SKYLAB OCEANIC GAMEFISH PROJECT

FIELD OPERATIONS REPORT

JULY 2 - AUGUST 10, 1973

September 28, 1973

NATIONAL MARINE FISHERIES SERVICE
SOUTHEAST FISHERIES CENTER
FISHERIES ENGINEERING LABORATORY

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SECTION 1

INTRODUCTION

The Skylab Oceanic Gamefish Project Field Operations Report concludes the mission field operations as defined in the Statement of Work, NASA Headquarters Proposal Registration No. 240, entitled "Application of Remote Sensing for Fishery Resource Assessment and Monitoring". The project, including the operations narrated herein, was contracted to the National Marine Fisheries Service's Fisheries Engineering Laboratory by the National Aeronautics and Space Administration's Lyndon B. Johnson Space Center, Houston, Texas, by Contract Order No. T-8217B.

NASA's Johnson Space Centers' Earth Resources Laboratory (ERL) located at MTF had all responsibility in the planning, acquisition, processing and analysis of surface and remote oceanographic data required to meet the experiment objectives. The laboratory's role in the project is defined in the document "Description of Participation of the Earth Resources Laboratory at the Mississippi Test Facility", dated May 24, 1973.

The field operations provided a data base upon which to test the relationship between game fish and their environment. It also provided a means to ascertain which environmental characteristics of the ocean could be observed from remote sensing aircraft and satellite platforms. This NOAA-NASA operation was a demonstration of many diverse groups working cooperatively toward a common scientific goal. Figure 1 shows the overview of the operations.

NASA directed the activities of the Skylab astronauts during Skylab Track 62 overpass across the northeastern Gulf of Mexico. NASA's Johnson Space Center ERL directed the two Earth Resources aircraft -- a NC-130 and a Beechcraft (E18) which employed an array of cameras and other sensors much like those carried by Skylab to monitor the site from the relatively low altitudes of 20,000 and 10,000 feet. The Earth Resources Laboratory also directed activities of nine oceanographic research vessels, using their vessel ERL as the "hub boat", three NOAA research vessels - OREGON II, GEORGE M. BOWERS KINGFISH II, and five charter vessels. They also maintained radio contact with all members of the fishing and research fleet. The NASA Marshall Space Flight Center at the Mississippi Test Facility provided extensive laboratory, some field-site, and public relations support. The NASA units involved operated from the Mississippi Test Facility, Bay Saint Louis, where the field operations were staged.

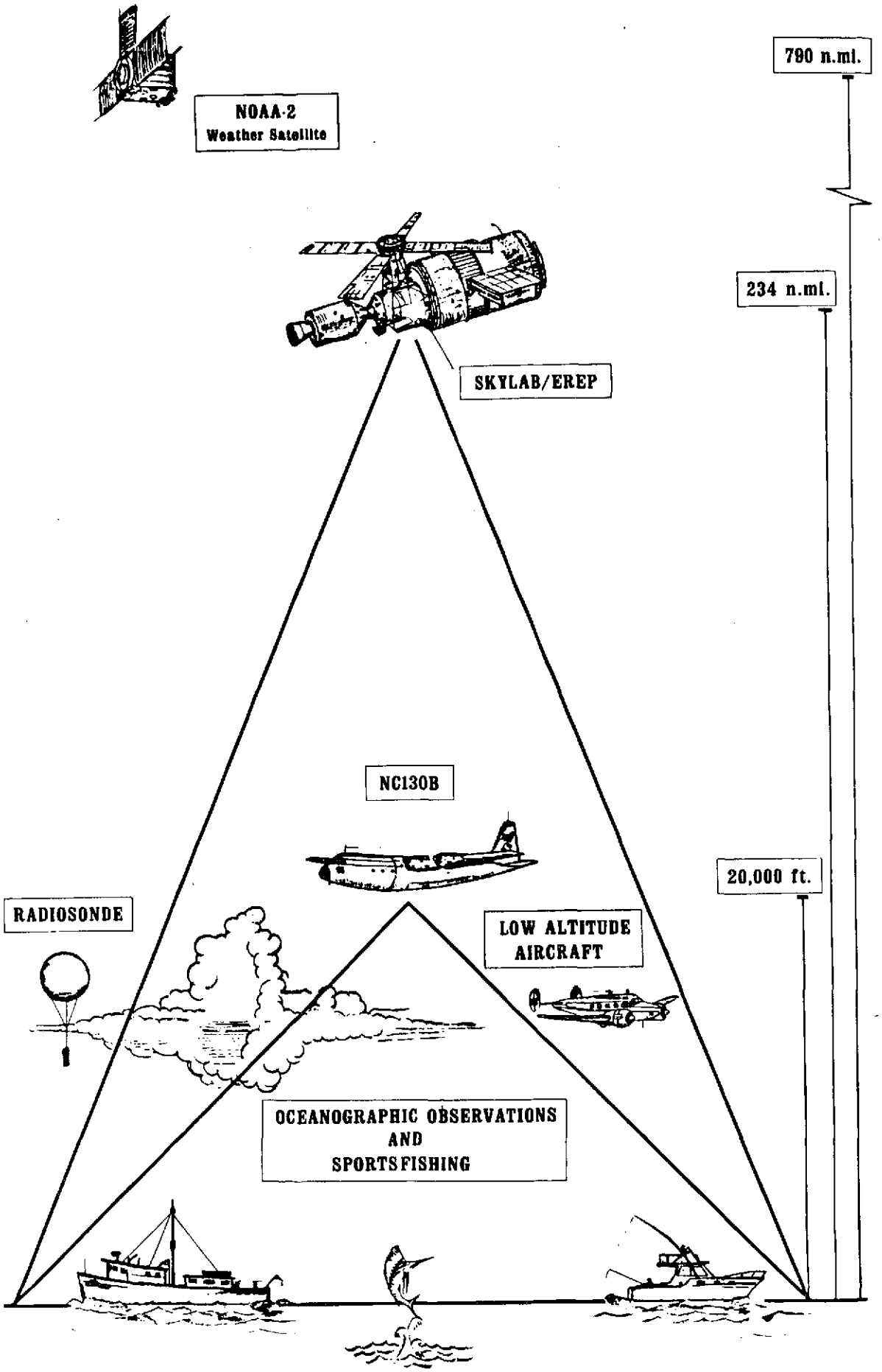


Figure 1. Operational Overview

Six fishing clubs and charterboat associations headquartered in Alabama, Florida, and Louisiana, coordinated the volunteer fishing program to acquire biological and fishing data. This data was acquired thru a Skylab Gamefish Tournament held August 4-5 under the general management of the Pensacola Big Game Fishing Club. Fishing tournament officials restricted competition for trophies to seven offshore gamefish species: blue marlin, white marlin, sailfish, wahoo, dolphin, bluefin tuna, and yellowfin tuna. Minimum weights were set for wahoo, dolphin, and the tunas. To be eligible for prizes, catches had to be taken in the daytime between 9 and 3 o'clock, and weighed and measured at one of the three official port stations at Destin, Panama City, and Pensacola.

Approximately 325 anglers turned out for sport and science aboard 138 registered boats for the two-day tournament. The bluewater fishermen operated from 20- to 57-foot crafts scattered over a 5,400 square-mile triangle. The test site was designed to match the orbiting pattern of Skylab. The anglers kept records of all fish sighted, raised, lost, hooked and boated. The NOAA R/V OREGON II operated as a mothership for the tournament as well as acquiring oceanographic data.

In addition to the NASA participation, a U.S. Navy plane (NP3A) flew over the area at 1200 feet acquiring oceanographic data. The U.S. Air Force satellite DAPS provided sea surface imagery prior to, during, and after the field operation.

NOAA's National Weather Survey and the National Environmental Satellite Service provided weather data for the field operations.

The NMFS Principal Investigator, Mr. W. H. Stevenson, coordinated the overall experiment with co-investigators from the field operations trailer at Destin, Florida. Staff members of the NMFS Southeast Fisheries Center and Washington Office provided professional support for the entire operations.

Details of the operations can be found in "Oceanic Gamefish/Skylab Project Field Operating Plan for Operations 4, 5 August", dated 27 July 1973 and "Project Plan, Oceanic Gamefish/Skylab Project, Experiment #240", dated May 18, 1973. Both documents are available from NMFS, Southeast Fisheries Center, Fisheries Engineering Laboratory, MTF, Bay St. Louis, Mississippi 39520.

SECTION 2

OBJECTIVES

The overall objective of the project is to establish the feasibility of utilizing satellite imagery for determining the availability and distribution of living marine resources. This objective will be achieved through a series of correlations between satellite/aircraft imagery and sea truth information related to the marine environment and the oceanic game fish resources.

Other objectives of the overall experiment are as follows:

- Test use of satellite remote sensing data to improve oceanic game fish stock assessment.
- Enhance capability to predict best area for oceanic game fish.
- Examine relationships between ocean surface data and game fish distribution.

In order to comply with the project objectives stated above, specific field operation objectives were established as follows:

- Acquire meteorological, oceanographic and fisheries data simultaneously in the study area through effective coordination of space, air and surface operations.
- Deploy Government and Government-chartered vessel with observers and equipment for sea truth data acquisition at selected stations or pre-arranged tracks.
- Promote active, volunteer participation by sports fishermen and support their tournament activities in order to enhance gamefish data acquisition over the two-day period.
- Organize and operate a field operations control center with chart displays for quick-look evaluation and radio and telephone communications for receipt of operational information and implementation of decisions.
- Staff and operate information centers at Pensacola, Destin and Panama City to interface with local sports fishermen, coordinate port sampling and support game fish samplers embarked on sportsfishing boats.

- Support public relations activities in order to encourage participation of the fishing public and satisfy the general public interest in the experiment.

SECTION 3

PARTICIPATION

Each role in the Skylab Oceanic Gamefish Project was important. As in any large operation over an extended area, it is difficult to focus on individual efforts. A chart depicting participating agencies and organizations is shown in Figure 2. Specific assignments of individuals are shown in Table 1.

The U. S. Air Force provided DAPS satellite data received at Keesler AFB, Mississippi. A U. S. Navy representative from the Environmental Prediction Research Facility, Monterey, California, assisted NMFS/FEL in the analysis of the DAPS data.

Weather data was received through NESS from the NOAA-2 satellite. The weather station at Eglin AFB launched a special radiosonde to coincide with Skylab overflight in order to provide meteorological data from atmospheric correction of values to be derived from satellite and aircraft sea surface temperature sensors. Standard radiosonde data from Valparaiso, Florida, Pensacola, Florida, and Mobile, Alabama are available to supplement the Eglin weather information.

The Skylab Earth Resources Experiment Package (EREP) overpass occurred at approximately 1140 local time on August 5 with excellent visibility and ceiling unlimited except for 10 to 40 percent scattered cumulus cloud cover below 10,000 feet. Concurrently, three aircraft flew data-gathering missions in the area. A NASA earth survey aircraft, the NC130B, based in Houston, Texas, flew three flight lines totalling 226 n. mi. through the area at 20,000 feet altitude. A Navy NP3A deployed expendable aerial bathythermographs from 1200 feet altitude according to a prearranged pattern. A NASA E-18 flew transects totalling 226 n. mi. at 10,000 feet altitude. An E-18 mission on August 4 was cancelled because of overcast with a base at less than 10,000 feet.

Four Government and five Government-chartered vessels operating out of Orange Beach, Alabama, Destin, Florida, and Panama City, Florida gathered sea truth data during daylight hours on August 4 and 5. Data task teams with standard boat kits were embarked on each surface craft. Several boat malfunctions occurred with repairs being effected in one instance and the disabled boat being replaced in the other.

Sports fishermen provided game fish data resulting from participation in a tournament coordinated through the Pensacola Big Game Fishing Club by a committe of prominent anglers representing four big game fishing clubs and two charter boat associations.

NOAA	NASA	OTHER
National Marine Fisheries Service	Johnson Space Center	U. S. Air Force
National Environmental Satellite Service	Earth Resources Laboratory	U. S. Navy - EREP WRCON/JAX
National Weather Service	Goddard Space Flight Center	U. S. Coast Guard
National Ocean Survey		

SPORTSFISHING

Panama City Charterboat Association

Destin Charterboat Association

Pensacola Big Game Fishing Club

Mobile Big Game Fishing Club

New Orleans Big Game Fishing Club

Golden Meadow Big Game Fishing Club

Figure 2. Participating Agencies

Table 1. Skylab Gamefish Personnel Assignments

FUNCTION	PENSACOLA	DESTIN	PANAMA CITY
Information Coordinating Centers (Trailers)	W. J. Bettens	R. Farragut	J. Brucks
Port Samplers	R. Parrish B. Cook	P. Thompson J. Ogle J. Lockfaw	T. Fontaine
Gamefish Samplers	T. Flynn J. Benigno R. Minkler	A. Magill C. Roithmayr B. Fuller T. LaMunyon B. Fett	F. Wittmann J. Anderson
Public Relations	M. Herring	A. Weeks T. Malone	
Management and Data Support	P. C. Cook	Mgt. A: W. Stevenson, L. Tilton, L. Rivas, S. Ellis Mgt. B: G. Woods, J. Weldon, K. Savastano, A. Westendorf	E. Pastula
NASA/ERL Communication/Boat Crew	R. Cartmill B. Edwards A. Peresich T. Lemon H. Polk D. Powell B. Skipper D. Jarrel K. Breisacher M. McIntosh	H. Adams G. Zetka T. Worthington V. Lambert	B. Atwell P. Vegas W. Jones J. Brashier H. Owens
E-18 Aircraft Operators W. Colliver C. Morgan	Embarked on OREGON II W. Gandy F. Wittmann B. McLemore P. McKim C. Campbell A. Koym P. Cummings	Embarked on J. C. BOWERS R. Cummings S. Drummond J. Barrett H. Hudson D. Sutherland L. Keister	

Entries registered for the tournament totalled 138 charter and private sportsfishing boats from marinas along the Gulf Coast from New Orleans, Louisiana to Panama City, Florida. Actual participation was somewhat less with eighty-two boats participating on August 4 and sixty-nine on August 5. A total of 325 anglers (including boat captains) were embarked during the two-day tournament.

