uncertain.

[b]Weakly represented, stressed.

[c]Clear water, but biota typical of nepheloid zone.

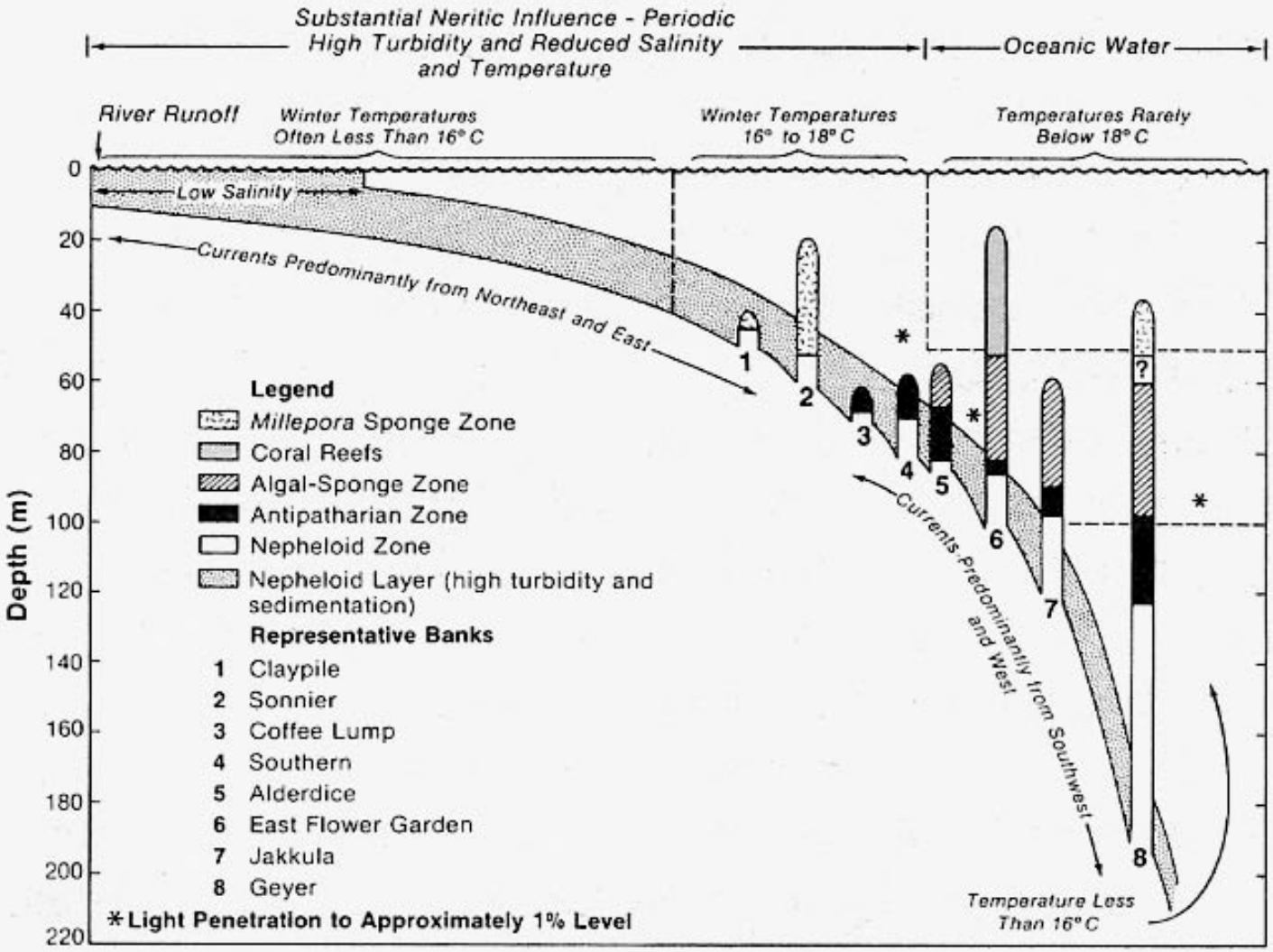
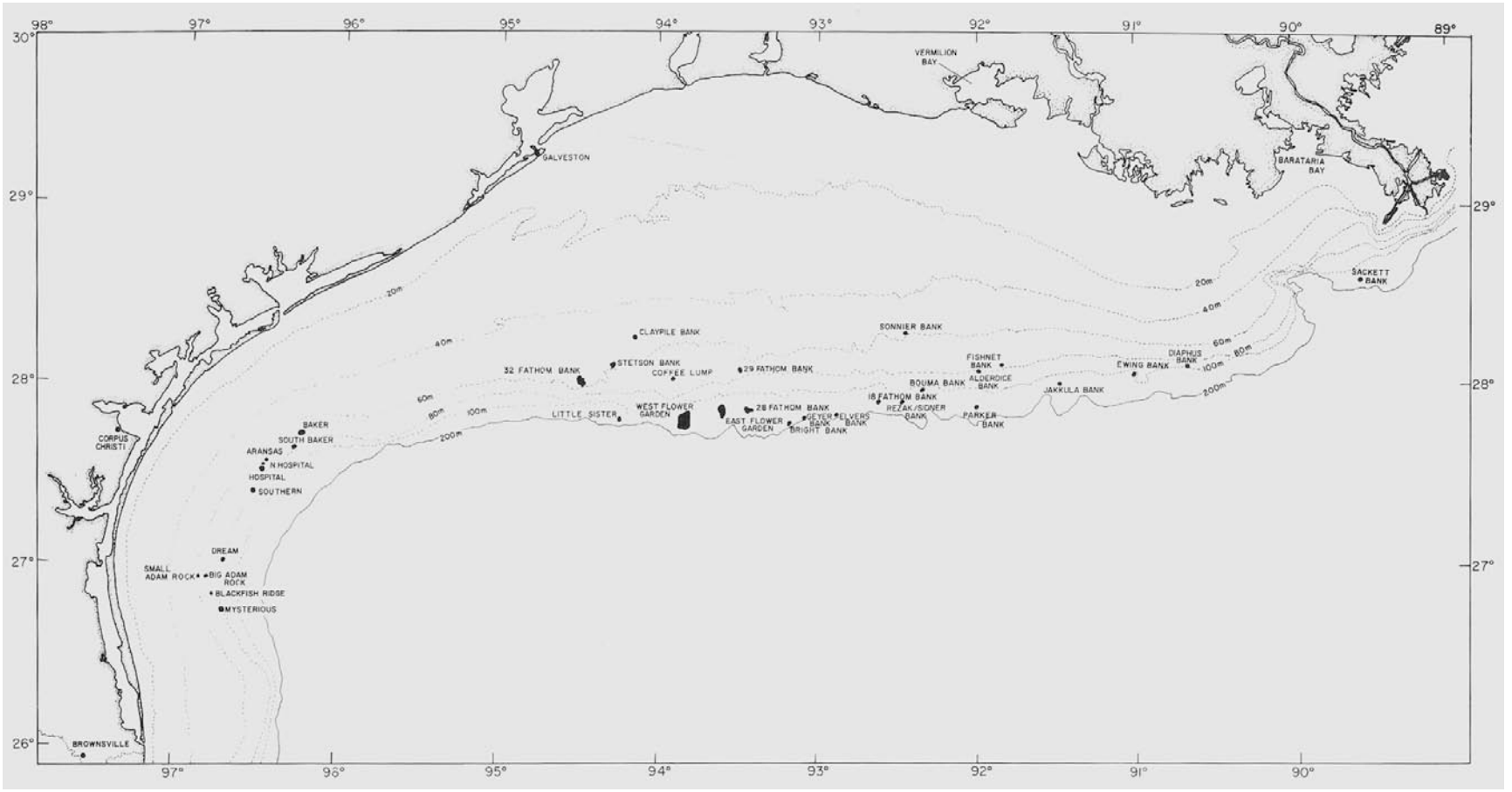


Figure 7.43. Distribution of biotic zones relative to conditions of temperature, salinity, turbidity, and light at selected banks.


