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November 11, 2009

MEMORANDUM

VIA EMAIL

TO: Cook Inlet Stakeholder

FROM: Monty Worthington *mworthington@oceanrenewablepower.com*

SUBJECT: **ORPC Cook Inlet Tidal Energy Project Status Report No. 5
FERC Permit No. P-12679**

Study Activities completed October 2009

Pre-Deployment Beluga Observations

The beluga whale observations were continued in October with a total of 13 observation days (96.5 hours) from the observation tower set near Race Point on Fire Island. The observation teams chartered a small fixed-wing aircraft to travel daily between Anchorage and Fire Island, and also looked for beluga whales during the flight. Beluga whales were not observed at any location during any of the 13 observation days in October or seen during any of the crew-transport flights. No birds on the water in or near the Deployment Area or marine mammals were sighted during the 13 observation days. LGL's monthly progress report for beluga monitoring is attached for reference.

Pre-deployment hydroacoustic fish surveys

As noted in Status Report#4, a survey was attempted on September 30th but was aborted due to hazardous weather conditions. A successful survey was completed on October 5th. After further consideration of the survey results to date and discussions with resource agency staff, it was decided not to attempt a second survey in October prior to the boat ramp removal on the 15th.

The October 5th fish survey trip report is attached to this status report. The October 5th survey conditions were good and all three sub-surveys (ebb and flood tide and evening) were completed. A surface drift gill net and trawl net were conducted for target verification. No fish were



collected in the drift gill net but a total of 45 minutes of trawling time resulted in the following catch:

Surface Trawl - 1 nine-spine stickleback (45 millimeters), 1 juvenile cod (80 millimeters), 179 amphipods (15 to 20 millimeters), 297 shrimp (10 to 60 millimeters).

The water quality data for October 5th has been received and is also attached to this status report. Salinity, dissolved oxygen (DO), and temperature continue to remain uniform with depth while turbidity levels are variable. Salinity and DO levels remained within a narrow range of 11.5 to 12.4 psu (practical salinity units = parts per thousand) and 10.07 to 10.13 milligrams per liter, respectively. Temperatures ranged from 8.97 to 9.17°C. With the exception of the top 1 meter surface water, turbidity levels varied from 413 to 460 ntu, generally increasing with depth.

The preliminary hydroacoustic data analysis for the September 23rd and October 5th survey events have been completed and are attached to this status report. Target depth information is referenced to the National Oceanic and Atmospheric Administration's predicted mean lower low water elevation. Aquacoustics, Inc. is completing a more detailed data analysis including evaluation of fish density trends by tidal cycle, diurnal trends, and spatial differences, in addition to 3 D graphics. This more detailed analysis will be provided in the study report. Examples of the revised 3-D GIS graphics are attached to this report.

The set-net catch data from Fire Island provides some information on when salmon runs were coming through the general area. It appears to have been a very low turnout early in the year for Chinook salmon.

**2009 PRELIMINARY COMMERCIAL SALMON HARVEST
IN THE FIRE ISLAND (247-43) STAT AREA (UNPUBLISHED DATA,
ALASKA DEPARTMENT OF FISH AND GAME)**

Date	Chinook		Sockeye		Coho		Pink		Chum		Total	
	Daily	Cum	Daily	Cum	Daily	Cum	Daily	Cum	Daily	Cum	Daily	Cum
25-May	1	1									1	1
1-Jun	15	16									15	16
8-Jun	56	72	7	7							63	79
13-Jul		72	333	340	34	34	38	38	26	26	431	510
16-Jul		72	254	594	118	152		38	34	60	406	916
27-Jul		72	45	639	58	210		38	7	67	110	1,026
30-Jul		72	104	743	325	535		38	70	137	499	1,525
3-Aug		72	32	775	457	992		38	28	165	517	2,042
6-Aug		72	14	789	42	1,034	16	54	6	171	78	2,120
10-Aug		72	18	807	294	1,328		54	13	184	325	2,445
13-Aug		72	5	812	135	1,463		54	14	198	154	2,599
17-Aug		72	4	816	189	1,652		54	5	203	198	2,797
20-Aug		72	4	820	64	1,716		54	4	207	72	2,869
24-Aug		72	3	823	49	1,765		54	2	209	54	2,923



Velocity Survey

TerraSond has completed all stationary and mobile velocity data collection. The data is currently in post-processing.

Geo-physical Survey

TerraSond has completed all surveys (bathymetry, side-scan sonar, sub-bottom profiling and magnetometer) for the Deployment Area and the proposed subsea cable line and is currently post-processing data.

Activities Proposed for the November 2009

The beluga observations will continue for the first two weeks of November. Because of the seasonal decrease in daylight hours, the observation schedule is now four days per week to obtain a total observation target of 24 hours per week.

The Ship Creek public boat launch was closed for the season on October 15th, thus terminating the hydroacoustic fish survey.

ORPC is currently planning to schedule a public meeting for the first week of December to provide an update on the Project as well as present an overview of available study results. Additional details will be emailed out to the Project stakeholder list soon.