Government and contractor personnel were embarked on each of twelve game fishing boats for the two tournament days and collected environmental data as nearly concurrent with game fish catches as was feasible.

Field operations control was exercised from a Field Center located near East Pass at Destin, Florida and staffed with personnel from the Mississippi Test Facility, NMFS Panama City and the NMFS Miami Center. Information centers were also manned at Panama City, Florida and Pensacola, Florida.

SECTION 4

SCHEDULE

During the last week in June it became apparent that due to changes in the Skylab launch schedule, the favorable opportunity for EREP photography/imagery over the test site would occur on 5 August. On that date the satellite would overpass the test site on track 62 close to noon with the sun's rays striking the ocean surface at a high angle of incidence minimizing surface glint. On succeeding five day cycles of Skylab overpass, conditions would become progressively less favorable.

Accordingly, field operations were advanced from 15 September (based on the previous Skylab schedule) to 4, 5 August. Figure 3 shows the schedule for field operations on 4, 5 August including the planning milestones and activities during July and leading up to the field operations.

MILESTONE	JULY 1973	AUGUST 1973
Tournament Committee Formed	4 ▽	
Survey Trip to Pensacola, Destin, Panama City	10 11 □	
Pensacola Big Game Fishing Club Prepared Tournament Entry Packages	11 14 ▭	
Four Contingency Plans (A, B, C, and D) Prepared for Sea Truth Operations and Aircraft Operations	16 19 ▭	
Field Operations Plan Developed	16 27 ▭	
Trailers Emplaced	19 ▽	
Contracts Issued	19 ▽	
Information Centers Activated	20 ▽	
Management Team on Station at Destin, Pensacola, Panama City		3 ▽
R/V's OREGON II and GEORGE M. BOWERS Enroute to Area		3 4 □
SEA TRUTH OPERATIONS		4 5 □
TOURNAMENT		4 5 □
SKYLAB AND AIRCRAFT OVERPASS		5 ▽
Information Centers Deactivated		6 ▽
Trailer Removal		7 11 ▭

Figure 3. Schedule for Field Operations

SECTION 5

TEST AREA

The test area (Figure 4) comprised 5400 sq. n. mi. and was shaped roughly like a triangle, bounded by the coordinates $30^{o}16'N, 86^{o}51'W$; $29^{o}18'N$, $85^{o}47'W$; and $29^{o}21'N$, $87^{o}56'W$ on the north, east and west, respectively. The northern apex lay eight miles south of Santa Rosa Island and the southern serrated edge extended 85 miles south of the apex. The adjacent sides from the apex approximated the thirty fathom curve along the coast. The northern extremity of the De Soto Canyon lay within the southern portion of the area providing depths in excess of 900 fathoms. In order to provide a grid for referencing gamefish catches, the fishing area was divided into 54 squares with 10 miles to a side.

Skylab track 62 approximately bisected the area, extending from Mobile Bay in the northwest and transiting the Gulf to the southeast.

Nine surface transects through the area were used by sea truth vessels. The transects were numbered according to the using boat and radiated outward from a hub (station 41) located at about the center of the area. Sampling stations separated by about an hour and a half cruising distance were designated along each transect. Three flight lines identified by number were flown by NASA aircraft through the area on photography/imagery missions. Figure 5 shows the boat and aircraft tracks and the sampling stations. It also shows the drop locations for the aerial bathythermographs deployed by the Navy NP3A aircraft. Sea truth station coordinates and boat assignments are tabulated in Table 2.

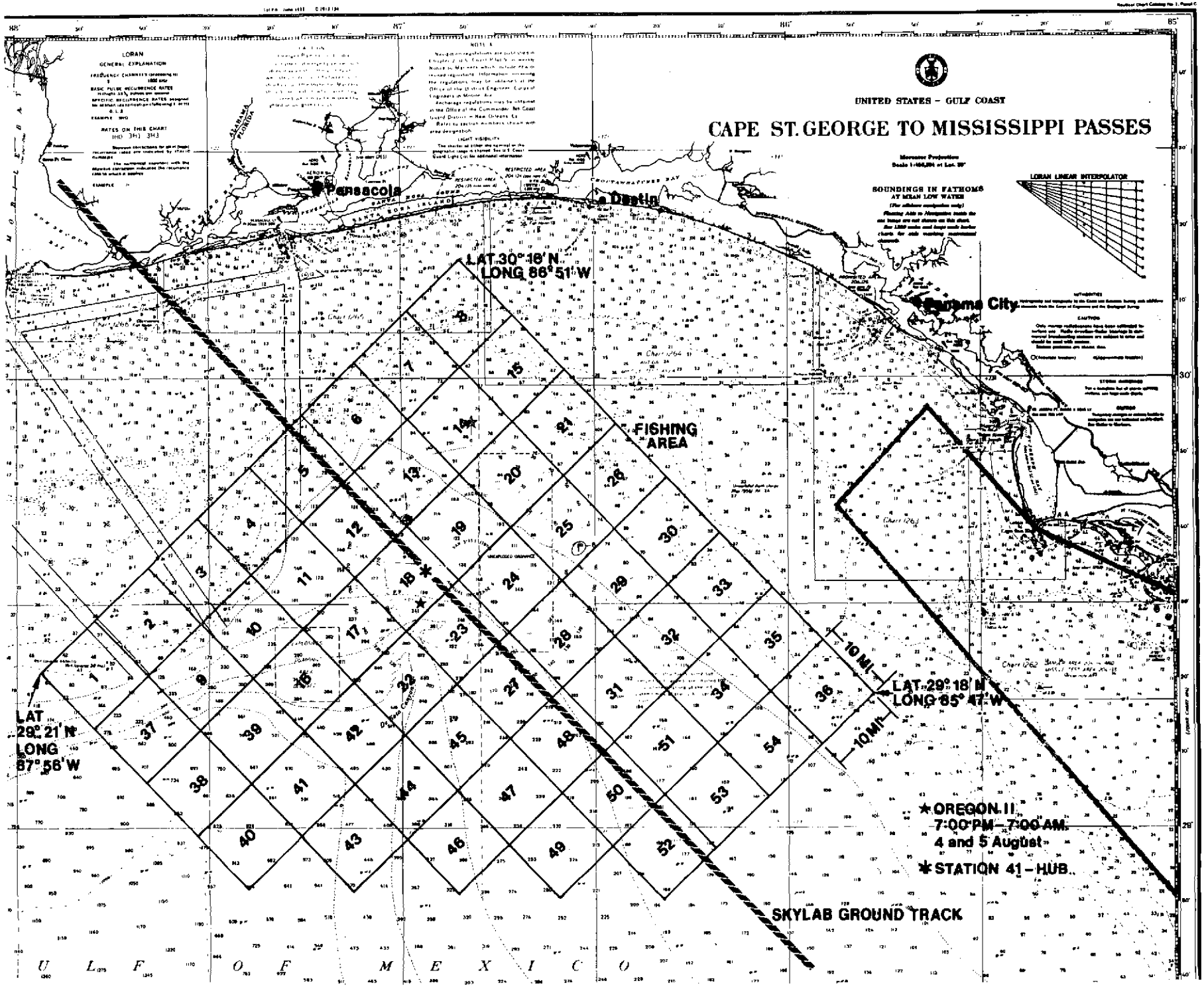


Figure 4. Test Area

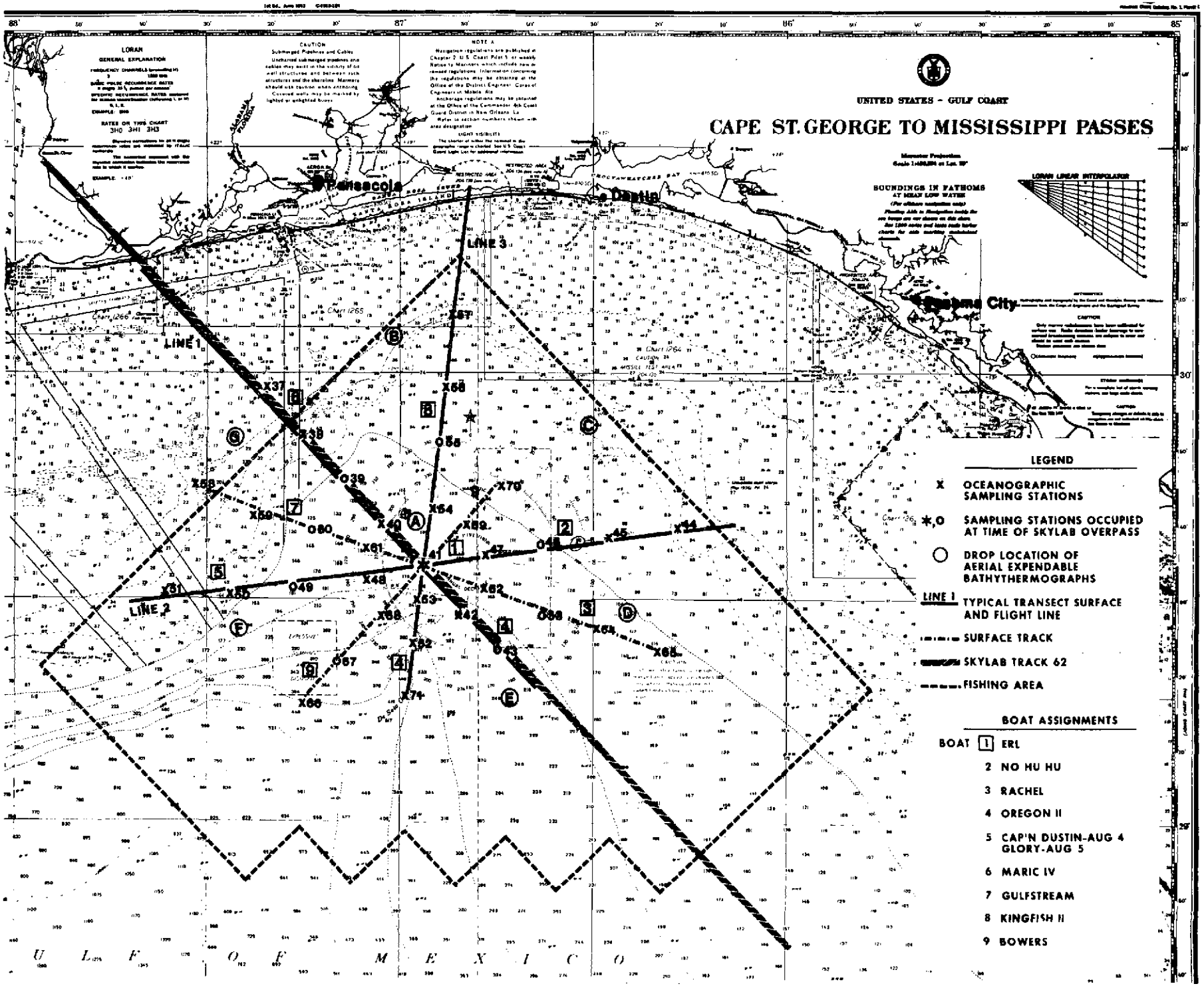


Figure 5. Transects And Sampling Stations

Table 2. Sea Truth Station Coordinates

STATION NUMBER	BOAT		LATITUDE	LONGITUDE
37	# 6	MARIC IV	29°58.0'N	87°21.5'W
38	6		29°52.0'N	87°15.5'W
39	6		29°46.2'N	87°09.5'W
40	6		29°40.3'N	87°03.2'W
41	# 1	ERL	29°34.5'N	86°56.75'W
42	# 4	OREGON II	29°28.6'N	86°51.0'W
43	4		29°23.5'N	86°45.5'W
52	4		29°24.0'N	86°58.25'W
53	4		29°30.0'N	86°57.5'W
71	4		29°17.5'N	86°59.0'W
57	# 3	RACHEL	30°07.0'N	86°52.5'W
56	3		29°58.75'N	86°53.75'W
55	3		25°51.0'N	86°54.75'W
54	3		29°42.5'N	86°55.75'W
44	# 2	NO HU HU	29°39.5'N	86°17.0'W
45	2		29°38.25'N	86°27.4'W
46	2		29°37.0'N	86°37.0'W
47	2		29°35.5'N	86°47.0'W
51	# 5	CAP'N DESTIN	29°29.0'N	87°36.5'W
50	5		29°30.5'N	87°26.5'W
49	5	AND GLORY	29°31.7'N	87°16.5'W
48	5		29°32.75'N	87°06.5'W
58	# 7	GULFSTREAM	29°45.0'N	87°32.5'W
59	7		29°42.5'N	87°23.5'W
60	7		29°39.8'N	87°14.5'W
61	7		29°37.0'N	87°05.5'W
65	# 8	KINGFISH II	29°23.0'N	86°20.5'W
64	8		29°26.0'N	86°29.3'W
63	8		29°28.7'N	86°38.5'W
62	8		29°31.5'N	86°47.5'W
70	# 9	GEORGE M.	29°45.9'N	86°44.5'W
69	9	BOWERS	29°40.2'N	86°50.7'W
68	9		29°28.3'N	87°03.5'W
67	9		29°22.3'N	87°10.0'W
66	9		29°16.5'N	87°16.5'W

SECTION 6

PREOPERATIONAL ACTIVITIES

In evolving strategy for the conduct of a 4, 5 August mission, it quickly became clear that a major unknown was the acquisition of fish catch information. Insufficient funding precluded chartering an adequate number of sportsfishing boats for catch data acquisition and the extent to which sportsfishermen could be persuaded to participate in the exercise and volunteer catch data was largely indeterminate. Complicating the matter further was the fact that contacts with sportsfishermen prior to July had led them to expect a 15 September mission, rather than a 4, 5 August mission.

