

Coral Health and Monitoring Program (CHAMP)

FY 2001 Progress Report: October 17, 2001

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CHAMP Program Background

Began in August, 1994

**Started through funding from Office of Global Programs
Continues through funding from OAR, NMFS and NOS**

Consists of several efforts

Web Page (<http://www.coral.noaa.gov>)

Coral-list listserver

Near real-time *in situ* data acquisition and distribution

***In situ* data quality screening and interpretation,
through artificial intelligence techniques**

Partnerships include

NOAA: NESDIS, NOS, NMFS, NURP, NDBC

Federal: NPS, USGS, FWS

Foreign: AIMS, GBRMPA

Academic: FIO, UM/RSMAS, FIU, NSU, USF

Private: World Bank/GEF



CHAMP Web Page Background

First coral-related Web Page

Currently resides on ancient (1994) IRIX SGI server

Still receives 6,000 to 10,000 “hits” per day

Source of information for...

Literature abstracts

Links

Online Researchers Directory

Near real-time data

Coral assessment methods and protocols

Coral reef maps

A bunch more stuff...



CHAMP Server and Web Progress

CHAMP pages and coral-list migrating to new Beowulf Linux cluster

Beowulf cluster now serving ReefCheck, GCRMN, NURP/CMRC, RSMAS/AGRRA and RSMAS/NCORE Web Pages

Adding new Oracle Server to Beowulf for coral data

Redesigning and improving CHAMP Web Page content

Continually adding new literature abstracts

Integrating with new NOAA/CoRIS Web Page



Beowulf Cluster Specifications

Overview: 8 node Beowulf Class cluster. 3.75GFlops benchmark. 1Gigabit networking between nodes. Switch is a D-Link Gigabit managed switch.

Master Node: Dual 733Mhz, 1 GB RAM, Single SCSI 160 40 GB drive, 4 SCSI 160 70 GB Drives configured in a software RAID 5. 1 Gigabit NIC and 1 10/100 NIC.

Slaves: Dual 733 MHz, 1 GB of RAM, 3 Quantum 20 GB Drives, single gigabit NIC.

Backup: Quantum DLT 40/80 GB Backup.

Extremely good security configuration.



Coral-list Listserver

Currently serves 1,715 subscribers

International in scope

Researchers, conservationists, laymen (laypeople? laypersons?)

Academics

Government employees

Politicians

***De facto* method of mass communication among coral researchers**

Research programs

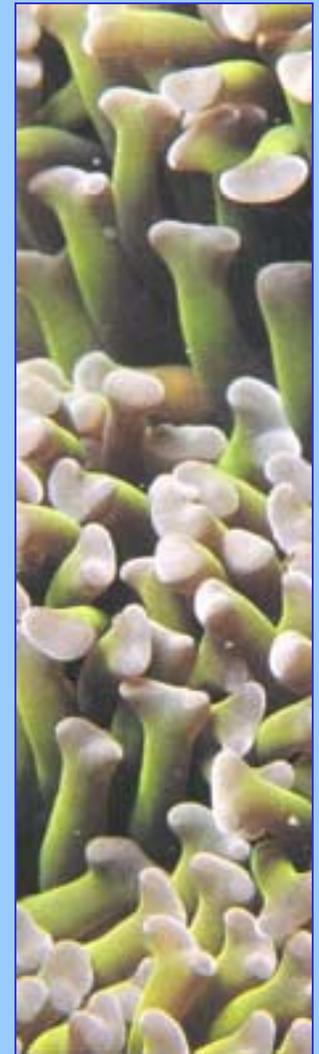
Job listings

Calls for proposals

International meetings

Bleaching, disease & spawning events

Major theme discussions (e.g., “Are coral reefs doomed?”)



Coral Reef Early Warning System (CREWS)

Coral Reef Watch collaboration with NESDIS (Dr. Al Strong)

CREWS stations are suite of meteorological and oceanographic monitoring instruments, plus the expert system software for data screening and interpretation

Response to Coral Reef Task Force Monitoring Group's recommendation for a network of up to 18 stations at all major U.S. coral reef areas by 2006

CREWS stations provide hourly *in situ* data...