98°
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95°
94°
93°
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91°
90°
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30°
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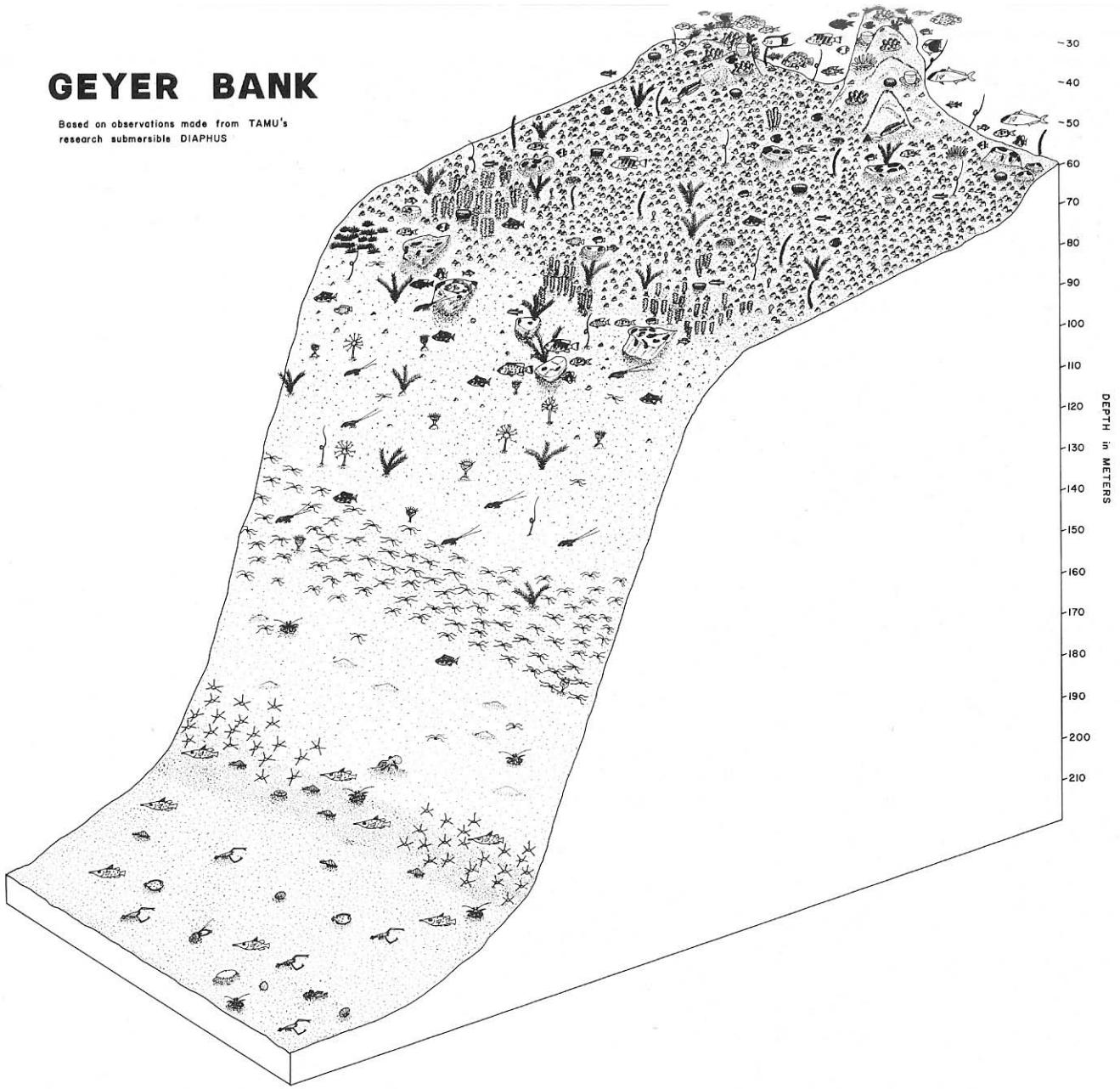
27°
26°
VERMILION BAY
GALVESTON
BARATARIA BAY
SACKETT BANK
20m
40m
60m
80m
100m
200m
CLAYPILE BANK
SONNIER BANK
32 FATHOM BANK
STETSON BANK
COFFEE LUMP
29 FATHOM BANK
FISHNET BANK
ALDERDICE BANK
DIAPHUS BANK
EWING BANK
BOUMA BANK
JAKKULA BANK
18 FATHOM BANK
REZAK/SIGNER BANK
PARKER BANK
LITTLE SISTER
WEST FLOWER GARDEN
28 FATHOM BANK
EAST FLOWER GARDEN
GEYER BANK
ELVERS BANK
BRIGHT BANK
CORPUS CHRISTI
BAKER
SOUTH BAKER
ARANSAS
N HOSPITAL
HOSPITAL
SOUTHERN
DREAM
SMALL ADAM ROCK
BIG ADAM ROCK
BLACKFISH RIDGE
MYSTERIOUS
BROWNSVILLE