Daily status meetings were scheduled with NMFS and NASA at MTF to coordinate the accelerated schedule.

An opportunity to make a new approach occurred on the evening of 4 July, when prominent Gulf Coast anglers gathered at a Pensacola, Florida marina to kick off a local tournament occurring in the next few days. Among those present were W. H. Stevenson, Project Principal Investigator and L. Rivas and G. Woods, Co-Investigators, who attended with the express purpose of generating support among sportsfishermen for the Skylab Oceanic Gamefish Project and, specifically, sparking enthusiasm for the 4, 5 August mission. A brief presentation was made by W. H. Stevenson in which he gave a synoptic perspective of the overall project, stressing the vital assistance that sportsfishermen could render by participating in the exercise and volunteering catch data.

During the course of the evening, the context of participation by sportsfishermen was established as follows:

- A tournament administered by the Pensacola Big Game Fishing Club would be conducted on 4, 5 August with registration open to all anglers with no entry fee. Added inducements suggested by the tournament committee would be a banquet for tournament participants and awards to winning anglers and boats.
- A tournament committee to provide policy guidance was named with the following representation:

Gin Arnold III	Mobile Big Game Fishing Club
Bill Bacon	Destin Charter Boat Association
Maumus Claverie, Jr.	New Orleans and Golden Meadow Big Game Fishing Club

Floyd T. Neth	Pensacola Big Game Fishing Club
B. J. Putnam	Panama City Charter Boat Association
Luis R. Rivas	National Marine Fisheries Service (Scientific Advisor)

- The NMFS Fisheries Engineering Laboratory at the Mississippi Test Facility (MTF) would contract to the Pensacola Big Game Fishing Club for tournament fishing data.
- Woven into the tournament rules would be provision for check-in by all tournament participants in order that fish catch data be provided for the project. Checkpoints or weigh-in stations would be established one each at Pensacola, Destin and Panama City locations.
- Office trailers would be set up and staffed by NMFS at the checkpoints by 20 July to act as Information Centers for local anglers seeking to participate in the tournament.

A followup trip was made by NMFS representatives on 10, 11 July to Pensacola, Destin and Panama City to settle on such issues as the tournament invitational package; contract arrangements between NMFS and the Pensacola Big Game Fishing Club; the extent of the tournament fishing area; the tournament rules; trophy numbers and type; mailing lists; trailer selection; and Information Center location at Destin.

An agreement was reached with Dr. F. T. Neth of the Pensacola Big Game Fishing Club on the contents of the tournament invitational package to be mailed to sportsfishermen. Dr. Neth explained the tournament rules which were essentially to be those used by the Pensacola Club modified to incorporate the data requirements of the project. He also provided mailing lists and made suggestions relative to the fishing area, trophies and recognition banquet which met general concurrence. Subsequently, the invitational packages were prepared and mailed out on 14 July to 482 anglers. Distribution of additional packages continued for the next three weeks through the first day of the tournament when several last minute registrations were accepted at the Information Centers. Each invitational tournament package contained a brochure with tournament rules, supplementary tournament information and a discussion of what the Skylab Oceanic Gamefish Project was all about; a reproduction of National Ocean Survey Chart 1115 with the fishing area indicated; two Gamefish Boat Log forms, approved by the Federal Office of Management and Budget; and a stamped postal card, preprinted and addressed to the Pensacola Big Game Fishing Club, whereby the angler could indicate if he proposed to participate in the tournament.

During the 10, 11 July trip, motel reservations were made at Pensacola, Destin and Panama City for Government and contractor personnel deploying to the Gulf Coast for field operations. Also, trailer rental agencies at all three cities were visited. Eventually, a Panama City firm was discovered who agreed to provide acceptable office type trailers at the three checkpoints. The technical support contractor at MTF finalized trailer arrangements contractually, providing for emplacement by 19 July with power and telephone service connection occurring shortly thereafter. Figure 6 shows the Information Center in Panama City at Captain Anderson's Marina.

A comprehensive public relations program oriented toward the local fishermen was mounted the first week in July and continued through the tournament. M. Herring, NASA MTF, and Ann Weeks, NOAA PIO, coordinated activities with direct, daily access to the Principal Investigator. A national press release was made, receiving wide spread coverage and stimulating public interest in space applications to the oceanographic/fisheries world. A number of feature articles appeared in Gulf Coast newspapers during the July buildup. Local TV stations afforded spot news coverage which served to keep local anglers up to date. Arrangements were made to provide internal photographic coverage during the field operations and press kits were made up for limited distribution. Attempts were made by NASA PIO to have an astronaut participate in the tournament, however, this could not be worked out due to previous scheduled commitments.

A critical element of the public relations program requiring early action because of long lead time was the procurement of patches and decals symbolizing the Skylab Oceanic Gamefish tournament. These patches and decals were to be handouts but would be restricted to participating boat owners, boat captains, and anglers. The Principal Investigator was advised that timely availability of these items was essential since, historically, they have constituted a provocative feature of gamefish tournaments. A logo design was quickly finalized and approved by the Tournament Committee and a circumscribed procurement negotiated with suppliers. The patches and decals were available on 1 August at the Information Centers for distribution to tournament participants. Figure 7 shows the sportsfishing boat Mako with boat decal at the Pensacola checkpoint.

The oceanic waters off the Florida panhandle from the 30 fathom curve south to the deep waters of the De Soto Canyon are normally productive for gamefishing starting in the early summer. However, advisories from local sportsfishermen indicated an unusual lack of success this year during June and extending into July even though boats were venturing farther offshore than normally. The water color was described by the anglers are "green", "dirty green" and "blue-green" but seldom as "blue". Poor gamefishing is associated

Figure 6. Information Center at Panama City

Figure 7. Sportfishing Boat with Skylab Decal

in angler opinion with the former conditions and good gamefishing with the latter condition. Accordingly, the tendency of boat captains was to cruise farther offshore until "blue" water was found and presumably there would be good gamefishing. For the 4, 5 August operations, Plans A and B were developed to cover either condition. If the demarkation between "green" and "blue" water lay inshore, then Plan A would be invoked which concentrated E-18 aircraft and surface sea truth transects in the probable area of good fishing. Plan B extended transects to cover good fishing farther out in the Gulf. It was planned to decide on Plan A or B on the evening before the tournament. Selection would depend on the location of gamefish catches during the prior several days and, also, quick look analysis of oceanographic data taken by the OREGON II and GEORGE M. BOWERS and radioed by them to the Control Center at Destin during the afternoon of 3 August.

NMFS in cooperation with the U. S. Navy Environmental Prediction Research Facility Monterey, California, reviewed the U. S. Air Force DAPS satellite data received at Keesler AFB. In addition to the NOAA-2 weather picture, DAPS provided weather and some sea surface imagery for analysis. This data supported the decision to go with Plan A. Figure 8 shows quick look evaluation of DAPS imagery.

Plans C and D provided for air and surface transects to be run on 6-10 August. They were supplementary to A and B respectively and were to be activated by management decision only in the event the Skylab EREP data pass was rescheduled to 10 August from 5 August.

The NOAA research vessels OREGON II (Figure 9) and the GEORGE M. BOWERS (Figure 10) had been scheduled to conduct shadowgraph operations in the northern Gulf of Mexico during the latter part of July and early August under the direction of the NMFS Fisheries Engineering Laboratory. However, these plans were changed to divert both vessels on the weekend 4, 5 August to the Skylab Oceanic Gamefish test site to serve as sea truth acquisition platforms. In addition, the OREGON II was designated as the tournament committee boat and would relay radio traffic on tournament business. Since it was understood that some sportfishing boats would remain at sea in the area overnight, it was also planned to have the OREGON II occupy a central location in the area and accept fish catches that the boats might transfer for cold storage. The fish would be returned the next day at sea or the OREGON II would deliver them to Panama City for transfer to the checkpoint.

During the preparation of the field activities, a set of Chatillion Beam Scales (1100 lbs.) were ordered, calibrated and installed at Destin. This action provides a set of like scales at all three checkpoints. All three scales were then calibrated in place prior to the tournament to prevent any discrepancies. Results of the calibration is shown in Figure 11.