Air temperature, wind speed and direction, barometric pressure, UV-B above and below the water, PAR above and below water, sea temperature, salinity, and tide level (optional: pCO₂, fluorometry, transmissometry, nutrients, acoustic monitoring, Web cam, etc.)

...and information synthesis products

Ground-truth for NESDIS satellite temps, coral bleaching alerts, data quality alerts; and matching patterns as proscribed by biologists, oceanographers and the public (fish & invertebrate spawning, migration, bloom conditions, good fishing and/or diving conditions, etc.



Atlantic CRTF/CREWS Stations Planned

Lee Stocking Island, Bahamas (test-bed) (1)

US Virgin Islands (2)

Puerto Rico (2)

Pacific CRTF/CREWS Stations Planned

Hawaii (6)

American Samoa (2)

Guam (1)

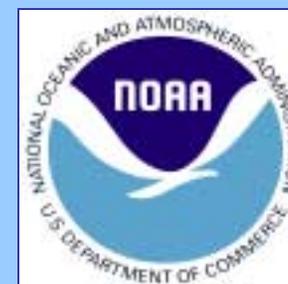
CN Mariana Islands (2)

Johnston Atoll (1)

Howland/Baker (1)

Palmyra/Kingman (1)

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**Permits required!! CZM, ACOE, F&W, USCG, etc.**



# CREWS Station (test bed platform) at Rainbow Gardens Reef, Lee Stocking Island, Bahamas

Installed May, 2001

NURP/CMRC collaborative facilitates pioneering work

Site and design are for testing new instruments

Continuous (hourly) output of data

Archived & raw data will be available via Oracle server

CREWS software screening

Coral bleaching alerts

AVHRR ground-truth information products

Alerts to instrument problems

Data of use to large number of researchers who visit

Data complement decades of previous studies

Data of use in upcoming (proposed) mini-symposium on

role of UV-B and light in coral bleaching

Station was prototype floating design, however...