GEYER BANK

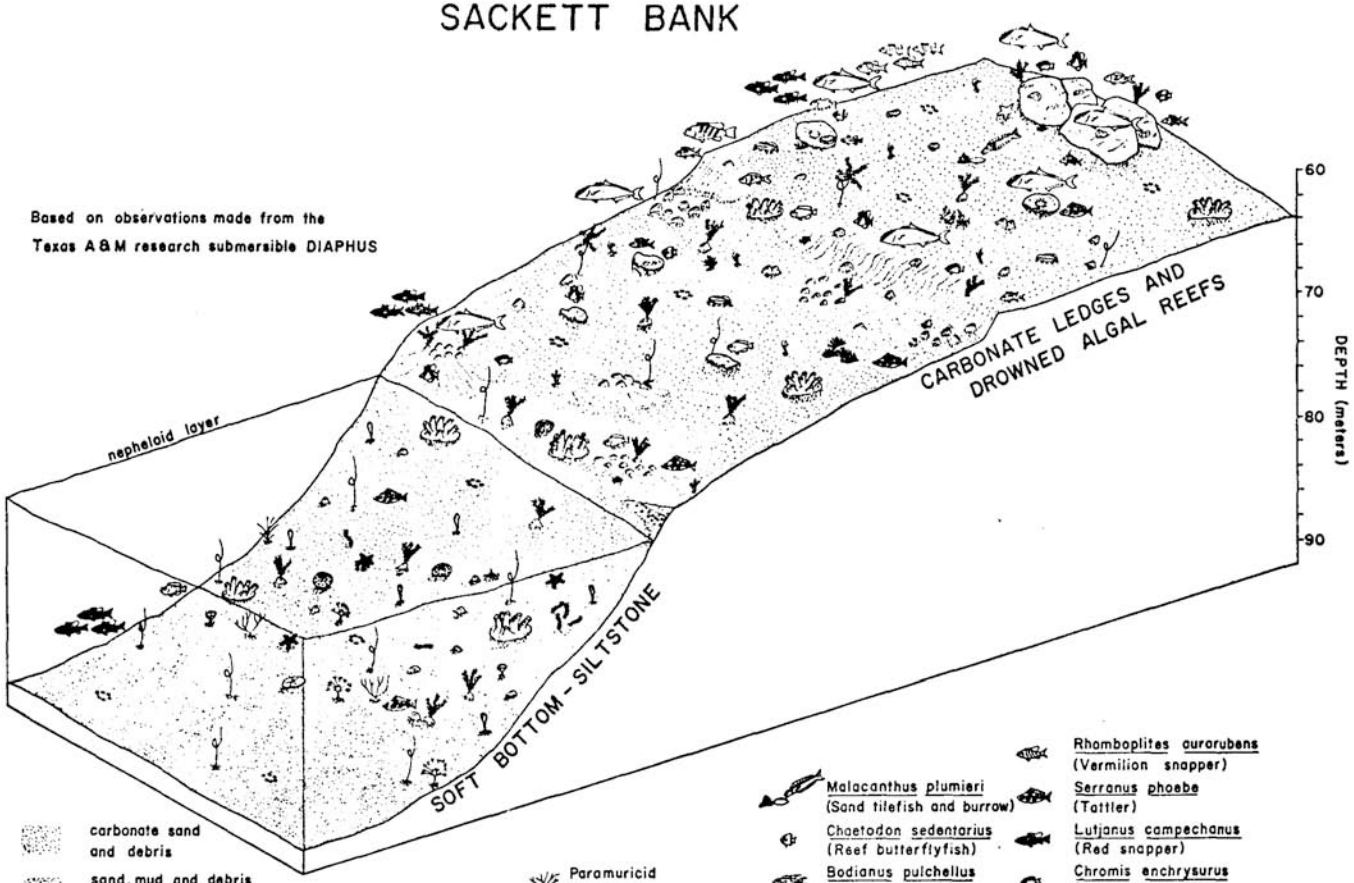
Based on observations made from TAMU's research submersible DIAPHUS

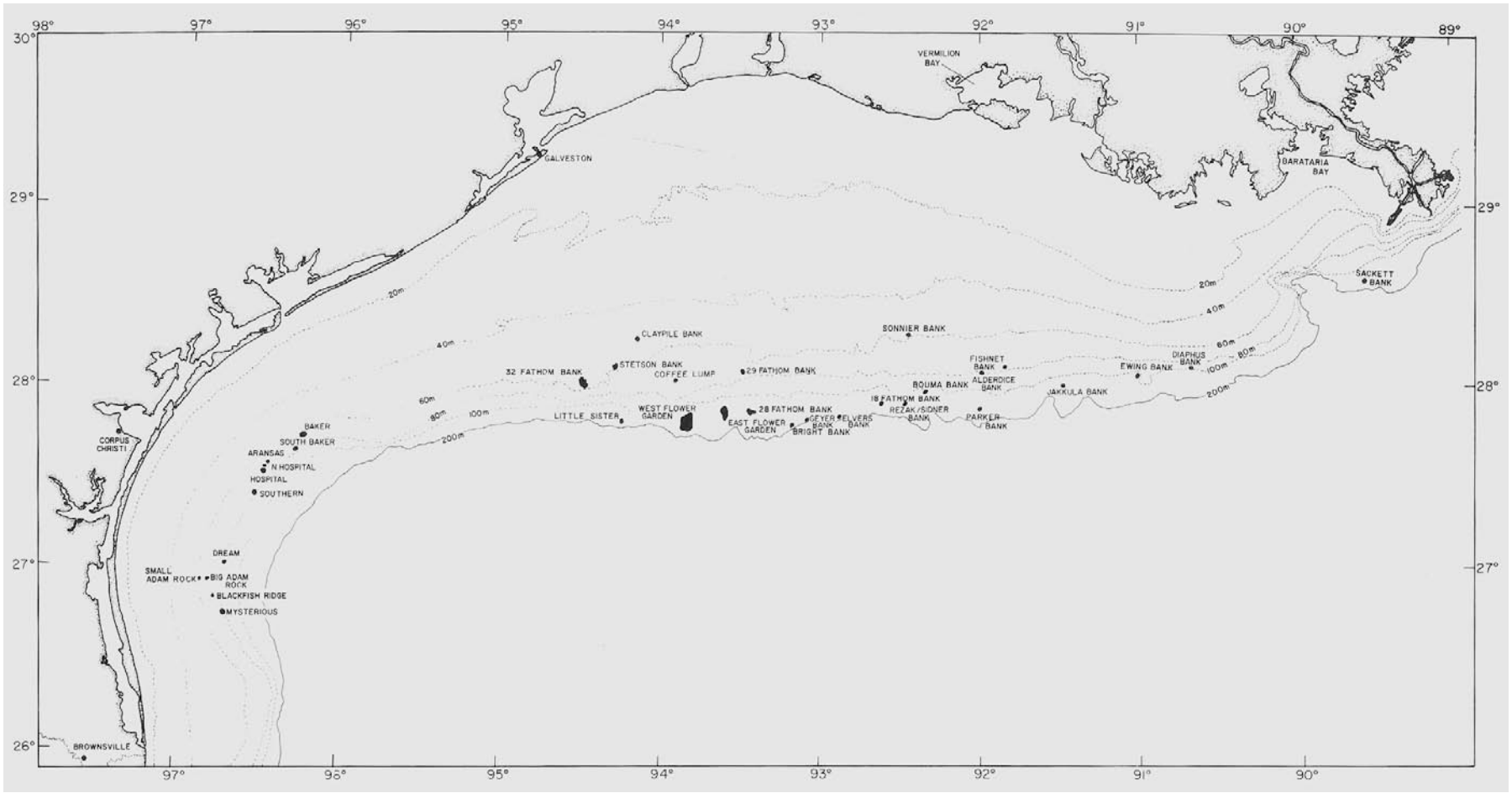


- silt and clay
- sand and rubble
- coralline algal nodules with living coralline algae
- drowned reefs
- Cirripathes (antipatharian)
- Oxysmilia (solitary coral)
- Paramuricidae (sea fan)
- saucer shaped agariciid coral
- elisellid (sea whip)
- comatulid crinoids (small)
- comatulid crinoids (large)
- Nidalia (octocoral)
- Madracis (coral)
- Condylactis (anemone)
- sponge
- sponge
- Neofibularia (sponge)
- vermetid–sponge association
- Astropyga (urchin)
- ophiuroid (brittle star)
- urchin
- Clypeaster (sand dollar)
- Murex (gastropod)
- scallop
- Spondylus americanus (American thorny oyster)
- Octopus
- Paguridae (hermit crab)
- Galatheidae (crab)
- Myropsis (crab)
- Parapandalus sp. (shrimp)