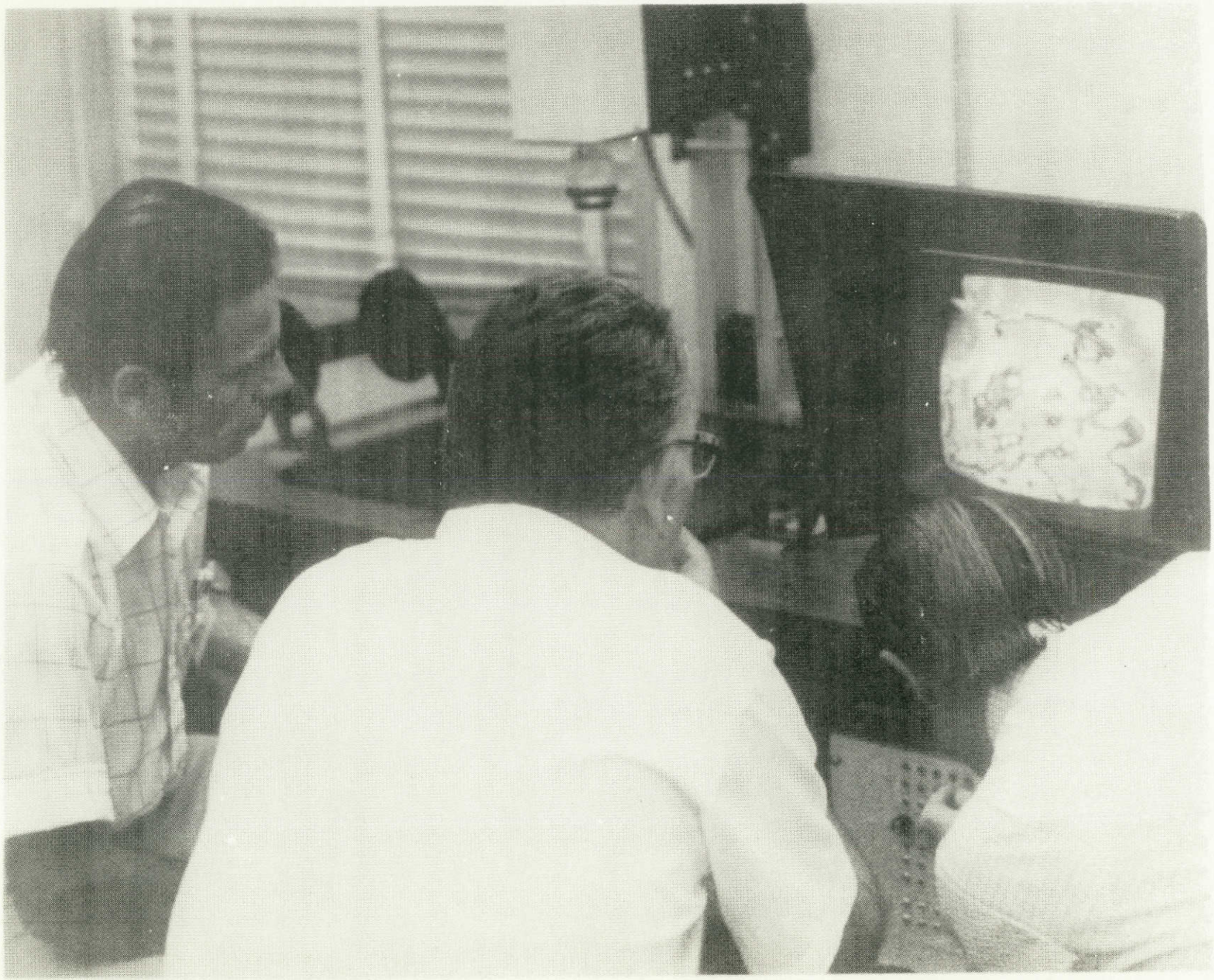


Figure 8. Quick Look Evaluation of DAPS Imagery

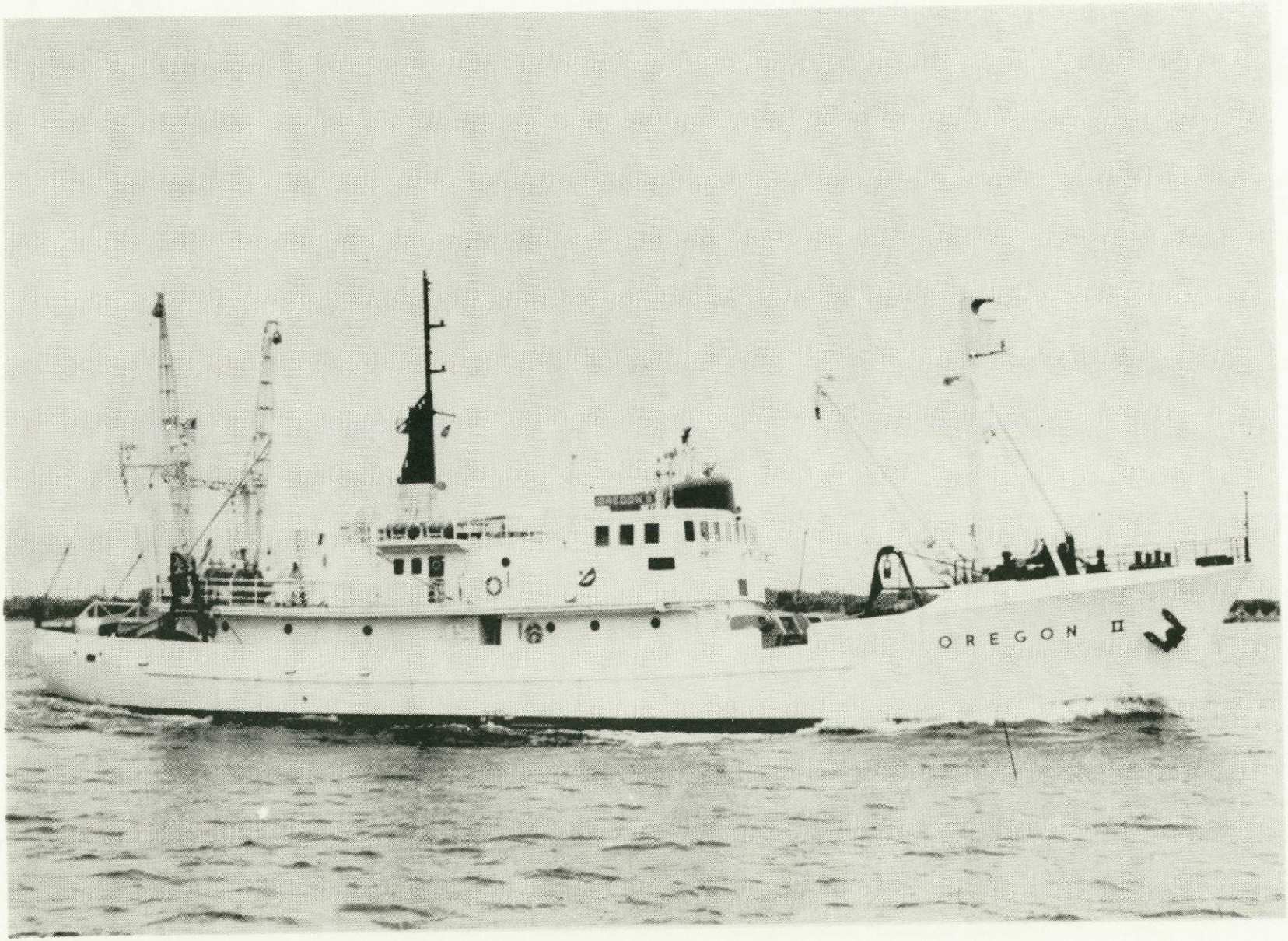


Figure 9. NOAA Research Vessel OREGON II

Figure 10. NOAA Research Vessel GEORGE M. BOWERS

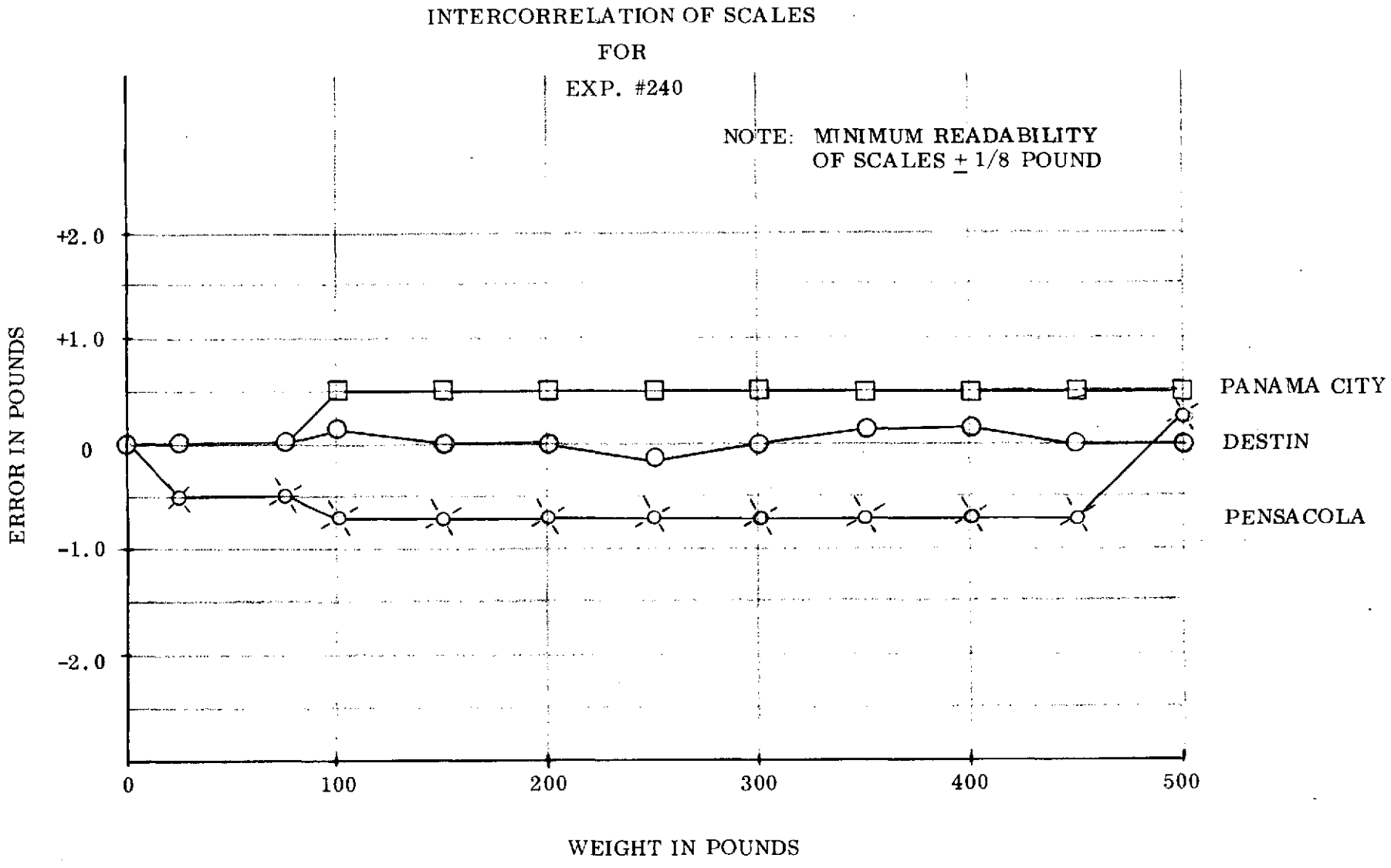


Figure 11. Intercorrelation of Scales

During early July a survey was made at marinas along the coast for charterboats which could be contracted to perform during the 4, 5 August operations as sea truth acquisition platforms. Requirements for selection were Loran navigation equipment, alternating current for use on a chlorophyll vacuum pump and a small freezer for freezing chlorophyll filters. Since data teams with equipment would be embarked, a minimum length of 40 feet was required. Also, it was considered that boat fuel capacity should be adequate to permit the boat to remain out overnight.

Two boats from Orange Beach, Alabama, two from Destin and one from Panama City eventually were selected and contracted to perform the requested oceanographic research tasks. These five plus the four Government research vessels - OREGON II, ERL, KINGFISH II and BOWERS - comprised the nine oceanographic surface platforms planned for use in collecting sea truth. Task teams were selected to embark on each vessel, boat kits of instruments were assembled and instructions were given in the use of equipment and the taking and recording of measurements. Table 3 gives a breakdown of the oceanographic and meteorological requirements.

Communication plans were established to have the ERL act as the hub vessel relaying and communicating with the aircraft, oceanographic vessels and the shore station at Destin. Each Information Center had a marine band receiver to monitor the fishing activity. Orange flares were deployed from the ERL and OREGON II on August 5.

In addition, the U. S. Coast Guard 8th District was notified of the tournament activities.

During the course of planning for the tournament, it was learned that the U. S. Navy out of Pensacola would have training with 50 caliber aircraft weapons on Saturday, August 4. The Navy modified its training schedule after learning of the large number of vessels planning to fish in the area.

The U. S. Navy operational command out of Jacksonville, Florida finalized plans with NMFS and NASA to drop AXBT's and dropsondes over the test area on August 5, using a Navy NP3A (Figure 12).

On July 20, the trailers were activated as Information Centers with one each located at the Rod and Reel Marina, Pensacola, Florida; East Pass, Destin, Florida; and Captain Anderson's Marina, Panama City, Florida. Coordinators manning the Information Centers were charged with accepting additional tournament entries (Figure 13); providing invitational packages to prospective tournament participants; making necessary contacts and arrangements for oceanography observers to ride gamefishing boats; providing handouts to tournament participants; and acting as a contact for local anglers requiring tournament information. During the tournament days, the Information Center personnel would assist

Table 3. Oceanographic and Meteorological Observations

PARAMETER	INSTRUMENT	UNIT	PARAMETER	INSTRUMENT	UNIT
Sea Surface Temperature	Bucket Thermometer	°C	Air Temperature	Glass Thermometer	°C
	RS5-3	°C	Wind Speed	Velometer	kts.
				Observation	kts.
Vertical Sea Temperature	XBT	oC	Wind Direction	Observation	Compass
Water Color	Forel Ule Scale	scale		Wind Vane	Compass
Salinity	RS5-3	°/oo	Cloud Cover	Observation	%
	Water Sample	°/oo	Cloud Type	Observation	Code
Relative Irradiance	Irradiance Meter	% ftc.	Precipitation	Rain Gage	Inches
Chlorophyll (A, B, and C)	Cary 17	mg/cu.m.		Observation	Yes/No
Carotenoids	Spectrophotometer		Visibility	Observation	n.mi.
	Water Sample	mg/cu.m.	Relative Humidity	Psychrometer	%
Transparency	Secchi Disk	feet	Atmospheric Pressure	Barometer	in/Hg.
Sea State	Observation	feet			
Depth	Fathometer	fathoms			
	Precision Depth Recorder	meters			