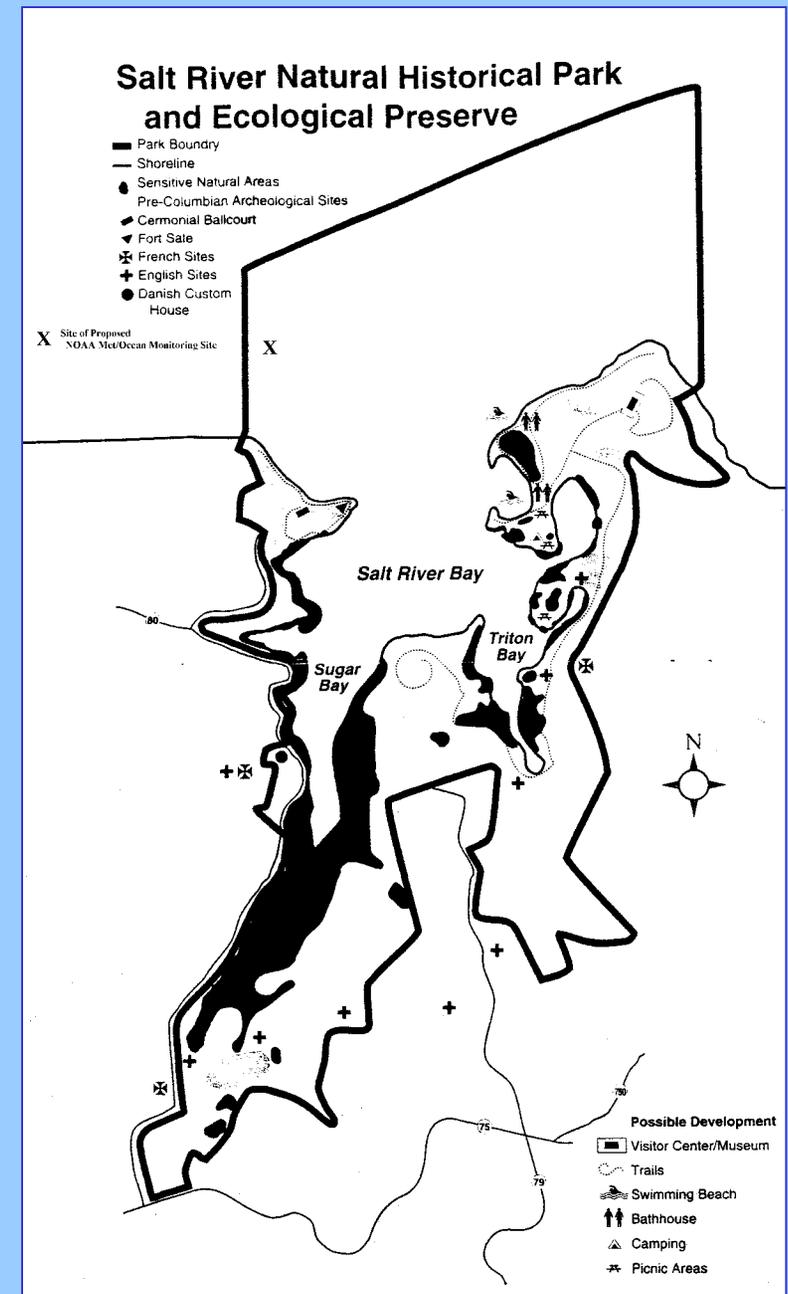
*R/V Kristina*

## Actual example of instrument alert:

“Probable UVB-1m sensor malfunction at cmrc1 on day 287, because readings (about 2319) appear too high around 0300 to 0900 hrs GMT.”

New station being built for St. Croix, in  
US Virgin Islands will have newer, sleek design.

- \* Near Salt River NHPEP
- \* NPS has expressed interest for additional stations near Buck Island and St. John
- \* UVI expressed interest in site near St. Thomas



# New CREWS station design

Hoistable platforms for safe maintenance

WindBird at NDBC 10m standard

Tide gauge is NOS standard

25' depth (but adjustable)

