



Flower Garden Banks National Marine Sanctuary

Research and Science Interpretation Summary

2002

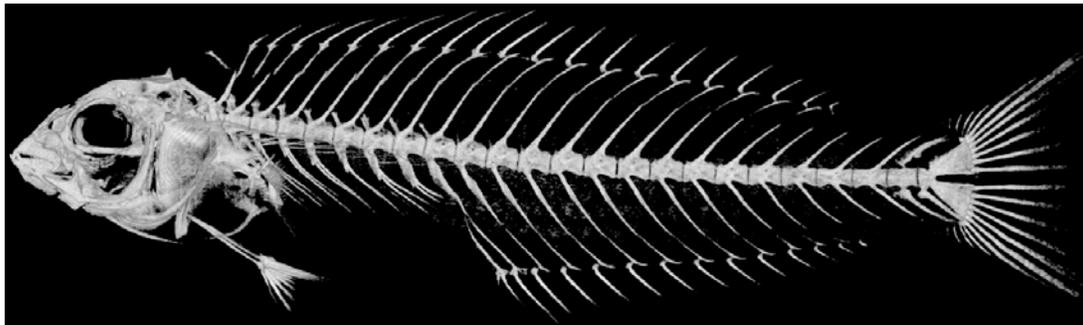


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February 2003



3D CT Scan of Mardi Gras Wrasse
Weaver/FGBNMS/UT



Mardi Gras Wrasse/Burek

Overview:

The purpose of this document is to report the activities of the Research team during 2002. The team included Emma L. Hickerson (Research Coordinator), Doug Weaver (GIS specialist), Kevin L. Buch (Research Specialist) and Heidi Lydersen-Bulman (Research Assistant).

Summary:

High resolution multibeam bathymetry surveys produced approximately 2000 km² of mapping products, covering 12 topographic features in the northwestern Gulf of Mexico. Remotely Operated Vehicle (ROV) surveys were conducted in the deeper habitat areas within Sanctuary boundaries. Sustainable Seas Expedition submersible activities were conducted on the West Florida shelf as well as the northwestern Gulf of Mexico. A pool of 45 sanctuary personnel, scientists, and volunteer divers conducted a total of 546 SCUBA dives within the Sanctuary during the 2002 field season. Activities included biological surveys, reef monitoring, equipment maintenance, and image collection. A total of 9 new research permits were processed, adding to the 7 ongoing from previous years. Science interpretation/outreach activities produced several posters and video highlights, and much time was spent coordinating images for Aquaria exhibitry. GIS capabilities within the Sanctuary have increased with the hiring of Doug Weaver (GIS specialist/deep reef fish biologist). The Sanctuary is describing a wrasse new to science, named after photographers, Joyce and Frank Burek. Common name – Mardi Gras Wrasse. As many as 30 fish and invertebrates have been added to the Sanctuary species list from observations made by Sanctuary staff, scientists and recreational divers during the 2002 field season.

Cruises:

FGBNMS-2002-DS1 – Pt. Glass Maiden Voyage – Download Datasondes at three banks, Light meter HI389A, check on TABS buoy V

FGBNMS-2002-Deep Reef Habitat Characterization #3 – M/V Spree – NURC Phantom S2 ROV contracted. Conducted 18hrs 44mins ROV surveys. 9 dives – WFGB. 5 dives – EFGB. Limited SCUBA ops for sampling – Dunton, Woodley and Weaver. PR ops – Johnson – Austin American Statesman. Undescribed wrasse species was collected by Weaver.

FGBNMS-2002-Spring Research – M/V Fling – Researchers conducted approximately 90 dives in conjunction with projects by UTMSI (Dunton), NCCOS (Woodley), TAMU (Wicksten), and USGS/UF (Weaver). Datasondes were changed out on all three banks. Two of the three datasondes had sustained damage. Buoy N was checked visually. A previously unrecorded species of decapod was collected by Wicksten.

FGBNMS-2002-SBLTM – M/V Fling – A team of 21 sanctuary personnel and volunteer research divers conducted a total of 99 dives over a period of 1 day, plus one dive. A total of 45 repetitive photostations were marked and photographed, and 3 video transects were conducted. After the cruise, the images were scanned and digitally filed, and

printouts were included in the monitoring folder for future analysis. The map used to navigate to the stations was updated for use during the 2003 data collection cruise.