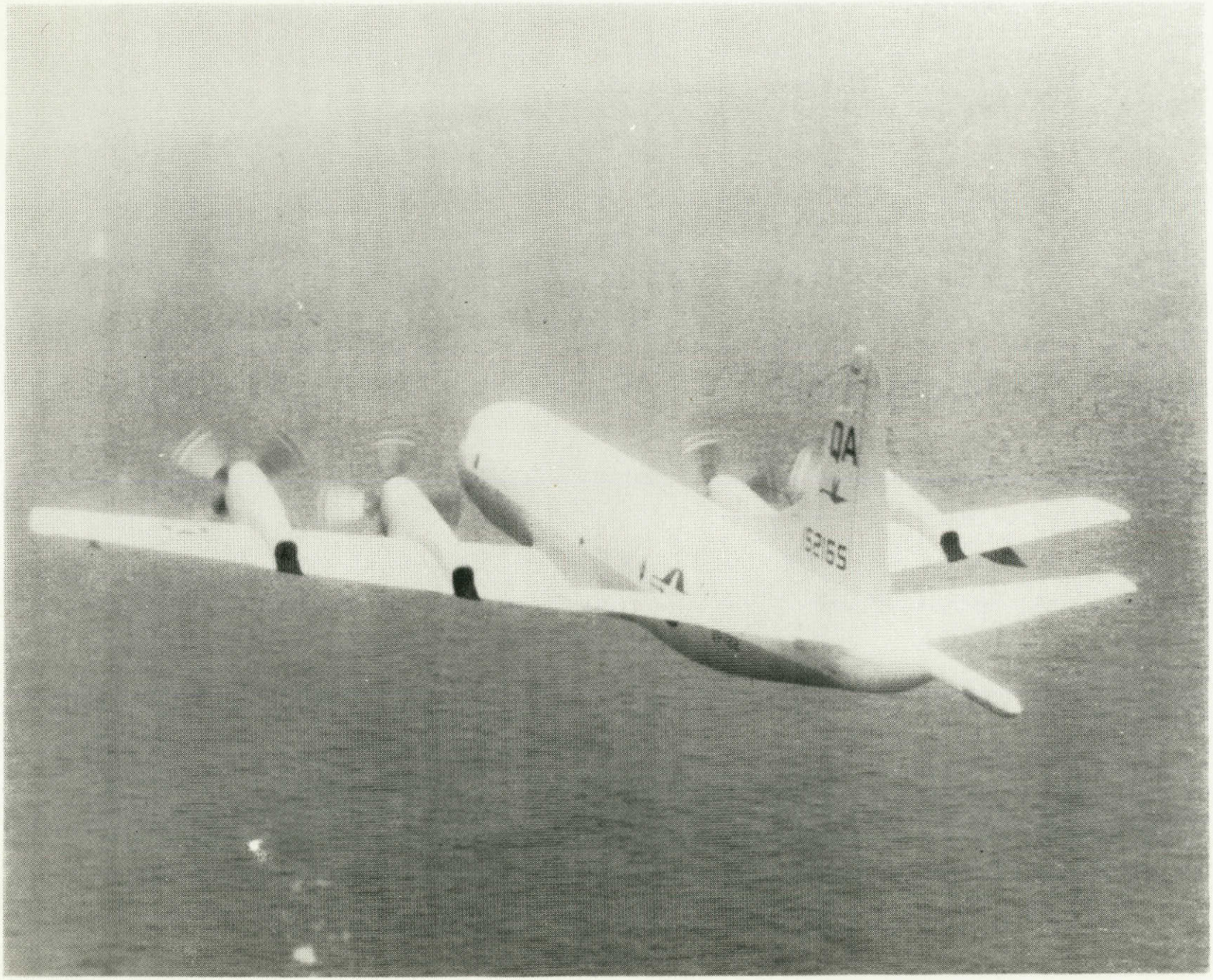


Figure 12. Navy NP3A

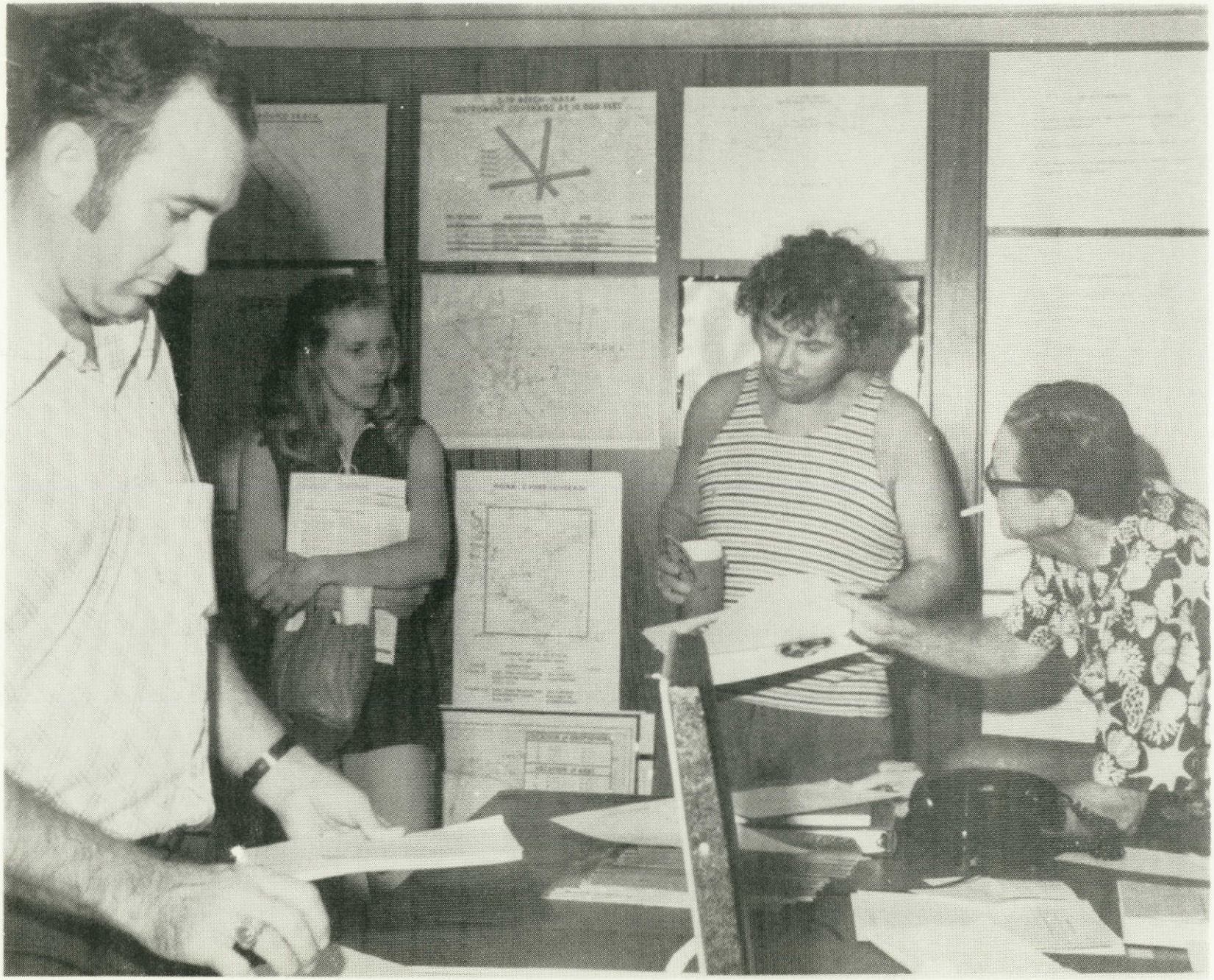


Figure 13. Registration of Tournament Entries

the port samplers in interviewing the returning anglers. The Information Centers were equipped with all the clerical supplies, charts, tournament papers, displays, and public relations handouts required for task performance.

It was planned to locate the Control Center for the entire field operation at the Destin trailer due to its centralized geographical location. Therefore, Destin was equipped with a series of wall display charts for use in quick look analysis. Table 4 is a listing of these charts which were made up from 20 inch by 30 inch white illustration board with headliner printing and covered with clear acetate for grease pencil recording of data. The Principal Investigator is shown in Figure 14 conducting a briefing from the chart display. The Information Centers at Panama City and Pensacola were provided a lesser number of charts, principally of a static nature but sufficient for local requirements.

In addition to data obtained from the designated oceanographic vessels, it was planned to acquire a subset of oceanographic data from 12 fishing boats which would be closely associated by time and location with the gamefish catches. Accordingly, boat captains were questioned on the entry forms if they would be willing to embark Government or contractor personnel (gamefish samplers) on their boats with the function of acquiring oceanographic data coincident with gamefish catches but on a non-interference basis with the boats' fishing. A very favorable response was received and Information Center coordinators proceeded to make the necessary contacts between boat owners and samplers.

Tournament boards (8 ft. by 5 ft. sheet of one-half inch plywood) were mounted near each Information Center so that the status of trophy-contending fish catches might be displayed. During the tournament, catch information of significance was phoned from each checkpoint to the Destin Information Center where an evaluation was undertaken and each checkpoint was provided identical status for display. Weighmasters appointed by the Tournament Committee for each checkpoint directly supervised the weighing of catches. Figure 15 shows the tournament board at the Panama City checkpoint.

Field deployments of all personnel (see Table 1) occurred on 3 August except for the Information Center coordinators who were already on station. The Control Center was activated in Destin upon the arrival of the NMFS Principal Investigator and the NASA Technical Monitor. Last minute changes in personnel assignments were made due to the heavy port sampling load at Destin and light participation out of Panama City.

An initial decision was to select Plan A for E-18 aircraft and sea truth oceanographic operations. The selection was made after reviewing oceanographic data from the OREGON II and the BOWERS and after checking on the locations of known gamefish catches by Destin

Table 4. Status Display Charts

	General Information Charts
GI-1	Oceanic/Gamefish Project Objectives
GI-2	Participating Agencies
GI-3	Project Schedule
GI-4	Project Results
	Weather Information Charts
WI-1	Current Local Weather
WI-2	Current Local Weather Map
WI-3	Current Local Weather Charts (Use oceanographic chart 1 each August 4 and 5)
	Oceanographic Information Charts
OI-1	Oceanographic Sea Truth Observations (1 set August 4 and 1 set August 5)
OI-2	Oceanographic Station Chart Plan A (Big charts) Plan B Plan C Plan D
OI-3A	Sea Surface Temperature Chart (Overlay for each day, August 4 and 5)
OI-3B	Sea Color Chart (Overlay for each day, August 4 and 5)
OI-3C	Secchi Disc Chart (Overlay for each day, August 4 and 5)
OI-4	Preliminary Oceanographic Chart (3 overlays - Temperature, Color, Secchi, Full size #1115 chart)
OI-5	Oceanographic/Fishing Data Chart (1 per day August 4 and 5)

	Biological Information Charts
BI-1	Biological Data
BI-2	Biological Data Acquisition (1 chart each August 4 and 5)
BI-3	Biological Data Coverage (Blank fishing chart 1 each August 4 and 5)
BI-4	Skylab/Gamefish Tournament Scoreboard
	Space Information Charts
SI-1	Skylab Pass Schedule/Status
SI-2	Skylab Instrument Coverage/ Status
SI-3	Skylab Track Chart
SI-4	C130 Pass Schedule Track/Status (2 sets, 1 each August 4 and 5)
SI-5	C130 Instrument Coverage/ Status (2 sets, 1 each August 4 and 5)
SI-6	C130 Track Chart
SI-7	E18 (Beechcraft) Pass Schedule/ Status
SI-8	E18 Instrument Coverage/Status
SI-9	E18 Track Chart (3 sets August 4, 5, and 10)
SI-10	NP3A Navy Recon. Pass Schedule/ Status (AXBT overlay and dropsonde)
SI-11	NP3A Instrument Coverage/Status
SI-12	NP3A Track Chart
SI-13	DAPS (USAF Data Acquisition and Processing System/Status)
SI-14	DAPS Instrument Coverage Status
SI-15	DAPS Track Chart