Built for heavy seas and winds

Has "give," rests on stainless steel ball

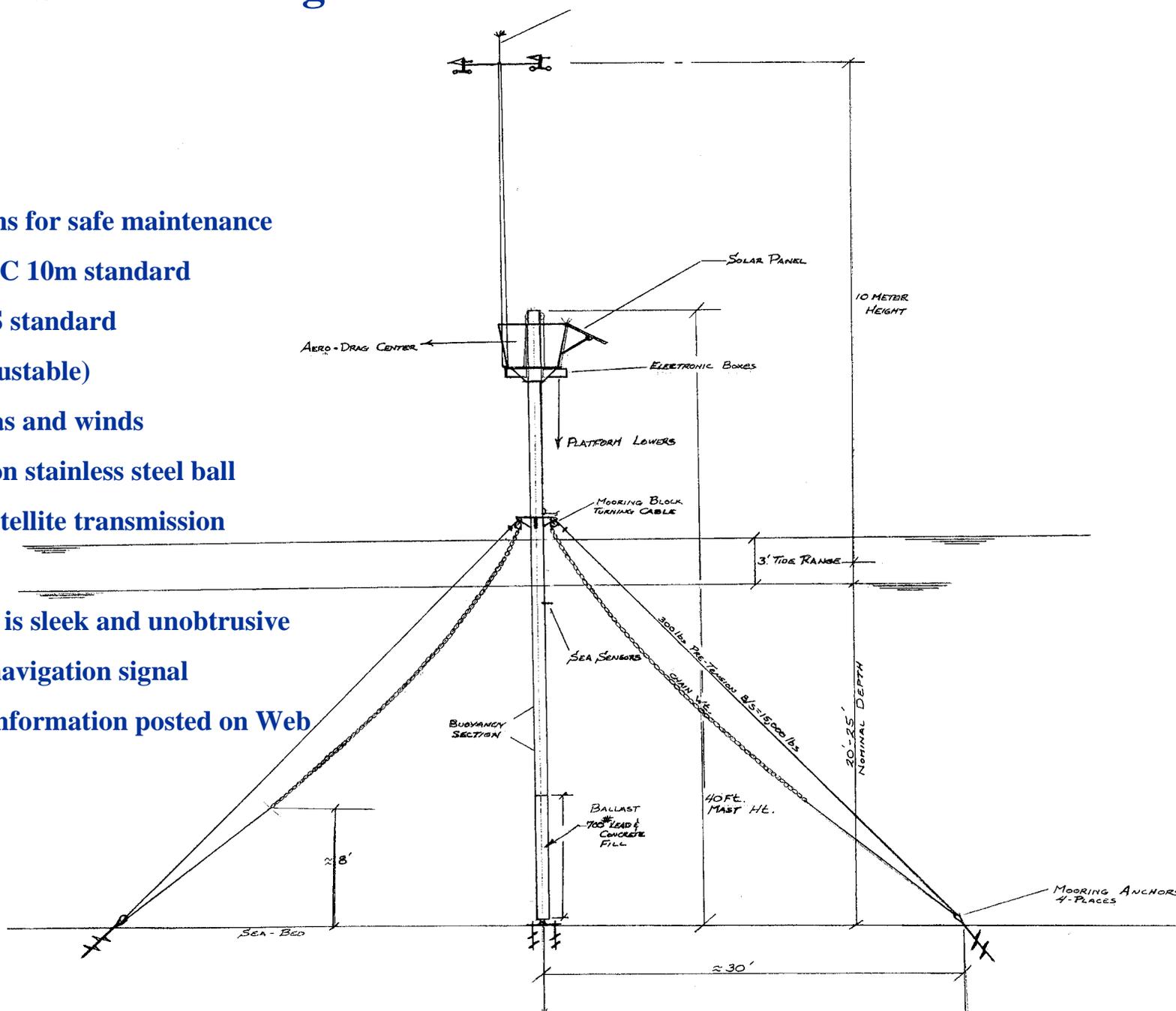
GOES (no cost) satellite transmission

Solar-powered

10" diameter spar is sleek and unobtrusive

USCG approved navigation signal

Hourly data and information posted on Web



# *Non-CRTF CREWS Stations*

**SEAKEYS Stations (in Florida Keys National Marine Sanctuary)**

**World Bank/Global Environmental Facility**

**Mainstreaming Adaptation to Climate Change (MACC) Project**

**Three new CREWS stations over next three years (more later)**

**Jamaica**

**Belize**

**Bahamas**

**Interest expressed for non-US islands in Pacific and Indian Oceans**

**French Polynesia**

**Seychelles**

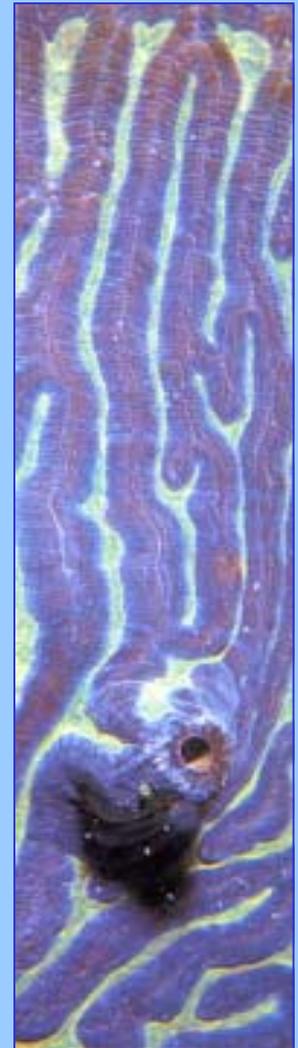
**Indonesia**

**Vietnam**



## *Other FY 2001 Accomplishments*

- \* **Coral bleaching alerts successful for Sombrero Key and GBR**
- \* **Collaborated with NMFS (Rusty Brainard) for installation of stations in NWHI**
- \* **Papers accepted for publication in peer-reviewed journals**
- \* **Presentations made for Senate staff, World Bank/GEF, AMLC, 9ICRS, etc.**
- \* **Continuing to help make CoRIS a success**
- \* **Press releases show NOAA/CRTF involvement**
- \* **Cooperative work with ReefCheck, ReefBase, NCORE, AGRRA, CMRC, etc.**