- Centropyge argi (Cherubfish)
- Chromis enchrysurus (Yellowtail reeffish)
- Chromis multilineatus (Brown chromis)
- Priacanthidae (Bigeye)
- Canthigaster rostrata (Sharpnose puffer)
- Paranthias furcifer (Creolefish)
- Holacanthus tricolor (Rock beauty)
- Holacanthus bermudensis (Blue angelfish)
- Melichthys niger (Black durgon)
- Epinephelus inermis (Marbled grouper)
- Epinephelus niveatus (Snowy grouper)
- Mycteroperca spp. (groupers)
- Liopropoma eukrines (Wrasse bass)
- Malacanthus plumieri (Sand tilefish and burrow)
- Chaetodon sedentarius (Reef butterflyfish)
- Chaetodon aya (Bank butterflyfish)
- Bodianus pulchellus (Spotfin hogfish)
- Serranus phoebe (Tattler)
- Gonioplectrus hispanus (Spanish flag)
- Rhomboplites aurorubens (Vermilion snapper)
- Lutjanus campechanus (Red snapper)
- Macrorhamphosidae (Snipefish)
- Triglidae (sea robin)
- Soleidae (solefish)
- Holanthias martinicensis (Roughtonge bass)
- Seriola dumerili (Greater amberjack)
- Sphyraena barracuda (Barracuda)

SACKETT BANK

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VERMILION BAY
GALVESTON
BARATARIA BAY
SACKETT BANK
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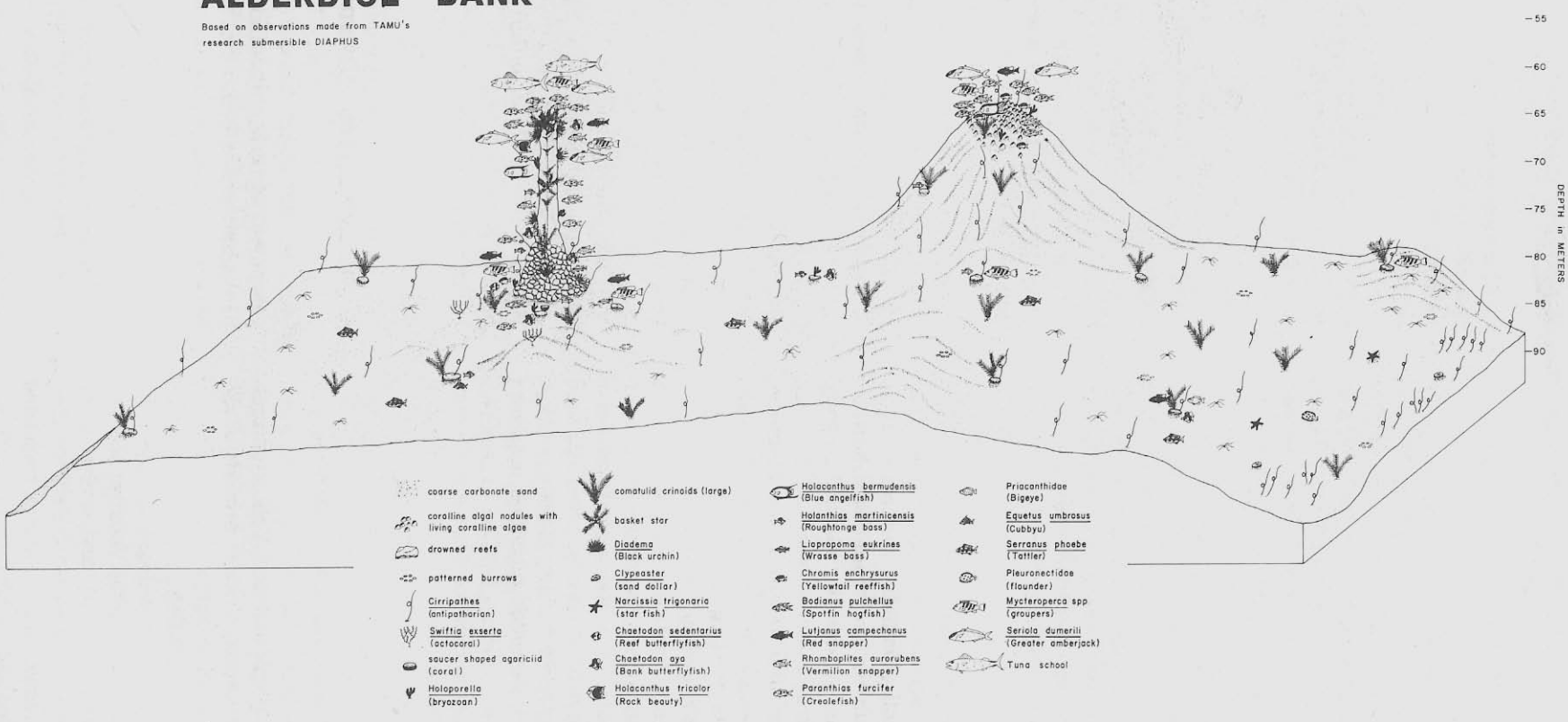
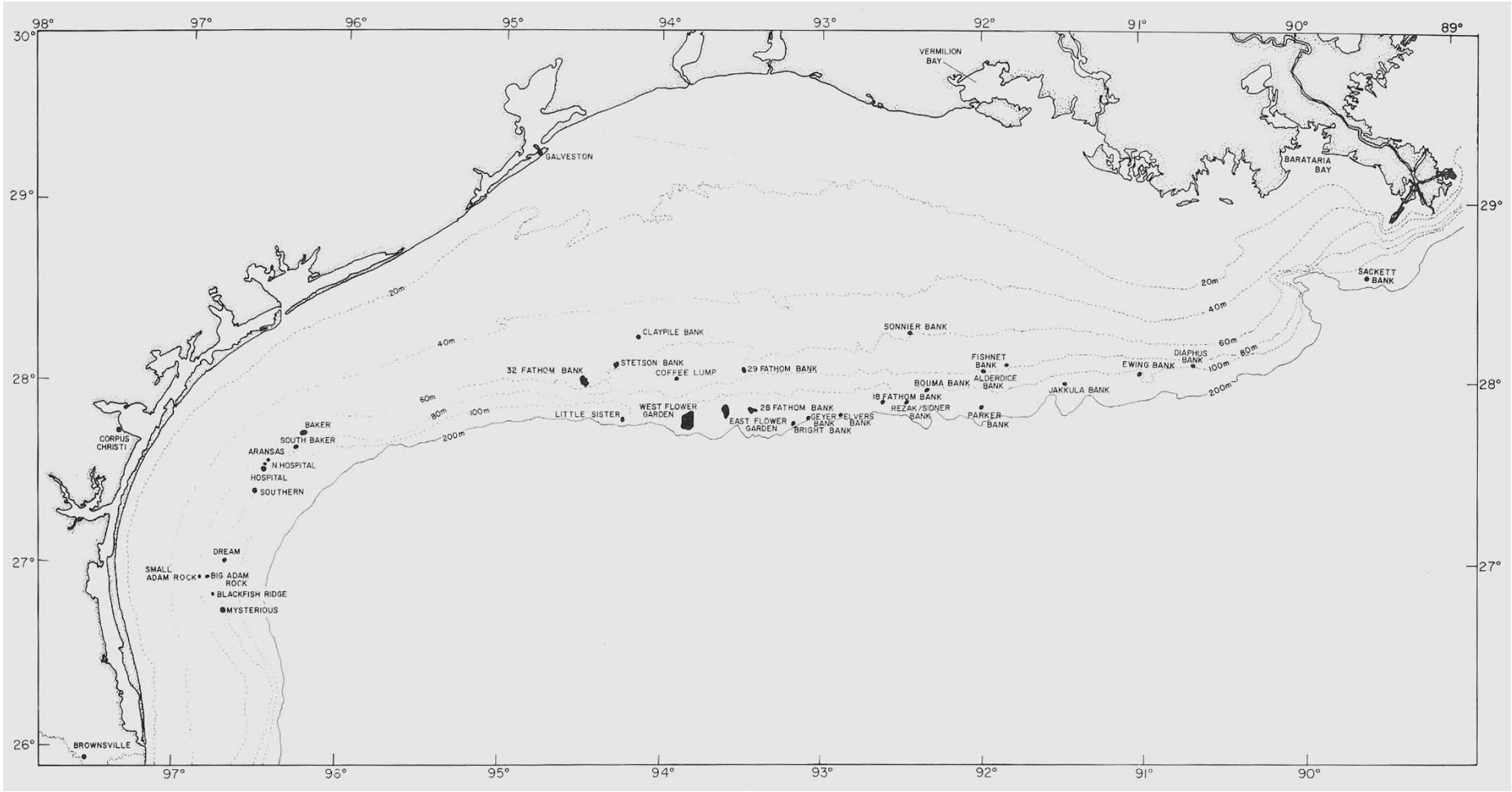
CLAYPILE BANK
SONNIER BANK
FISHNET BANK
DIAPHUS BANK
EWING BANK
ALDERICE BANK
JAKKULA BANK
32 FATHOM BANK
STETSON BANK
COFFEE LUMP
29 FATHOM BANK
BOUMA BANK
18 FATHOM BANK
REZAK/SIDNER BANK
PARKER BANK
LITTLE SISTER
WEST FLOWER GARDEN
28 FATHOM BANK
EAST FLOWER GARDEN
GEYER BANK
ELVERS BANK
BRIGHT BANK
CORPUS CHRISTI
BAKER
SOUTH BAKER
ARANSAS
N HOSPITAL
HOSPITAL
SOUTHERN
DREAM
SMALL ADAM ROCK
BIG ADAM ROCK
BLACKFISH RIDGE
MYSTERIOUS
BROWNSVILLE