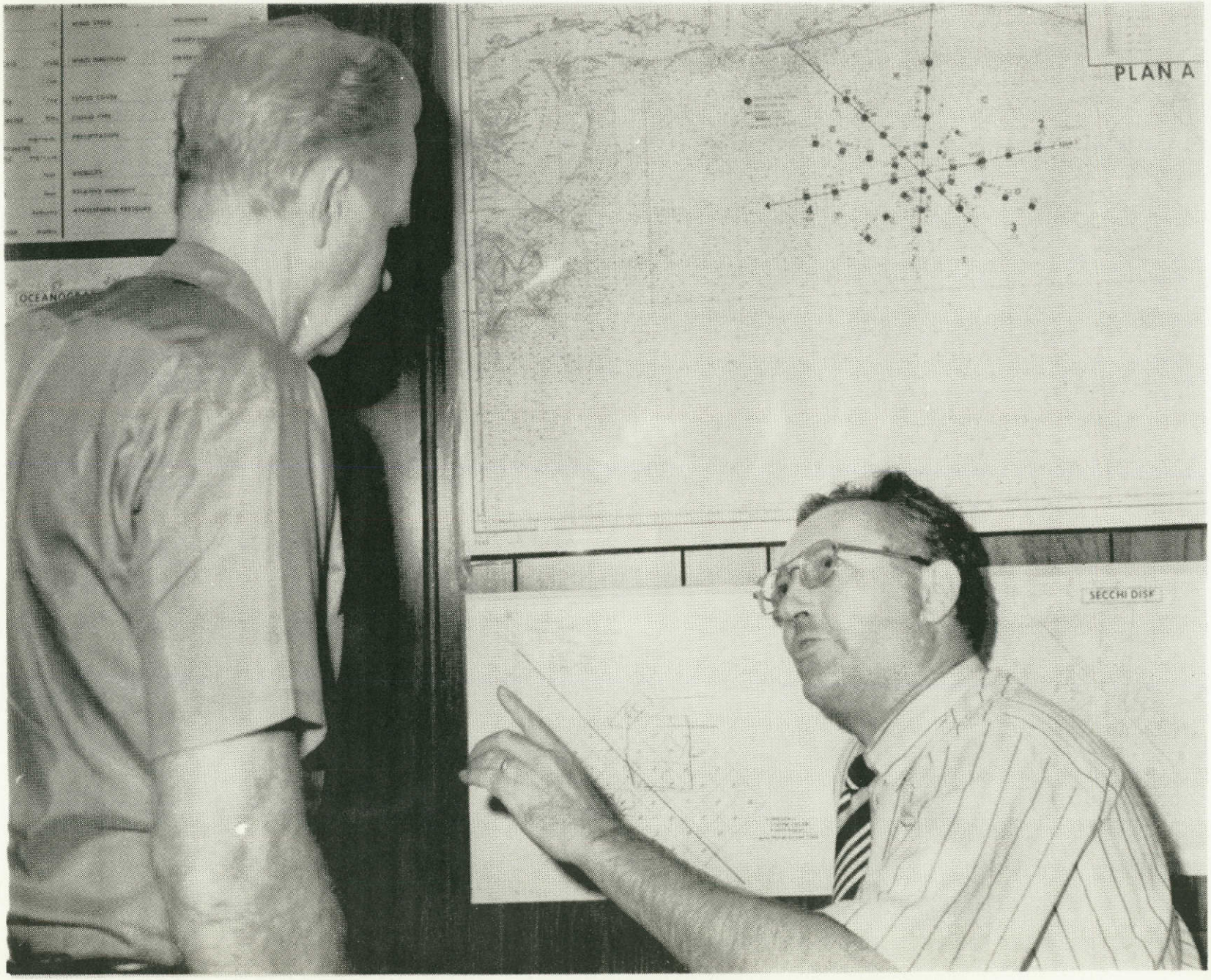


Figure 14. Principal Investigator Briefing from Chart Displays

Figure 15. Tournament Board at Panama City

charter boats during the previous few days. On 3 August, the OREGON II had approached the area from the southwest, arriving at her first sampling station at 0932 and recording measurements from then until 2005 at eight sampling stations, two more than originally planned. The BOWERS recorded at five stations starting at 1300. The measurements as radioed to Destin are shown in Table 5; those measurements for the OREGON's eighth and and last station was not received.

During the night, the BOWERS came into Pensacola Bay and lay to off the Santa Rosa Island Coast Guard Station while transferring a sick crew member, Harold Hudson, ashore. The man was taken to the emergency ward of the Baptist Hospital in Pensacola by a NMFS representative, where he underwent a doctor's examination and was released with no illness determined. He was then taken to the airport and persumably flew to his home. The BOWERS returned to sea after the transfer.

Table 5. Preliminary Oceanographic Data

Vessel	* Station/ Time	Tmp. °C	Color F. U.	Secchi Disc.-ft.	Wind Dir., Sp.	Cloud Cover Over Boat/ Over Area	Sea State	Sal. °/oo	Depth Fathoms	Barometer	Dry/Wet Bulb
OREGON	72/0930	29.5	5	27	W 8	98%/50%	3	14.7	650	29.2	87/79
OREGON	73/1037	30.3	4	27	W 8	98%/50%	3	14.5	550	30.4	88/18
OREGON	74/1137	29.4	4	23	W 8	98%/50%	4	14.5	475	30.8	89/79
OREGON	75/1240	30.1	5	20	W 2	98%/50%	4	14.4	366	30.4	88/79
OREGON	53/1407	30.6	4	27	0	98%/50%	2	28.1	205	30.0	88/77
OREGON	62/1740	29.3	3	35	E 1	-	1	28.2	163	29.0	85/77
OREGON	64/1900	30.2	3	45	SE 4	-	2	31.4	98		87/78
BOWERS	76/1300	29.8	5	7	WNW 4	98%/50% Type A. S.	1	22.1	560		84/19
BOWERS	77/1500	29.8	5	14	WNW 2	98%/50% Type A. S.	1	27.5	562	30.7	82/76
BOWERS	78/1615	30.0	5	13	NW	95%/99%	1	24.3	457	30.3	82/76
BOWERS	79/1725	30.1	5	14	N 2	-	1	24.9	350	30.3	83/77
BOWERS	80/1840	30.3	4	32	NW 1	-	1	28.6	300	30.8	86/77

* Station 72 - 28°53'N, 87°21'W
73 - 29°01'N, 87°14'W
74 - 29°10'N, 87°10'W
75 - 29°19'N, 87°05'W
76 - 29°07'N, 87°56'W
77 - 29°12'N, 87°42'W

Station 78 - 29°16'N, 87°33'W
79 - 29°20'N, 87°24'W
80 - 29°22'N, 87°16'W

Stations 53, 62, 64 shown on Figure 4.

SECTION 7

OPERATIONS

The first day of operations, 4 August, dawned with overcast skies. A weak weather front, slowly moving southeast, extended from the coast in the vicinity of Destin southwest through the operating area. Occasional squalls occurred during the day of sufficient severity to hamper surface activities but not cause more than a few cancellations. A persistent low cloud ceiling precluded air operations. Surface winds varied from 8-14 knots increasing during squalls with high seas. During the night, the frontal system moved out with conditions rapidly improving Sunday morning, 5 August. By midmorning, surface visibility was excellent with ceiling unlimited except for about 10 to 40 percent cloud cover. During the day, wind and surface conditions were generally calm, except in thundersqualls occurring with increasing frequency in the afternoon. A number of waterspouts were sighted on 4 August as seen in Figure 16.

All oceanographic boats were on station at 0900 as scheduled on 4 August and commenced taking data at their respective sampling stations except for the CAP'N DUSTIN which radioed about 1015 that she was returning to Orange Beach, Alabama, with an engine malfunction. The KINGFISH II also experienced difficulties and returned to Panama City, Florida for generator and Loran equipment repairs. Because of these two boat difficulties, no data sets were collected at stations 48, 49, 50 and 51 (Figure 5) and only one of two data sets were collected at stations 63, 64 and 65. All other data were collected despite the squally weather, which occasionally restricted operations of the NASA R/V ERL with its low freeboard. Figure 17 shows the ERL on station during a calm period.

The ERL experienced difficulty with rough seas, six foot swells and 20 knot winds after clearing the sea buoy at Pensacola Harbor entrance. Despite a 0200 departure from the Coast Guard Station, Santa Rosa Island, she radioed that she would be late on station 41 at the hub of the surface transects unless the weather moderated. Anything less than a full scale participation by the ERL was a matter of concern. In addition to obtaining oceanographic data, she provided an important communication link on 2638 khz and 6.982 mhz; and, also, carried a radio beacon so that the aircraft could more accurately fly their transects. Although forced to slow to six knots, the ERL did make station before 0900 and remained there during the day. Early in the evening, she withdrew inshore and lay to overnight.

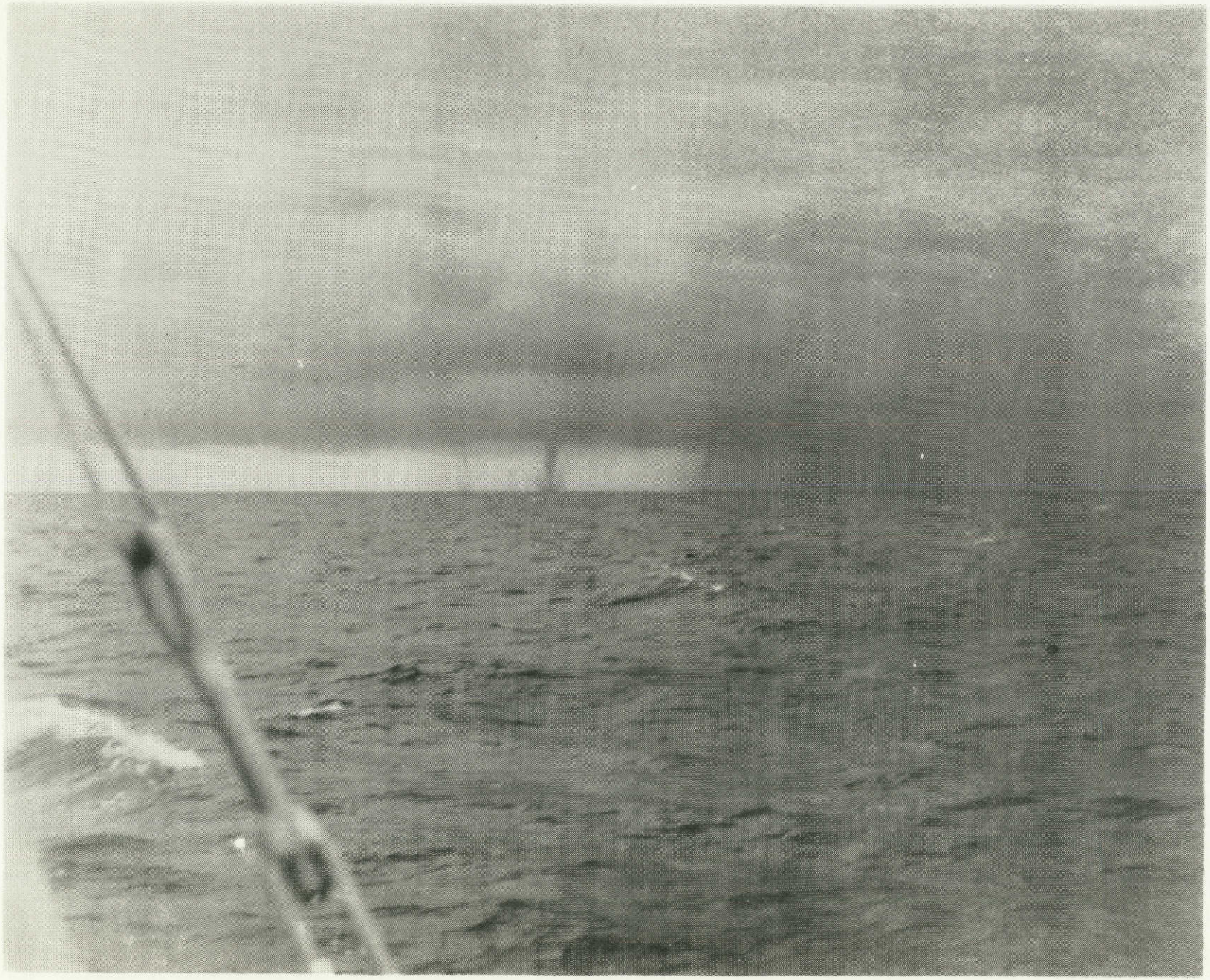


Figure 16. Waterspout

Figure 17. NASA R/V ERL on Station 41

On the following day, 5 August, all oceanographic boats collected data as planned until 1830 except that the OREGON II and BOWERS were released early to return to port; the MARIC IV missed two stations because of thundersqualls; and the ERL was released from station at 1800. The GLORY out of Destin replaced the CAP'N DUSTIN which could not be made ready for operations the second day. Equipment repairs to the KINGFISH II permitted that vessel to perform adequately the second day.

The E-18 aircraft (Figure 18) staged into Fairhope Field, Alabama, from Stennis Field, Mississippi, about 0840 4 August and then took off for the operating area at 1100, returning minutes later and reporting visibility less than a mile. The following day, the E-18 flew at 10,000 feet altitude with all requested sensors operative on transect or flight line 1 (Figure 4) from 0920 to 0955; line 2 from 1025 to 1057; and line 3 from 1114 to 1142 at which time the E-18 was released to return to base.

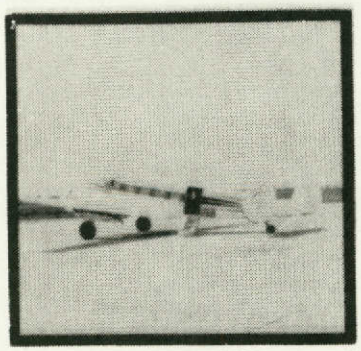
The NC130B (Figure 19) was staged through Eglin AFB from Houston in the early morning of 5 August and flew at 20,000 feet altitude on transect or flight line 2 from 0842 to 0900; line 3 from 0911 to 0925; and line 1 from 0942 to 0956. The aircraft reported cloud cover less than 10 percent at the completion of the first pass over the area. Sensors reported in use were the multispectral scanner, reconofax IV infrared camera, Hasselblad camera, boresight cameras, precision radiation thermometer and the environmental systems. Although not reported, the I^2S and RC8 cameras were also used.

The Navy NP3A from Jacksonville, Florida, appeared over the area at 0950, 5 August, at 1200 feet altitude. The aircraft had no dropsonde capability due to altimeter troubles but did drop the airborne expendable bathythermographs, completing at 1045 and returning to Jacksonville.