# *CRTF/CREWS Network Funding History & Plan*

**FY 2001 -- ADF, AOML base and NOS funds utilized to get started**

**FY 2002 -- Requested \$1.7M in failed SHC initiative for CREWS/CRTF Network**

**Requested \$1M from OAR to cover FY 2002 costs; however, now  
scheduled to get \$500K from OAR in FY 2002**

**Dependent upon continued NOS and NMFS support to stay on track**

**FY 2003 -- If we can't get OAR support from \$500K back up to \$1M level,  
we will require continued support from NOS and NMFS**

**Under this scenario, we fall short of CRTF plan to install 18 stations by 2006;  
therefore, new plan calls for less stations.**



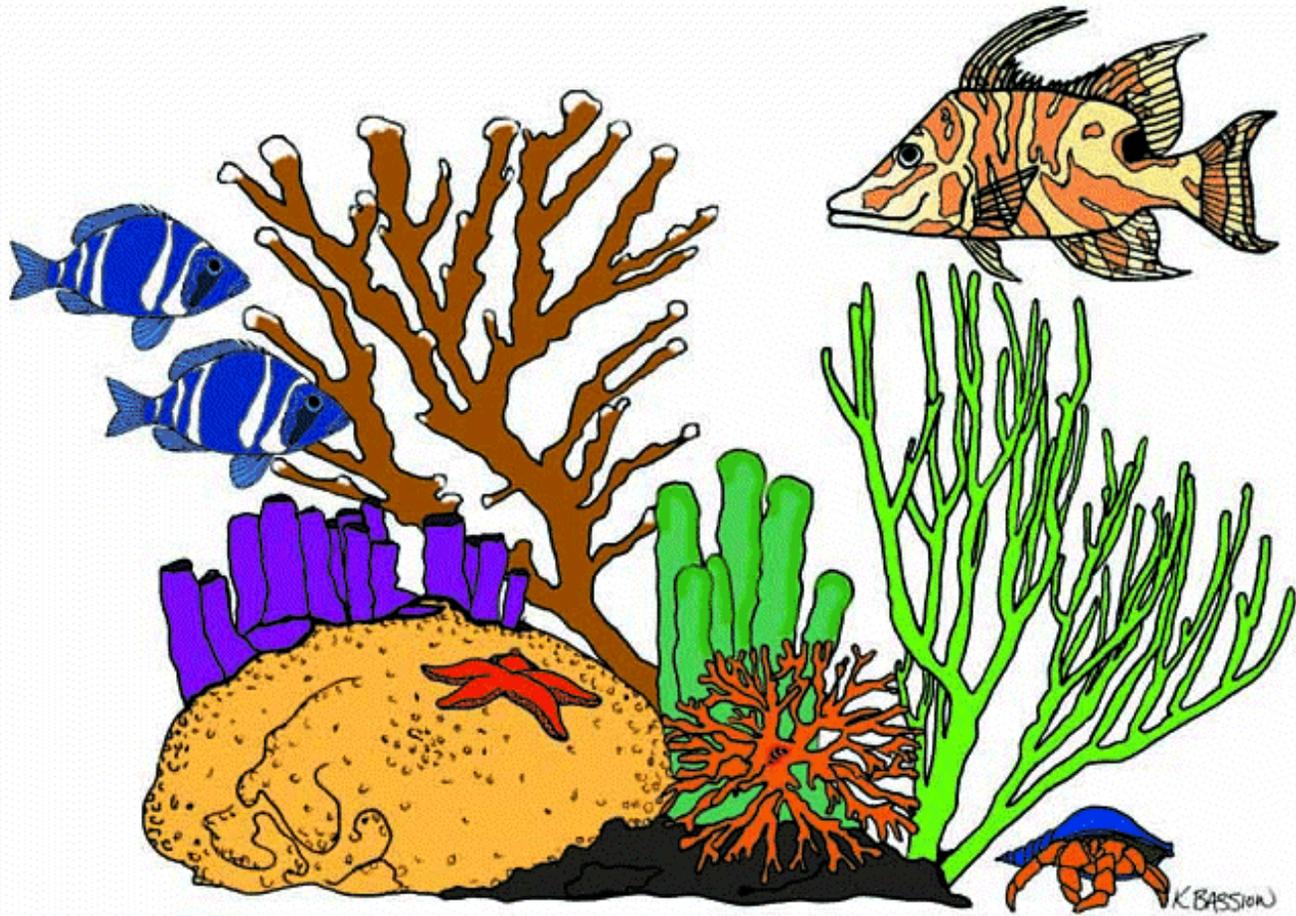
## CREWS Network Expansion Costs (assumes 15 new stations)