FGBNMS-2002-Summer Research – M/V Fling – Conch researchers and the Burek photography team joined REEF during their annual fish counting cruise to the Sanctuary. Proposed conch research includes tagging individuals and collection of tissue samples for genetic analysis.

FGBNMS-2002-SSE – M/V Ocean Project – FGBNMS joined National Geographic and Nuytco in Tampa. Conducted submersible operations using the DeepWorker and Deep Rover at the following sites: Steamboat Lumps, Madison/Swanson Reserve, Pinnacles (Slump Slope, Alabama Alps, Scamp Reef, and Saltdome), Jakkula Bank, Alderdice Bank, Sidner Bank, Rezak Bank, McGrail Bank, and Sonnier Bank. During Leg 1, 22 dives were conducted, for a total of close to 90 hours of submersible time. Several range extensions for fish and algae resulted from the observations and video analysis.

FGBNMS-2002-Coral Spawn – M/V Spree – Annual Coral Spawning Cruise – 19 researchers and volunteers conducted a total of 231 dives over 5 days. The group documented coral, brittle star, sponge, and fish spawning. Cephalopod surveys were conducted, and several squid were collected for identification by Jenn DeBose of UC-Davis, California. Coral and brittle star spawning observations and research was led by Dr. Peter Vize of the University of Calgary, Canada. World-renowned videography team, Howard and Michele Hall, collected Hi-Definition footage of the reef and the coral spawning, as well as footage from HIA389. They were accompanied by Mark Thurlow. Several still photographers, Joyce and Frank Burek, Jesse Cancelmo, and Gary Merritt were on hand to photodocument activities.

SHELL COMMERCIAL SHOOT – Emma Hickerson accompanied 24 representatives from Spirit Films (UK), a London based advertising agency, and an underwater film crew from Florida on board both the M/V Spree and M/V Fling to advise and observe during the filming of a 60 second documentary style commercial for Shell, Inc. Jim Ray was the lead “actor” in the film. Surface conditions were less than perfect, but underwater film opportunities were more than sufficient. In less than 1.5 days of filming on the East Bank, the film crew was able to obtain the necessary footage of a loggerhead sea turtle and 2 manta rays. In addition to this, a dive was made on HIA389 gas platform, during which a loggerhead was encountered and filmed.

FGBNMS-A/I-2002 – M/V Spree and Fling - G.P. Schmahl and Doug Weaver accompanied 10 Agency and Industry representatives on the annual information transfer cruise. In addition to interacting with the participants, G.P. and Doug conducted observations of the conditions of the banks, as well as conducted surveys at Stetson Bank for the Mardi Gras Wrasse. Notable encounters were 2 whale sharks – one on a platform, and the other at Stetson Bank. The Stetson animal was observed rubbing on the down lines of the vessel. This was observed on a prior occasion by a different animal encountered at the East Bank earlier this year.

FGBNMS-LTM-2002 – M/V Fling - G.P. Schmahl and Emma Hickerson accompanied the new contractors, PBS&J, Geo-Marine, Inc., and Dauphin Island Sealab, to conduct the annual long term monitoring data collection. East Bank operations were completed after 2 days, and West Bank, after just 1 day. YSI instruments were redeployed on East, West, and Stetson Banks. Rough sea conditions cut the cruise short by a day.

Mapping/GIS Activities:

- \$200K (NOAA's Office of Ocean Exploration) and \$100K (MMS) was obtained to conduct high resolution multibeam bathymetry. The money was transferred to Dr. Jim Gardner, USGS, Menlo Park, to conduct the surveys. The C&C Technologies vessel, the *M/V Ocean Surveyor*, was contracted on short notice, and conducted the surveys, using a Kongsberg-Simrad surveying system, from June 7 – June 26. In all, twelve topographic features were mapped: Jakkula, Alderdice, Rezak, Sidner, Bouma, McGrail, Sonnier, Geyer, Bright, Rankin, MacNeil, and 29 Fathom Banks. Some of this bathymetry was groundtruthed during SSE submersible operations. For data and cruise report see <http://geopubs.wr.usgs.gov/open-file/of02-411/>
- Scanned and georeferenced historical habitat maps for East and West Flower Garden Banks. Overlaid as layer in GIS on high-resolution multibeam bathymetry
- Translated flat bathymetry to 3D, georeference images of select NW Gulf of Mexico topographic features for integration into WinFrog tracking system during Sustainable Seas Expedition.
- Gardner (USGS) bathymetry of the NW Gulf of Mexico topographic features were instrumental in conducting successful submersible dives during SSE – dives were planned based on the bathymetry – waypoints were marked to assist the pilot in finding features of interest on bottom. The actual dive tracks of the submersible dives were superimposed on the bathymetry after the dive. These charts will be used as a base layer in documents further characterizing the topographic features within and outside the Sanctuary boundaries.