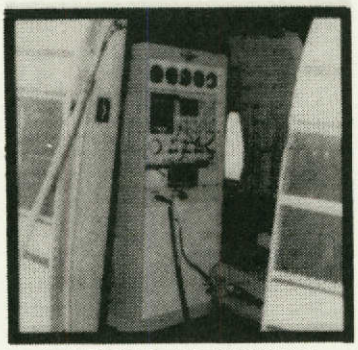
The Skylab (Figure 20) overpass occurred at 1140 in clear weather. It transited the area in 40 seconds. The aircraft transects had been completed by this time because aircraft operations had been deliberately moved up in time since weather forecasts indicated a possible cumulonimbus buildup occurring before noon and obscuring the area for aerial photography. If the buildup were to occur and preclude obtaining Skylab EREP imagery, Plan C or D could be activated to run surface transects during the following week and obtain EREP imagery on the next satellite overpass on 10 August. Fortunately, the thunderhead buildup occurred later in the day and both EREP and aircraft photography/imagery were obtained during excellent weather although not quite concurrently. There was no need to activate Plan C or D.

Sportsfishing boats were generally underway at first light on 4 August in order to make the passage to the fishing area and commence trolling at 0900. Figure 21 shows boats of the Destin fleet leaving the marinas and making for East Pass preparatory to entering the Gulf.

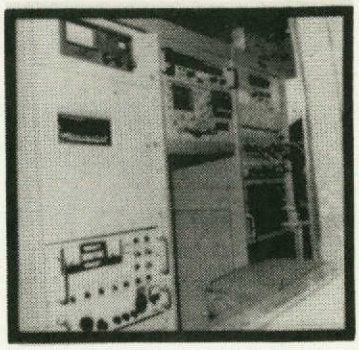
LIGHT AIRCRAFT REMOTE SENSING SYSTEM



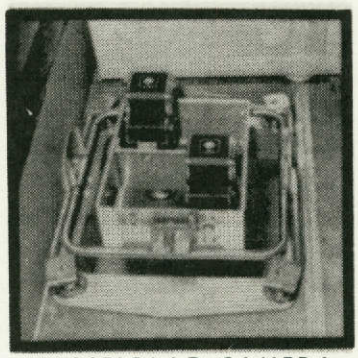
AIRCRAFT



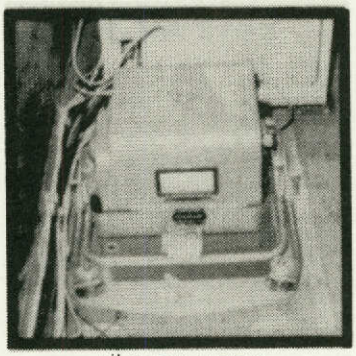
CAMERA/SCANNER CONTROL



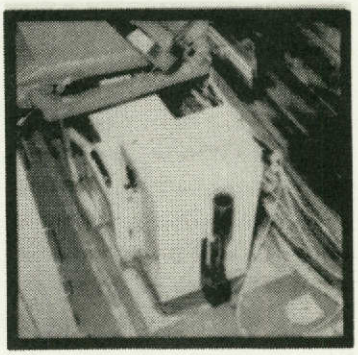
DATA SYSTEM



HASSELBLAD CAMERA

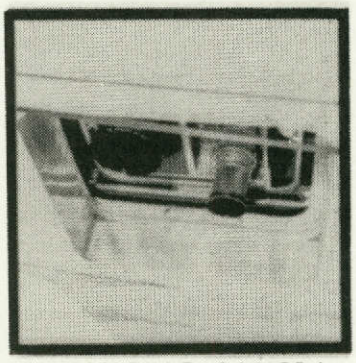


I²S CAMERA



SPECTROMETER

INTERNAL VIEWS



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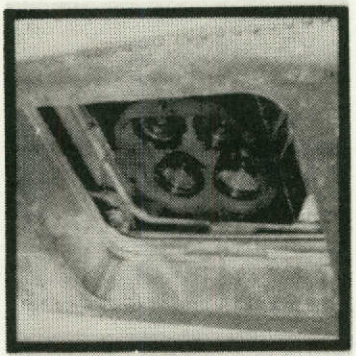

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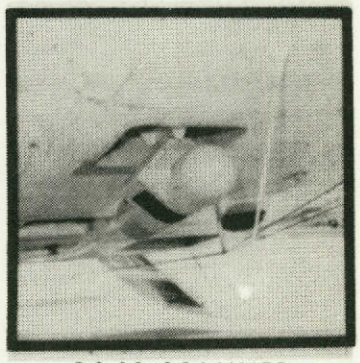

RS-18 SCANNER

EXTERNAL VIEWS

Figure 18. NASA E-18 Aircraft and Instrumentation

Figure 19. NASA Earth Survey Aircraft NC130B

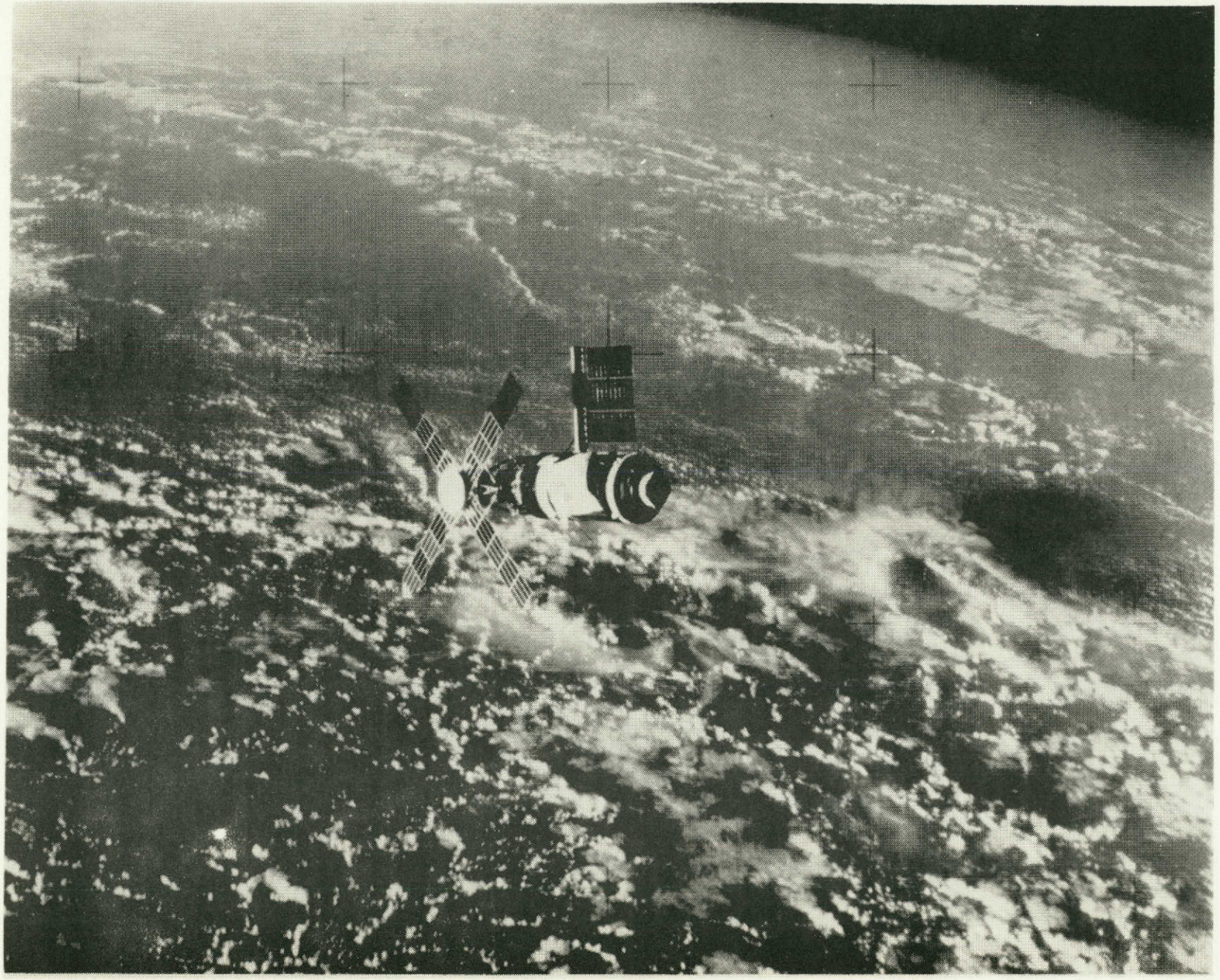

Figure 20. Skylab

Figure 21. Boats of the Destin Fleet Putting to Sea

Dependent on boat speeds and the particular area fished, some boats were able to get their lines in the water before 0900 and start trolling. From the point of view of fish catch data requirements for the project, this was quite acceptable. However, according to tournament rules, fish caught before 0900 and after 1500 were not eligible for prizes under tournament rules, and a considerable number of catches were disqualified because of the time factor. However, the catch data was welcome for the project.

A number of boats remained out in the area overnight and fished well into evening twilight, also getting an early start the next morning. Because of the fuel shortages and the long trip in and out, it had been anticipated that a few boats would choose this course of action. The OREGON II had been directed to remain near the center of the fishing area during the night and also to take aboard for cold storage any gamefish as requested. A number of boats took advantage of this option. For example, the LITTLE MAMA from Mobile off-loaded a white marlin and a dolphin before streaming a sea anchor for the night. Both the THIN FIN and the LADY EVE tied up in tandem astern of the LITTLE MAMA to take advantage of the latter's sea anchor and minimize drift. By eyewitness observation from the deck of OREGON II the lights of seven sportsfishing boats could discerned as they lay to in the vicinity during the night of 4, 5 August.

Based on the Gamefish Boat Logs, the boat participation by checkpoint appears to have been the following:

Date	Pensacola	Destin	Panama City	Total
4 August	26	50	6	82
5 August	24	39	6	69

One boat, the WIDOWMAKER, actually operated out of Port Eads, Louisiana, at the mouth of the Mississippi on both days of the tournament returning each night to Port Eads. Another, the YOSTOTGA operated from its base marina at Orange Beach, Alabama. Gamefish Boat Log data from this category of participant was either mailed or phoned in. However, most boats from distant marinas put in temporarily at local marinas arriving either late on 3 August or on the evening of 4 August after completion of a day's fishing.

Activities at the checkpoints were rushed between the hours of 1700 and 1900, particularly on the second and last day of the tournament. As many as six white marlin lay on the landing at Destin at one time as the weighmaster processed them through weigh-in. Three port samplers were simultaneously interviewing boat captains, obtaining catch measurements (Figure 22) and completing the boat logs while several secretaries were obtaining names and addresses of anglers. Table 6 gives the type of information which the port

Figure 22. Port Samplers Obtaining Catch Measurements

Table 6. Fish Observations

PARAMETER	INSTRUMENT	UNIT
Species I.D.	Observation	Common Name
	Port Sampler	Common Name
Time Fish Hooked	Observation	Local Time Hour/Minute
Time Fish Raised	Observation	Local Time Hour/Minute
Time Fish Lost	Observation	Local Time Hour/Minute
Time Fish Boated	Observation	Local Time Hour/Minute
Bait	Observation	Common Name
Water Color	Observation	Color Description
Surface Conditions		
(Grass, Rips, Etc.)	Observation	Description
Location of Fishing	Loran	Square
	Dead Rec/Compass	Square
Fishing Time Start	Observation	Local Time Hour/Minute
Fishing Time End	Observation	Local Time Hour/Minute
No. Rods Fished	Observation	Number
Bait Fished	Observation	Common Name
Billfish Girth	Measurement	Cm
Billfish Sex	Observation	
Billfish Weight	Measurement	Pounds
Billfish Length		
Lower Jaw to Fork	Measurement	Cm
Orbit to Fork	Measurement	Cm
Gamefish No. Caught	Count	Number
Gamefish Time Caught	Observation	Local Time Hour/Minute
Anglers Name	Log	First Mi. Last
Anglers Address	Log	Street, City, State, Zip
Anglers Telephone	Log	Area Code and Number
Anglers Catch	Log	Refer to GE Log
Boat Captain/Owner	Registration	First Mi. Last
Boat Name	Registration	
Boat Length	Registration	Feet
Radio	Registration	Channel/Frequency

samplers were checking. Other project personnel were handing out tournament patches and boat decals to boat captains and anglers as they were debriefing. Boat traffic along the dockside was heavy as one or two boats might be casting off while several were making an approach. Four boats may be seen in Figure 23 clustered around the east end of the Destin checkpoint landing.

Figure 23. Activity at the Destin Checkpoint

SECTION 8

POSTOPERATIONAL ACTIVITIES

The OREGON II docked at a Navy Laboratory landing, Panama City, about 2130 5 August and offloaded gamefish catches and oceanographic samples and instrumentation equipment. The fish were trucked to the checkpoint, weighed and readings phoned in for incorporation into the tournament results. In the meantime, the GEORGE M. BOWERS transferred oceanographic samples and equipment to the ERL at sea and proceeded to port at Pascagoula, Mississippi. The OREGON II and BOWERS rendezvoused off Mobile Bay over Scallop Beds at 2130 on 6 August and resumed shadowgraph operations, having completed their commitment to the Skylab Gamefish Project.

The NASA ERL returned to the Coast Guard Station, Santa Rosa Island, in the evening 5 August, refueled and returned the following day to her home port at Gulfport, Mississippi.