(Assumes 3 each year from FY02 through FY06)

Update: 10/12/2001 (Version 2)

|                                                         | Cost Extensions                                  |              |              |              |              | Totals        | FY07         |
|---------------------------------------------------------|--------------------------------------------------|--------------|--------------|--------------|--------------|---------------|--------------|
|                                                         | FY02                                             | FY03         | FY04         | FY05         | FY06         |               |              |
| <b>Computing Infrastructure</b>                         |                                                  |              |              |              |              |               |              |
| Workstation, supplies, annual licenses                  | \$8,000                                          | \$8,000      | \$8,000      | \$8,000      | \$8,000      | \$40,000      | \$8,000      |
| <b>NOAA Salaries (includes OH costs)</b>                | [ Salary and COLA increase by 5% ]               |              |              |              |              |               |              |
| J.Hendee (Project Manager)                              | \$136,500.00                                     | \$143,325.00 | \$150,491.25 | \$158,015.81 | \$165,916.60 | \$754,249     | \$174,212.43 |
| Oceanographic expertise (CREWS KE, instrumentation)     | \$147,000.00                                     | \$154,350.00 | \$162,067.50 | \$170,170.88 | \$178,679.42 | \$812,268     | \$93,806.69  |
| M. Shoemaker (Electronics Technician)                   | \$100,270.80                                     | \$105,284.34 | \$110,548.56 | \$116,075.98 | \$121,879.78 | \$554,059     | \$63,986.89  |
| J. Bishop (Electronics Technician, quarter time)        | \$25,067.70                                      | \$26,321.09  | \$27,637.14  | \$29,019.00  | \$30,469.95  | \$138,515     |              |
| C. Jeffris (Server Systems Administrator)               | \$77,666.40                                      | \$81,549.72  | \$85,627.21  | \$89,908.57  | \$94,403.99  | \$429,156     |              |
| <b>Subtotal</b>                                         | \$486,505                                        | \$510,830    | \$536,372    | \$563,190    | \$591,350    | \$2,688,247   | \$332,006    |
| <b>AOML PI Base Support (Adjustment)</b>                | (\$283,500)                                      | (\$297,675)  | (\$312,559)  | (\$328,187)  | (\$344,596)  | (\$1,566,516) | (\$332,006)  |
| <b>Total 5-Year NOAA Salary Cost</b>                    |                                                  |              |              |              |              | \$1,121,730   |              |
| <b>FY07 Salary Request</b>                              |                                                  |              |              |              |              |               | \$0          |
| <b>CIMAS/Univ Miami Salaries</b>                        | [ Salary and COLA increase by 5% ]               |              |              |              |              |               |              |
| Data QC Person (half-time)                              | \$35,700.00                                      | \$37,485.00  | \$39,359.25  | \$41,327.21  | \$43,393.57  | \$197,265     | \$45,563.25  |
| Database Administrator (half-time)                      | \$63,000.00                                      | \$66,150.00  | \$69,457.50  | \$72,930.38  | \$76,576.89  | \$348,115     | \$80,405.74  |
| Post-doc (AIMS/GBRMPA)                                  | \$51,450.00                                      | \$54,022.50  | \$56,723.63  | \$59,559.81  | \$62,537.80  | \$284,294     | \$65,664.69  |
| Student WebMaster (quarter-time)                        | \$13,650.00                                      | \$14,332.50  | \$15,049.13  | \$15,801.58  | \$16,591.66  | \$75,425      | \$17,421.24  |
| <b>Subtotal</b>                                         | \$163,800                                        | \$171,990    | \$180,590    | \$189,619    | \$199,100    | \$905,098     | \$209,055    |