ALDERDICE BANK

Based on observations made from TAMU's research submersible DIAPHUS

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VERMILION BAY
GALVESTON
BARATARIA BAY
SACKETT BANK
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CLAYPILE BANK
SONNIER BANK
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STETSON BANK
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SOUTH BAKER
CORPUS CHRISTI
ARANSAS
N. HOSPITAL
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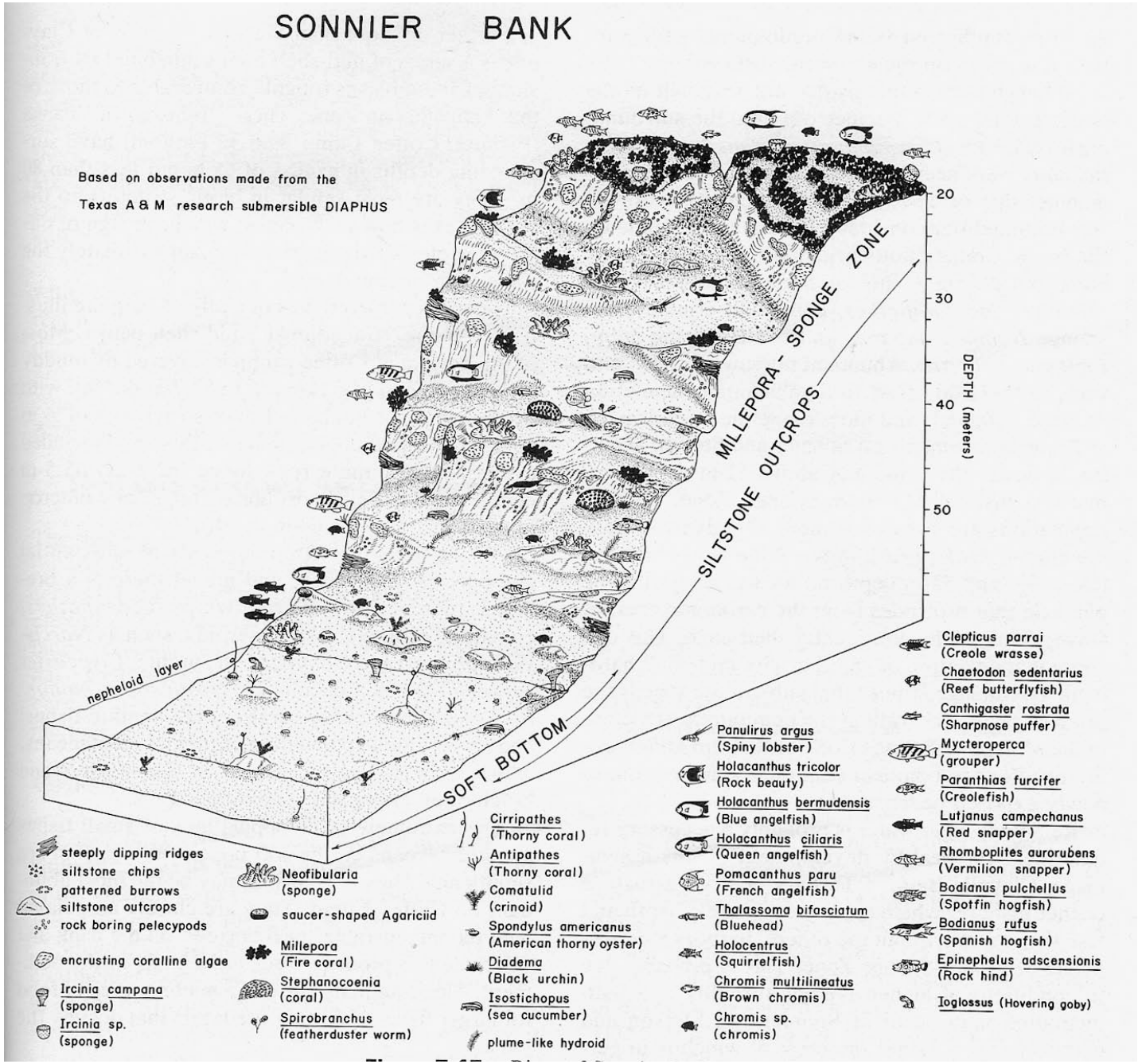
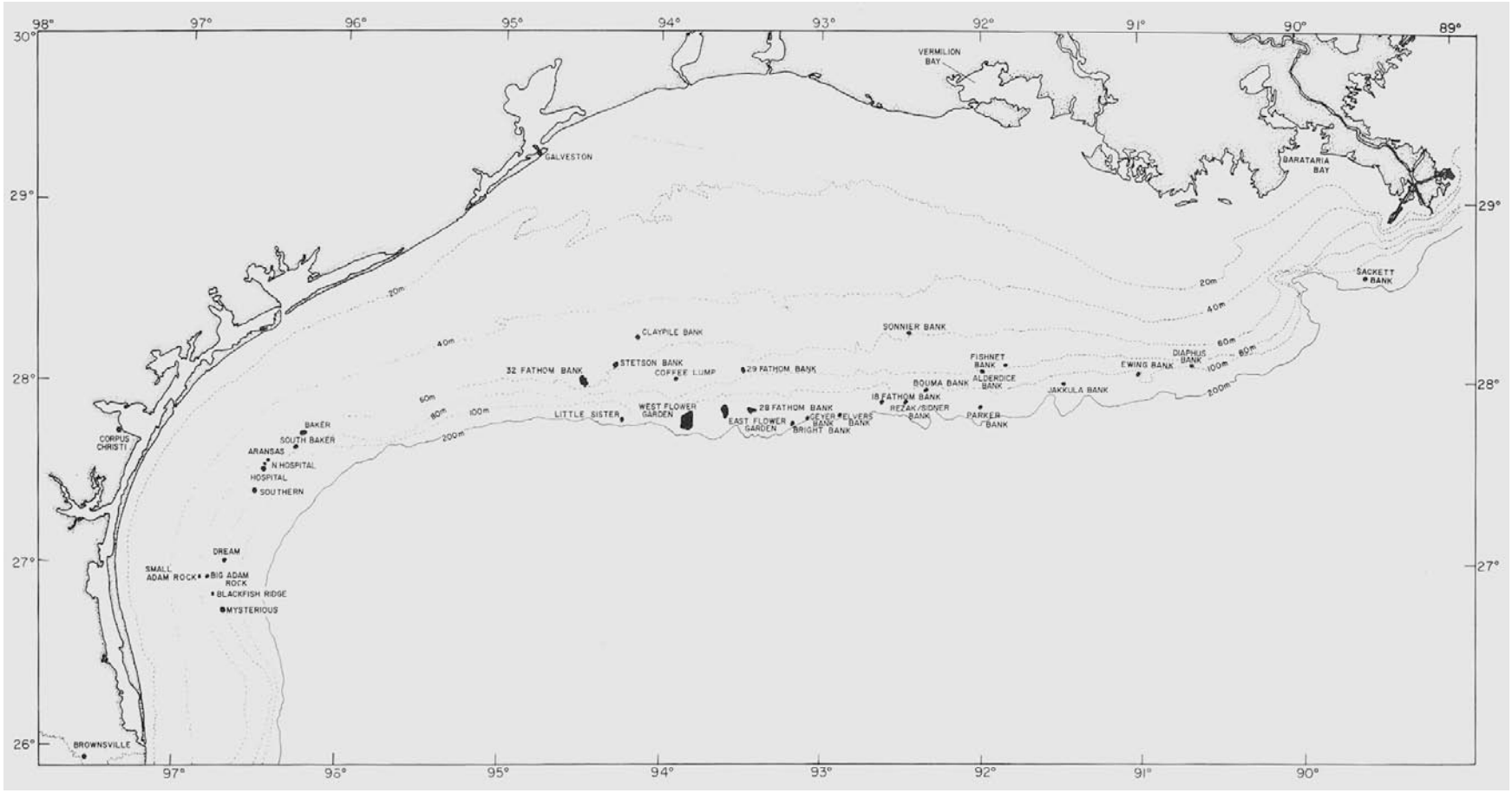
DREAM
SMALL ADAM ROCK
BIG ADAM ROCK
BLACKFISH RIDGE
MYSTERIOUS
BROWNSVILLE


SONNIER BANK
Based on observations made from the
Texas A & M research submersible DIAPHUS
20
30
40
50
DEPTH (meters)
MILLEPORA - SPONGE ZONE
SILTSTONE OUTCROPS
SOFT BOTTOM
nepheloid layer
steeply dipping ridges
siltstone chips
patterned burrows
siltstone outcrops
rock boring pelecypods
encrusting coralline algae
Ircinia campana (sponge)
Ircinia sp. (sponge)
Neofibularia (sponge)
saucer-shaped Agariciid
Millepora (Fire coral)
Stephanocoenia (coral)
Spirobranchus (featherduster worm)
Cirripathes (Thorny coral)
Antipathes (Thorny coral)
Comatulid (crinoid)
Spondylus americanus (American thorny oyster)
Diadema (Black urchin)
Isostichopus (sea cucumber)
plume-like hydroid
Panulirus argus (Spiny lobster)
Holacanthus tricolor (Rock beauty)
Holacanthus bermudensis (Blue angelfish)
Holacanthus ciliaris (Queen angelfish)
Pomacanthus paru (French angelfish)
Thalassoma bifasciatum (Bluehead)
Holocentrus (Squirrelfish)
Chromis multilineatus (Brown chromis)
Chromis sp. (chromis)
Clepticus parrai (Creole wrasse)
Chaetodon sedentarius (Reef butterflyfish)
Canthigaster rostrata (Sharpnose puffer)
Mycteroperca (grouper)
Paranthias furcifer (Creolefish)
Lutjanus campechanus (Red snapper)
Rhomboplites aurorubens (Vermilion snapper)
Bodianus pulchellus (Spotfin hogfish)
Bodianus rufus (Spanish hogfish)
Epinephelus adscensionis (Rock hind)
Ioglossus (Hovering goby)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VERMILION BAY
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GEYER BANK
ELVERS BANK
BRIGHT BANK
REZAK/SIDNER BANK
PARKER BANK
CORPUS CHRISTI
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SOUTH BAKER
ARANSAS
N HOSPITAL
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SOUTHERN
DREAM
SMALL ADAM ROCK
BIG ADAM ROCK
BLACKFISH RIDGE
MYSTERIOUS
BROWNSVILLE