The KINGFISH II and the Government-chartered oceanographic boats returned to their respective ports in the evening of 5 August. The latest returning were probably the GLORY docking in Destin at 2345 and the KINGFISH II in Panama City shortly after midnight. The data task teams disembarked with logs and equipment and individually returned to the MTF the next day.

Processing of raw data commenced at the MTF on 7 August by which date all Gamefish Boat Logs and Field Measurement Load Forms (oceanography and meteorology) had been returned. The gamefish samplers had turned over their load forms and sampling kits to the Information Center personnel after disembarking from their respective host gamefishing boats on 5 June. These, together with Gamefish Boat Logs and the Angler Logs were returned to the MTF by Center coordinators.

All Information Centers were deactivated on 6 August. Expendable tournament boards were turned over to local organizations for use as not meriting the transportation expense of return to MTF. All other Government property, consisting principally of unused expendables, was returned by the coordinators. Power and telephone service to the trailers was discontinued and the trailers were towed away by the rental firm. A representative of the MTF technical services contractor was present at the operation and concluded all contractual obligations.

A meeting was held at the Gulf Breeze Holiday Inn on the morning after the tournament with the Project Principal Investigator, Co-Investigators, Technical Monitor and Dr. Neth

of the Pensacola Big Game Fishing Club attending. Discussion items were the tournament results, the recognition banquet and invitation list and general matters relating to windup of field activities. A second debriefing meeting at the MTF on 10 August was attended by Government and contractor personnel who had participated in the field operations.

SECTION 9

RESULTS

The satellite sensor coverage is shown in Table 7. The sensors are identified, a brief description furnished and the footprint given. As indicated, the sensors were operating with excellent weather conditions but the prints/film/tape are not available at this time to determine quality or usefulness except for the DAPS and NOAA-2 imagery which is acceptable.

Table 8 gives the aircraft sensor coverage for the three aircraft types, identifying the respective sensors with footprints and descriptions. Copies of imagery taken by the NC130B have been received via the NASA quick look document. The following table indicates the change in NC130B sensors from the initial statement of requirements to film receipts.

DOCUMENT	NC 130B SENSOR							
	RECON IV	I^2S	RC8	AMPS	MSS	KA62	PRT5	HASS'D
Requested by FEL Requirements for A/C Support, 16 March			X	X	X	X	X	
Approved by NASA Project Support Plan, 10 May	X		X	X	X		X	X
Received by NASA, Quick Look Report, 11 Sept.	X	X	X	X	X			

The oceanographic research vessels, both Government and Government charter, are identified in Table 9 by number, name, sampling station and the number of sets of observations taken. The chart in Figure 5 locates the boat transects and stations by number.

Table 10 lists the gamefish samplers, the boats on which they embarked and the number of sets of oceanographic information taken by each. Also, are listed the gamefish catches by boat. A set of oceanographic data was taken with each catch. All oceanographic measurements are available in computer tabulations.

Table 7. Satellite Sensor Coverage

SKYLAB EREP				
INSTRUMENT	DESCRIPTION	FOOTPRINT	USE	STATUS
S190 A	6 Cameras	88 n. mi. sq.	Water Mass Boundaries and Water Color	Obtained 5 August
S190 B	1 Camera	59 n. mi. sq.	Water Mass Boundaries and Water Color	Obtained 5 August
S191	Infrared Spectrometer	.235 n. mi. sq.	Sensor Calibration	Obtained 5 August
S192	Multispectral Scanner	37 n. mi. wide	Water Color, Sea Surface Temperature	Obtained 5 August
S194	Microwave Radiometer	60 n. mi. wide	Surface Salinity Potential	Obtained 5 August
NOAA-2				
VHRR-IR	Very High Resolution Radiometer, Infrared	-	Sea Surface Temperature	Obtained 4, 5 August
VHRR-VIS	Very High Resolution Radiometer, Visual	-	Sea Surface Features	Obtained 4, 5 August
DAPS				
IR	Infrared Scanner	-	Sea Surface Temperature	Obtained 31 July - 5 August
Visual	Reflectance Image	-	Surface Features	Obtained 31 July - 5 August

Table 8. Aircraft Sensor Coverage

INSTRUMENT	DESCRIPTION	FOOTPRINT	USE	STATUS
NASA C 130 B				
MSS	Multispectral Scanner	6.4 miles width	Water Color	Obtained 5 August
RECON IV	Infrared Scanner	3.8 miles width	Water Temperature	Obtained 5 August
AMPS	Airborne Multispectral Photographic System	1.23 miles width	Water Color	Obtained 5 August
RC8	Camera System	2.5 miles	Water Color	Obtained 5 August
I^2S	4 Camera Photographic System	3 miles width	Water Color	Obtained 5 August
NASA E-18				
RS-18	Thermal Infrared Scanner	4.1 miles width	Sea Surface Temperature	* Obtained 5 August
K-17	Camera Ektachrome Color	2.8 miles width	Location of Vessels	Obtained 5 August
EL 500	Camera - Hasselblad Color IR	1.4 miles width	Water Color	Obtained 5 August
PRT 5	Precision Radiation Thermometer	350 feet width	Sea Surface Temperature	Obtained 5 August
E 20 D	Spectrometer	345 feet width	Water Color	* Obtained 5 August
*Note: Date unusable for 7 minutes of flight line 1.				
NAVY P3A				
AXBT	Aerial Expendable Bathythermograph	-	Vertical Water Temperature	Obtained 5 August
PRT-5	Precision Radiation Thermometer	-	Sea Surface Temperature	Obtained 5 August

Table 9. Oceanographic Sampling

BOAT NO.	BOAT NAME	SAMPLING STATIONS*	NO. OF SETS OF OBSERVATIONS*	DATES	DATA TEAM
1	ERL	41	14	4,5 August	A. D. Peresich T. R. Lemon H. K. Polk D. L. Powell
2	NO HU HU	44,45,46,47	14	4,5 August	Dr. R. H. Cartmill Dr. B. H. Atwell
3	RACHEL	54,55,56,57	14	4,5 August	H. T. Worthington V. A. Lambert
4	OREGON II	72,73,74,75, 53,62,64,46	8	3 August	Shadowgraph Team
		53,52,71,43,42	16	4,5 August	
5	CAP'N DUSTIN	No data taken - returned to port with engine malfunction			K. G. Breisacher M. McIntosh
6	MARIC IV	37,38,39,40	12	4,5 August	J. D. Derbonne B. G. Edwards
7	GULFSTREAM	58,59,60,61	14	4,5 August	B. Skipper G. D. Jarrell
8	KINGFISH II	62,63,64,65	11	4,5 August	H. D. Owens J. E. Jones J. Brashier
9	BOWERS	76,77,78,79,80	5	3 August	Rufas Team
		70,69,68,67,66	15	4,5 August	
5	GLORY (Replacement for CAP'N DUSTIN)	48,49,50,51	7	5 August	K. Breisacher M. McIntosh

*Observations - Station, date, time, surface water temperature, surface water salinity sample, air temperature, wet and dry bulb psychrometer readings, wind direction and speed, Secchi visibility, sea state, water depth, Forel-Ule water color, chlorophyll sample.

Table 10. Fishing Vessel/Oceanographic Data
(by Gamefish Samplers)

VESSEL NAME	PORT	NMFS SPONSORED PERSONNEL (GAMEFISH SAMPLERS)	NO. OF SETS OF OBSERVATIONS*	FISH BOATED
Baby Link	Pensacola	J. Benigno	7	Sailfish (1), White Marlin (1), Dolphin (2), Wahoo (1)
Astro	Pensacola	R. Minkler	10	Dolphin (1)
Thin Fin	Pensacola	T. Flynn	5	Dolphin (2)
Buddie B	Pensacola	T. Lamunyon	7	Wahoo (1), Dolphin (1)
Ole Salt	Destin	A. Magill	6	Wahoo (1)
Sandpiper	Destin	C. Rothmayr	Unknown	Shark (1), White Marlin (2)
How Nice	Destin	B. Fuller	3	White Marlin (1)
Sica	Destin	B. Fuller	3	-
Su-Nan	Destin	B. Fett	5	-
Miss Cindy	Destin	L. Odom	6	White Marlin (1)
Lady M	Panama City	F. Wittmann	7	White Marlin (4)
Sugar Foot	Destin	T. Leming	6	Dolphin (1)
Crosswinds	Panama City	J. Anderson	10	-

*Observations - Boat square, date, time, water surface temperature, air temperature, wet and dry bulb readings, Secchi disc visibility, sea state, depth, water salinity samples, Forel-Ule water color, surface visibility, cloud cover and type, precipitation (yes or no).

The total fish catch by species for the 4, 5 August period is shown by Table 11. This summary information is available in computer tabulations which also give catch by boat and fishing pressure in terms of fishing line time for each ten mile fishing square (Figure 4). Most fish were caught in Block 28.

The tournament awards are listed in Table 12 by boat and angler. The angler awards are by species and it may be noted that no fish in several tournament categories were boated, e.g., blue marlins and the tunas (minimum 50 pounds weight each). The boat trophies were awarded on the basis of the total weight of tournament fish boated by boat.

Out of 482 invitations mailed to anglers, captains, and owners, approximately 325 people and 139 boats registered for participation in the two day tournament. A number of the 139 boats were unable to participate at the last minute due to charter cancel, mechanical problems, failure to obtain a crew, etc.

Table 11. Fish Catch

Fish Species	No. Raised But Not Hooked		No. Hooked		No. Lost		No. Boated	
	4 August	5 August	4 August	5 August	4 August	5 August	4 August	5 August
Blue Marlin	5	3	6	5	6	5	0	0
White Marlin	25	19	32	23	9	14	23	9
Sailfish	4	5	10	4	6	3	4	1
Blackfin Tuna	0	0	1	1	1	0	0	1
Dolphin	2	0	32	43	5	5	27	38
Bonito	0	0	2	1	0	0	2	1
Wahoo	4	0	10	6	2	3	8	3
King Mackerel	0	0	1	0	0	0	1	0
Billfish	2	3	1	0	1	0	0	0
Unknown	4	0	3	2	3	2	0	0
Shark	2	0	1	2	0	0	1	2
Total Each Day	48	30	99	87	33	32	66	55
Tournament Totals	78		186		65		121	

Table 12. 1973 Skylab Gamefish Tournament Awards
(in order of presentation at recognition banquet)

Appreciation (Plaques) to Weighmasters

	Checkpoints	Names
1.	Panama City	Roy Martin
2.	Destin	Donald Snellgrose
3.	Pensacola	John Sauer
4.	Pensacola	Bill Mathers
5.	Pensacola	Rod Parish

Angler Awards (Trophies)

	Third Place	Pounds	Boat	Angler	Port - Checkpoint
5.	Sailfish	27-3/4	Happy Hooker	C.K. Marshall	Destin/Shalimar
6.	White Marlin	68-1/2	Smarty Pants	Ed Miller	Destin/Tallahassee
	Second Place				
7.	Dolphin	33-1/2	Dulcinea	Tom White-Spunner	Pensacola
8.	Sailfish	41-1/2	Baby Link	Mac Jeffcoat	Pensacola
9.	White Marlin	70-1/2	Crosswinds	Don Meyling	Destin
	First Place				
10.	Dolphin	34-1/2	Striker	Ted Jones	Destin/Shalimar
11.	Wahoo	38-1/4	Blusky Doodle III	Bob Radcliffe	Pensacola
12.	NOTE: Mr. Bechtold not present - will mail trophy.				
	Sailfish	52	Wahoo	Bob Bechtold	Destin
13.	White Marlin	71	Caroline	Ed Chadbourne, Jr.	Pensacola

Boat Awards (Trophies)

		Total Points	Captain	Boat	Port - Checkpoint
14.	Third Place	118	J. H. Dunlap	Sandpiper	Destin
		118	Jim Braden	Crosswinds	Destin
15.	Second Place	130-3/4	Bob Oliver	Happy Hooker	Destin
16.	First Place	224-1/4	Sonny Inscho, Jr.	See Spray	Destin

SECTION 10

CONCLUSIONS AND RECOMMENDATIONS

Acquired data is considered adequate to undertake a feasibility correlation between remote sensing imagery and gamefish distribution and abundance. The weather break on Sunday, 5 August was opportune for space and aerial imagery/photography. Also, there was a marked improvement in the incidence of gamefish catches over expectations based on June and July gamefishing.

A considerable overtime expense was incurred in meeting deadlines occasioned by re-scheduling field operations to early August from mid-September. Lead time was limited to five weeks whereas eight weeks might have eliminated the need for overtime.

Radio communications between vessels and checkpoints could have been improved.

The enthusiastic response of sportsfishermen exceeded expectations by far. It might even have been more spectacular particularly among charter boat captains had they had more advance notice to arrange charters.

The success of the experiment was directly related to the comprehensive planning that took place prior to the experiment. Only minor adjustments in plan activities were required while the plan was being implemented.

Overall the field operations could only be described as successful. This was due to the outstanding efforts of a number of personnel and organizations. It is recommended that appropriate recognition be given to each. Specific details on recognition have been reported under separate report.