Additional Science Activities

1. In preparation for 2002 Stetson Monitoring, reviewed previous year's data, maps, protocols, and updated as necessary. Scanned, filed, and printed out Stetson Bank 2002 annual monitoring images post-collection, and updated maps and notes in preparation for 2003 collection (Lydersen).
2. Research and development of monthly sampling protocols (Buch).
3. 03/22-28/02 Woodley collection cruise, Key Largo, FL (Buch)

Undescribed species

Mardi Gras Wrasse – Stetson Bank collection – April 19, 2002. First documented by photograph by Joyce Burek.

First documentation of transitional stage individuals for the species.

3D CT scanned images of skeleton obtained from the University of Texas Department of Geology. Rainbow wrasse scans also made for comparison, gonads were assessed, and tissue samples genetically analyzed. 3D Wax prints were created at three different scales (1X, 5X, 10X) depicting the features of the skull.

A manuscript describing this wrasse is ready for submission.

New Records for FGBNMS

Invertebrates

Crustaceans:

Munida pusilla – Mary Wicksten

Unidentified sea spider – *Anoplodactylus* sp. – 1988

Infraorder Caridea: shrimp

Snapping shrimp

Alpheus beani - 1978

Automate evermanni - 1976

Synalpheus fritzmuelleri - 1978

Synalpheus townsendi - 1978

Infraorder Anomura: hermit crabs and relatives

Family Galatheidae: galatheid crabs

Galathea rostrata - 1976

Infraorder Brachyura: true crabs

Family Majidae: spider crabs

Mithrax acutifrons - 1962

Family Xanthidae: pebble crabs

Pilumnus floridanus - 1978

Order Hoplocarida: mantis shrimp

Gonodactylus sp. – 1972-1973

Chitons:

Unidentified chiton, Class Polyplacophora – 1988

The above records were specimens taken by submersible or grab surveys historically. They had not been reported in any previous literature. Dr. Mary Wicksten (TAMU) has undertaken the task of sorting through undocumented samples.

Gastropods:

Ornate Elysia – *Elysia ornata*– Joyce Burek

Cephalopods:

Southern shortfin squid – *Ilex coindetti*

Loligo roperi

Loligo pealii

All cephalopod observations were reported by Jennifer De Bose – UC-Davis/FGBNMS

Echinoderms:

Red starfish - *Sclerasterias contorta*

Long-spined cidaroid “pencil urchin” – *Calocidaris micans*

Large urchin with curved spines and red-pink test – *Coelopleurus floridanus*

Large, long-spined, dark urchin – *Centrostephanus longispinus rubricingulus*

The echinoderm observations were filmed during deepwater characterization ROV surveys in April. Identifications were later obtained from Drs. Christopher Pomory (University of Florida, Talahassee) and Mary Wicksten (TAMU).

Fish

Deep water Habitat Characterization and Assessment ROV Cruise #3:

Three-eye flounder – *Ancylosetta dilecta*

Southern Hake – *Urophycis floridana*

Yellowedge grouper - *Epinephelus flavolimbatus*

broad flounder – *Paralichthys squamilentus*

dusky flounder – *Syacium papillosum*

red cornetfish- *Fistularia petimba*

hunchback scorpionfish- *Scorpaena dispar*

Other:

Frogfish – *Antennarius multiocellatus* – EFGB, buoy #6 – reported by Will Mitchell, 7/6/02

Lantern Bass – *Serranus baldwini* – FGBNMS/REEF cruise, 8/1/02

Unidentified species of pipefish – FGBNMS/REEF cruise, 8/1/02

Lancer Dragonet – *Paradiplogrammus bairdi*– Stetson Bank, Joyce and Frank Burek, Gary Merritt

Green moray – *Gymnothorax funebris*

Science products

- Essential Fish Habitat cruise notebook – Cruises I and II (conducted 2001)
- Essential Fish Habitat cruise notebook – Cruises III
- Annual research summary 2001