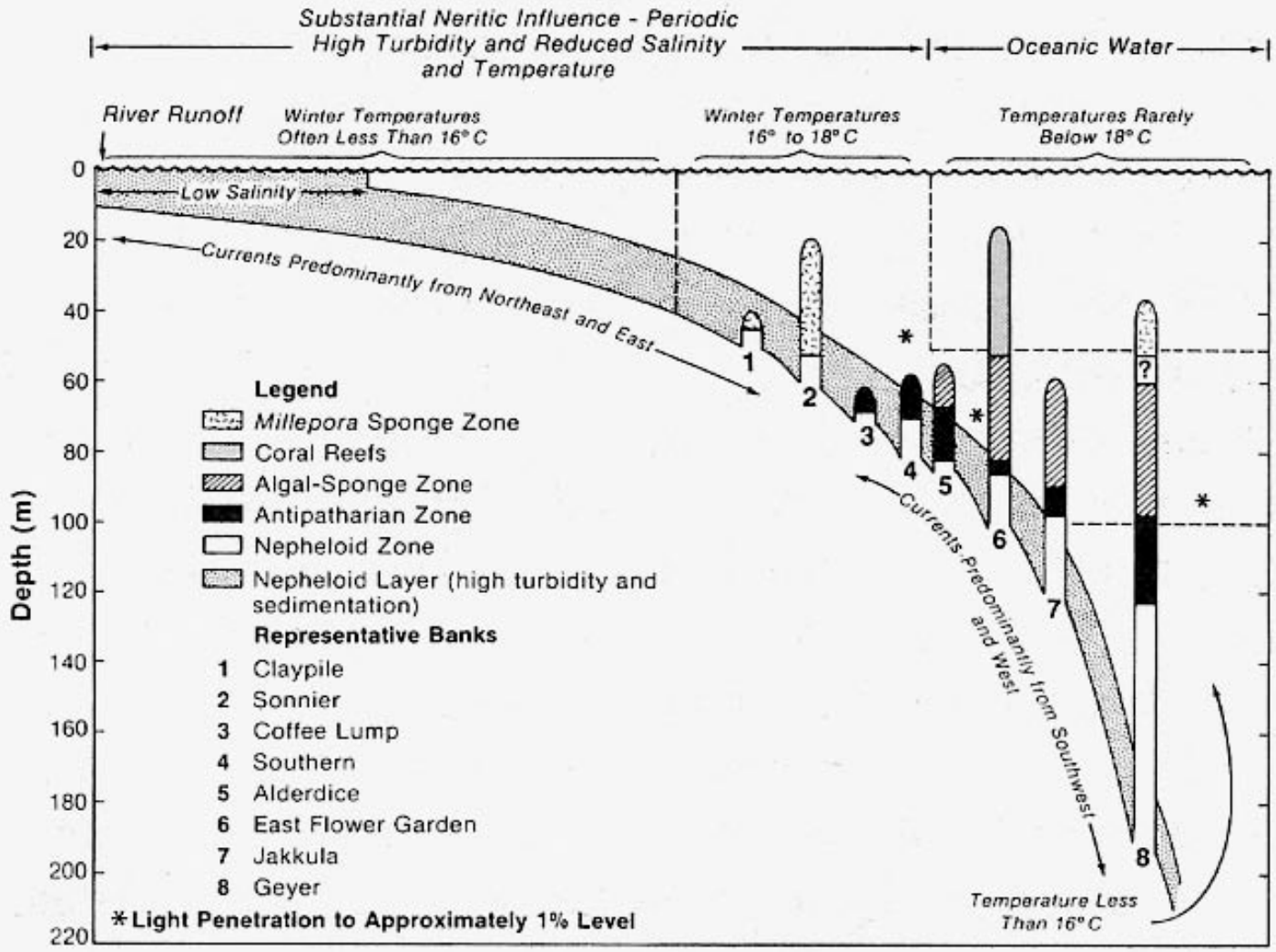
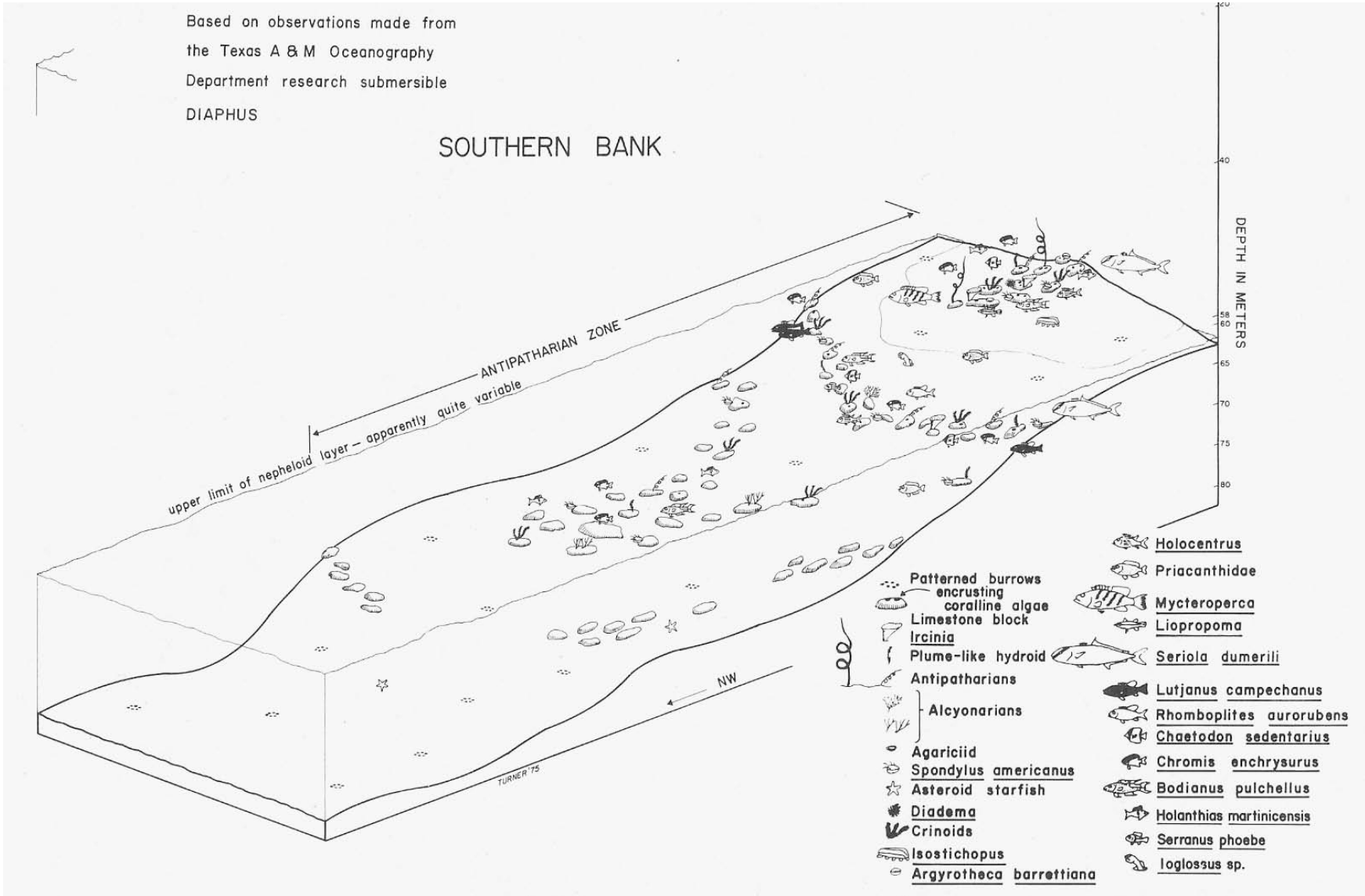