| <b>Total 5-Year CIMAS Salary Cost</b>                   |                                                  |              |              |              |              | \$905,098     |              |
| <b>FY07 Salary Request</b>                              |                                                  |              |              |              |              |               | \$209,055    |
| <b>Station Instrumentation and Deployment</b>           |                                                  |              |              |              |              |               |              |
| Each Station                                            | <b>New Stations &amp; Continuing Maintenance</b> |              |              |              |              |               |              |
| Basic Met/Ocean Station Instrumentation                 | \$135,000                                        | \$135,000    | \$135,000    | \$135,000    | \$135,000    | \$675,000     |              |
| Additional Instrumentation (CO2, optical or acoustical) | \$120,000                                        | \$120,000    | \$120,000    | \$120,000    | \$120,000    | \$600,000     |              |
| Marine contractor, engineer, installation               | \$45,000                                         | \$45,000     | \$45,000     | \$45,000     | \$45,000     | \$225,000     |              |
| Data Equip/Supplies--AOML                               | \$3,000                                          | \$3,000      | \$3,000      | \$3,000      | \$3,000      | \$15,000      |              |
| Travel                                                  | \$12,000                                         | \$12,000     | \$12,000     | \$12,000     | \$12,000     | \$60,000      |              |
| <b>Subtotal</b>                                         | \$315,000                                        | \$315,000    | \$315,000    | \$315,000    | \$315,000    | \$1,575,000   |              |
| <b>Total 5-Year Station Costs</b>                       |                                                  |              |              |              |              | \$1,575,000   |              |
| <b>FY07 Request</b>                                     |                                                  |              |              |              |              |               | \$0          |
| <b>Host-Site Expenses</b>                               | <b>New Stations &amp; Continuing Maintenance</b> |              |              |              |              |               |              |
| Equipment and station maintenance                       | \$15,000                                         | \$30,000     | \$45,000     | \$60,000     | \$75,000     | \$225,000     |              |
| Contract salaries (local maintenance)                   | \$60,000                                         | \$120,000    | \$180,000    | \$240,000    | \$300,000    | \$900,000     |              |
| Data Equip/Supplies--Local                              | \$15,000                                         | \$30,000     | \$45,000     | \$60,000     | \$75,000     | \$225,000     |              |
| <b>Subtotal</b>                                         | \$90,000                                         | \$180,000    | \$270,000    | \$360,000    | \$450,000    | \$1,350,000   |              |
| <b>Total 5-Year Host-Site Expenses</b>                  |                                                  |              |              |              |              | \$1,350,000   |              |
| <b>FY07 Request</b>                                     |                                                  |              |              |              |              |               | \$0          |
| <b>Total Individual Year Costs</b>                      | \$1,063,305                                      | \$1,185,820  | \$1,309,961  | \$1,435,809  | \$1,563,450  |               |              |
| <b>Total 5-Year Project Cost</b>                        |                                                  |              |              |              |              | \$4,991,829   |              |
| <b>Total FY07 Request</b>                               |                                                  |              |              |              |              |               | \$209,055    |





# Coral Health And Monitoring Program