Research and Science Partnerships

- Azure Photographic Services
- Belize Whale Shark Research
- Minerals Management Service (MMS)
- National Undersea Research Center (NURC)
- Office of Ocean Exploration (NOAA)
- National Geographic Society (NGS) – Sustainable Seas Expedition – Dr. Sylvia Earle
- North Carolina Coastal Ocean Service (NCCOS - Cheryl Woodley, Jon Hare)
- Reef Environmental Education Foundation (REEF)
- Texas A&M University – Corpus Christi
- Texas A&M University (TAMU – Biology Department - Mary Wicksten, Department of Oceanography – Toby Jones and Brett Phanauf)
- Texas A&M University (TAMU) – Geochemical and Environmental Research Group (GERG)
- Texas Parks and Wildlife (TPWD)
- United States Geological Service (USGS – Jim Gardner)
- University of Texas

Conferences, Meetings, Training, etc.

1. MMS – Information Transfer Meeting, New Orleans, LA – January 8-10 – attendee – Hickerson
2. Research Coordinators Meetings, Charleston, South Carolina, - January 29 – February 1 – attendee – Hickerson
3. NMFS ROV Training/Site visit – Pascagoula, MS – Hickerson – February 10, 2002
4. Sustainable Gulf of Mexico Symposium, Texas A&M University, College Station, Texas – Hickerson, Buch – February 19-21, 2002
5. Ocean Exploration Workshop, Oxford, MS – Hickerson – February 28 – March 1, 2002
6. Underwater Intervention Conference, New Orleans, LA – Hickerson – March 2, 2002
7. DeepWorker Training, College Station, TX – Hickerson, Schmahl, Weaver – June 22 – July 5, 2002
8. MMS TPEC Meeting, New Orleans, LA – Hickerson – July 9-12, 2002
9. Audubon Aquarium of the Americas – Opening of the FGBNMS exhibit, New Orleans, LA – Hickerson, Weaver, Schmahl, Lydersen – August 8, 2002
10. SSE/Harte Research Center Open House, Corpus Christi, TX – Hickerson, Schmahl, Weaver – August 24, 2002

11. NOAA's Gulf of Mexico GIS Pilot Project, Tampa, Florida – Weaver – September 17-18, 2002
12. Bathymetry Meeting, New Hampshire – Weaver -November 19, 2002
13. DeepWater Applied Research Consortium, College Station, TX – Hickerson – December 16, 2002

Science Interpretation/Outreach Activities

1. Maintenance of slide library
2. Maintenance of digital slide catalog/library
3. Maintenance of Power Point presentation catalog
4. Maintenance of video library (annotations)
5. Video provided to various requesting parties: Aquarium of the Americas
6. Production of photographic images for Sanctuary tabletop display
7. Development of PowerPoint presentations for various events
8. Development and production of Anniversary Poster Series (6 posters)
9. Development of Highlights 2001 video
10. Participation in Ocean Discovery Day – March 16, 2002 - Buch
11. Participation in Coast Guard Fly-Overs of FGBNMS (2)
12. Development of SSE 2002 Highlights video (with Kip Evans)
13. Coordinated Anniversary/Agency/Industry cruise – October 20-23, 2002
14. Development of FGBNMS Highlights 2000-2002.
15. Worked closely with NMSFoundation/Laurie Howell for images for National Aquarium Exhibit.
16. Produced multimedia and award products for Sanctuary 10th Anniversary Gala – October 20, 2002.
17. Attended and/or presented in Sanctuary Lecture series (2).

Management Activities

- Writing of permits for science activities
- Attended Sanctuary retreats
- Responded to DUOY teacher death in Manager's absence.
- Documented and reported break in shunt pipe at HIA389
- Responded to oil and gas industry spill drills in Manager's absence.

Personnel

- Hired on GIS specialist/Fish biologist – Doug Weaver – RSIS contract – 30 hrs/wk
- Hired on TAMU undergraduate as research intern – general contract – 10 hrs/wk
- Kevin Buch left Sanctuary employment for position in Bahamas
- Benefited tremendously from volunteer research assistant for Summer period – Heidi Lydersen-Bulman – 40 hrs/wk

Technology

1. Maintenance and development of media equipment
2. Building of Sanctuary capabilities of photographic equipment.
3. Research for underwater technologies to further Sanctuary's capabilities.