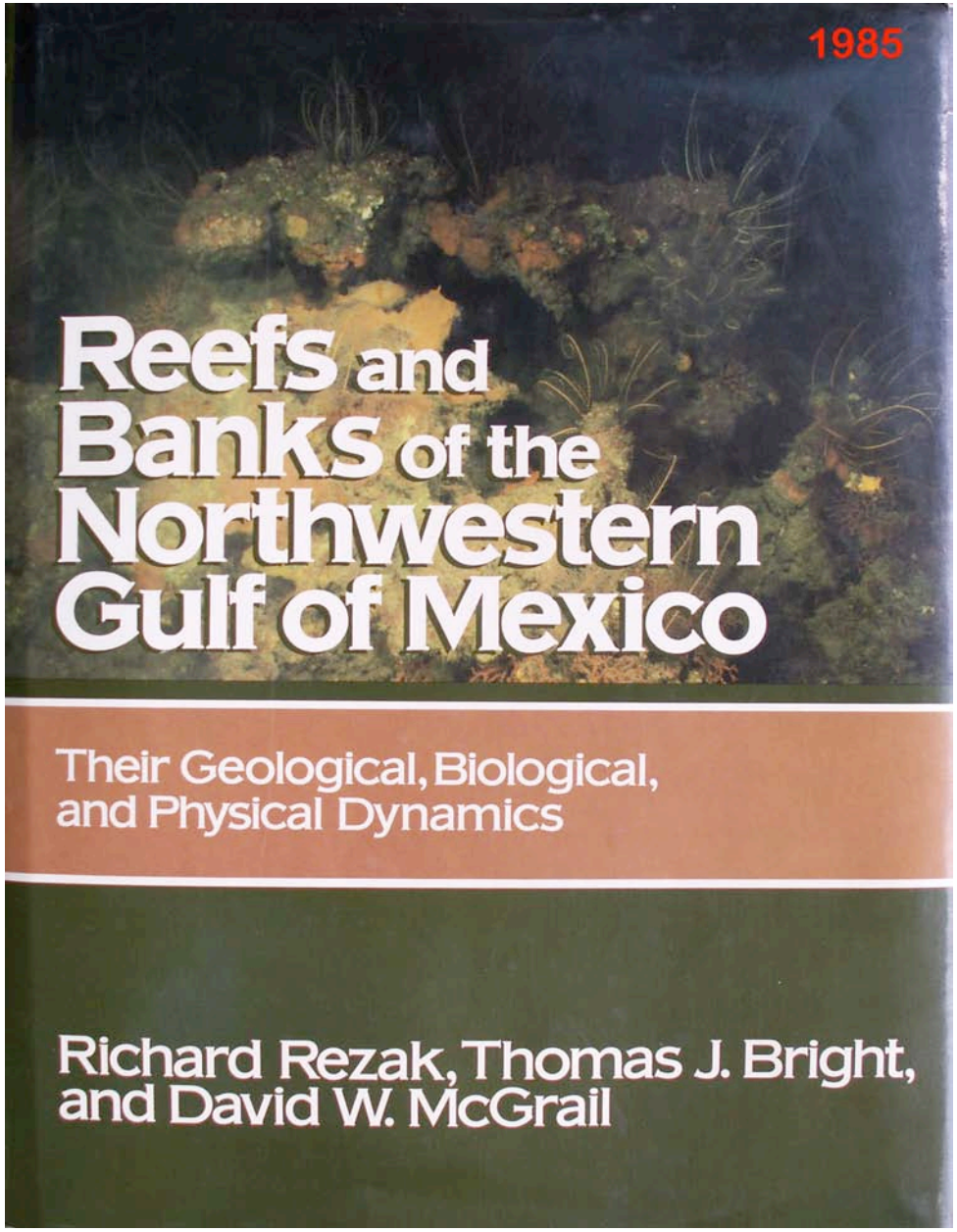


Figure 7.43. Distribution of biotic zones relative to conditions of temperature, salinity, turbidity, and light at selected banks.


Based on observations made from
the Texas A & M Oceanography
Department research submersible
DIAPHUS
SOUTHERN BANK
ANTIPATHARIAN ZONE
upper limit of nepheloid layer – apparently quite variable
NW
TURNER '75
DEPTH IN METERS
40
58
60
65
70
75
80
Patterned burrows
encrusting coralline algae
Limestone block
Ircinia
Plume-like hydroid
Antipatharians
Alcyonarians
Agariciid
Spondylus americanus
Asteroid starfish
Diadema
Crinoids
Isostichopus
Argyrotheca barrettiana
Holocentrus
Priacanthidae
Mycteroperca
Liopropoma
Seriola dumerili
Lutjanus campechanus
Rhomboplites aurorubens
Chaetodon sedentarius
Chromis enchrysurus
Bodianus pulchellus
Holanthias martinicensis
Serranus phoebe
Ioglossus sp.


1985
Reefs and Banks of the Northwestern Gulf of Mexico
Their Geological, Biological, and Physical Dynamics
Richard Rezak, Thomas J. Bright, and David W. McGrail

Based on the nature, distribution, and degree of development of their epibenthic communities, hard banks on the Texas–Louisiana Outer Continental Shelf can be divided into six environmental groups

1. South Texas mid-shelf relict Pleistocene carbonate reefs that bear turbidity-tolerant Antipatharian Zones and Nepheloid Zones (surrounding depths of 60 to 80 m; crests 56 to 70 m): Mysterious, Small Adam, Blackfish, Big Adam, Dream, Southern, North Hospital, Hospital, Aransas, South Baker, and Baker.
2. North Texas–Louisiana mid-shelf Tertiary outcrop banks that bear clear-water *Millepora*-Sponge Zones and turbid-water-tolerant Nepheloid Zones (surrounding depths of 50 to 62 m; crests 18 to 40 m): Stetson, Claypile, Sonnier.
3. North Texas–Louisiana mid-shelf banks that bear turbidity-tolerant assemblages approximating the Antipatharian Zone (surrounding depths of 65 to 78 m; crests 52 to 66 m): 32 Fathom, Coffee Lump, Fishnet.
4. North Texas–Louisiana shelf-edge carbonate banks that bear clear-water coral reefs, clear-water Algal Sponge Zones, transitional assemblages approximating the Antipatharian Zone, and Nepheloid Zones (surrounding depths of 84 to 200 m; crests 15 to 75 m): Appelbaum, East Flower Garden, West Flower Garden, 28 Fathom, Bright, Geyer, Elvers, 18 Fathom, Bouma, Rezak–Sidner, Parker, Sweet, Alderdice, Jakkukla, Ewing.
5. Eastern Louisiana shelf-edge carbonate banks that bear poorly developed elements of the Algal-Sponge Zone, transitional Antipatharian Zone assemblages, and Nepheloid Zones (surrounding depths of 100 to 110 m; crests 67 to 73 m): Diaphus, Sackett.
6. Extreme shelf-edge banks with crest depths too deep to permit the development of light-dependent, reef-building communities but which support elements of transitional Antipatharian Zone and Nepheloid Zone assemblages (crests deeper than 100 m, surrounding depths 200 m or more): Phleger.