MTM/MW/jph

cc: E. Hauser, ORPC
D. Johnson, ORPC
M. McCann, HDR|DTA
File

ATTACHMENTS



Alaska Research Associates, Inc.

LGL Alaska Research Associates, Inc.

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Memorandum

To: Monty Worthington, ORPC AK
Mary T. McCann, HDR|DTA

From: Tamara McGuire, Marc Bourdon, Robert Kirchner, LGL

Date: October 30, 2009

Re: LGL Monthly Progress Report - October 2009

This is a progress report of a study by LGL Alaska Research Associates, Inc., sponsored by Ocean Renewable Power Company (ORPC) to monitor beluga whale presence, relative abundance, and behavior off of the north side of Fire Island, Upper Cook Inlet, Alaska. Information presented in this report provides baseline data on beluga whale presence, relative abundance, and surface behavior in and near the Cook Inlet Tidal Energy Project Deployment Area. This report covers beluga whale observation activities during October 2009.

Objectives

The study has two primary objectives:

1. Estimate the frequency of occurrence, relative abundance, and surface behavior of beluga whales in and near the Deployment Area during ice-free months of 2009.
2. Provide information to ORPC and HDR/DTA on beluga whale sightings and locations relative to the Cook Inlet Tidal Energy Project.

Monitoring Effort

Monitoring was conducted on 13 days during October 2009 (96.5 hours total, Table 1) from the observation site near Race Point, Fire Island. Observation teams chartered a small fixed-wing aircraft to travel daily between Anchorage and Fire Island. The team stayed on the island seven nights during the month due to weather that prohibited flying and/or to maximize observation time. Observers looked for belugas during the flights, and had a grid-cell map, a GPS, and a clinometer onboard to record the flight paths and any belugas sighted. Figure 1 displays the flight paths.

Environmental Conditions

Environmental conditions were recorded for every hour of observation during the month of October. Sighting conditions were ranked as good, fair, or poor, based on a combination of wind, whitecaps, sun glare, rain, haze, and fog. Sighting conditions were reported as good on two days, fair to good on one day, fair on six days, and poor on four days. Observers were able to see to the far shore (along the Susitna Flats) on all observation days; however, on one day the far shore was only visible for half of the day, and on another it was only visible for one hour (the Deployment Area was only visible for four hours on this day). Mean wind speed was 11.4 km/h, with values ranging from 0-44.3 km/h. Seas were generally calm, with a mean Beaufort Sea State of 1.8 (1 = ripples, without foam crests, and 2 = small wavelets, crests do not break). Mean air temperature was 5.7° C, with values ranging from -0.8° – 14.7° C. Rain was noted on three of the 13 field days, and fog was noted on three days.

Vessels and Vessel Activity

All vessel activity in or near the Deployment Area in the month of October was monitored by the observation crew. The LGL zodiac was seen on one day. Other vessels were observed transiting in or near the Deployment Area: seven container ships were seen on six days; tugs with barges were seen on two days; motorized barges were seen on one day. On one day the observation crew heard a large vessel passing the Deployment Area; however the vessel was not seen due to fog.

Bird Sightings

Birds were not observed on the water in and near the Deployment Area during any of the 13 observation days in October.

Beluga Whale Sightings

Belugas were not sighted during any of the 13 observation days in October. Belugas were not seen during any of the crew-transport flights. Daily flight paths are displayed in Figure 1.

Additional Marine Mammal Sightings

No marine mammals were sighted during the 13 observations days.

Upcoming Field Research

Observation sessions for beluga whales are scheduled to be conducted 24 hours per week for the first two weeks of November. Because of the seasonal decrease in daylight hours, the observation schedule was changed to four days a week in October and will remain four days a week in November.

Table 1. Monitoring effort during October 2009 is summarized by date and location.

Day	Date	Shift start	Shift stop	Total hours of observation	Tide height start (m)	Tide height stop (m)	Belugas sighted?	Belugas sighted within Deployment Area?
1	2009OCT06	12:00	19:00	7.00	6.87	1.87	No	No
2	2009OCT07	8:20	16:20	8.00	7.16	1.48	No	No
3	2009OCT12	12:00	19:00	7.00	7.6	4.26	No	No
4	2009OCT13	8:50	18:30	9.66	1.75	7.37	No	No
5	2009OCT14	9:00	18:50	9.83	3.33	8.83	No	No
6	2009OCT19	10:35	18:30	7.92	8.43	7	No	No
7	2009OCT20	8:50	16:55	8.08	8.95	1.99	No	No
8	2009OCT21	10:10	18:30	8.33	8.99	4.6	No	No
9	2009OCT22	9:00	17:00	8.00	6.8	2.06	No	No
10	2009OCT26	10:15	15:00	4.66	3.16	7.61	No	No
11	2009OCT27	10:30	16:30	6.00	2.26	7.66	No	No
12	2009OCT28	10:45	16:45	6.00	1.61	8.08	No	No
13	2009OCT29	10:10	16:10	6.00	2.54	7.55	No	No

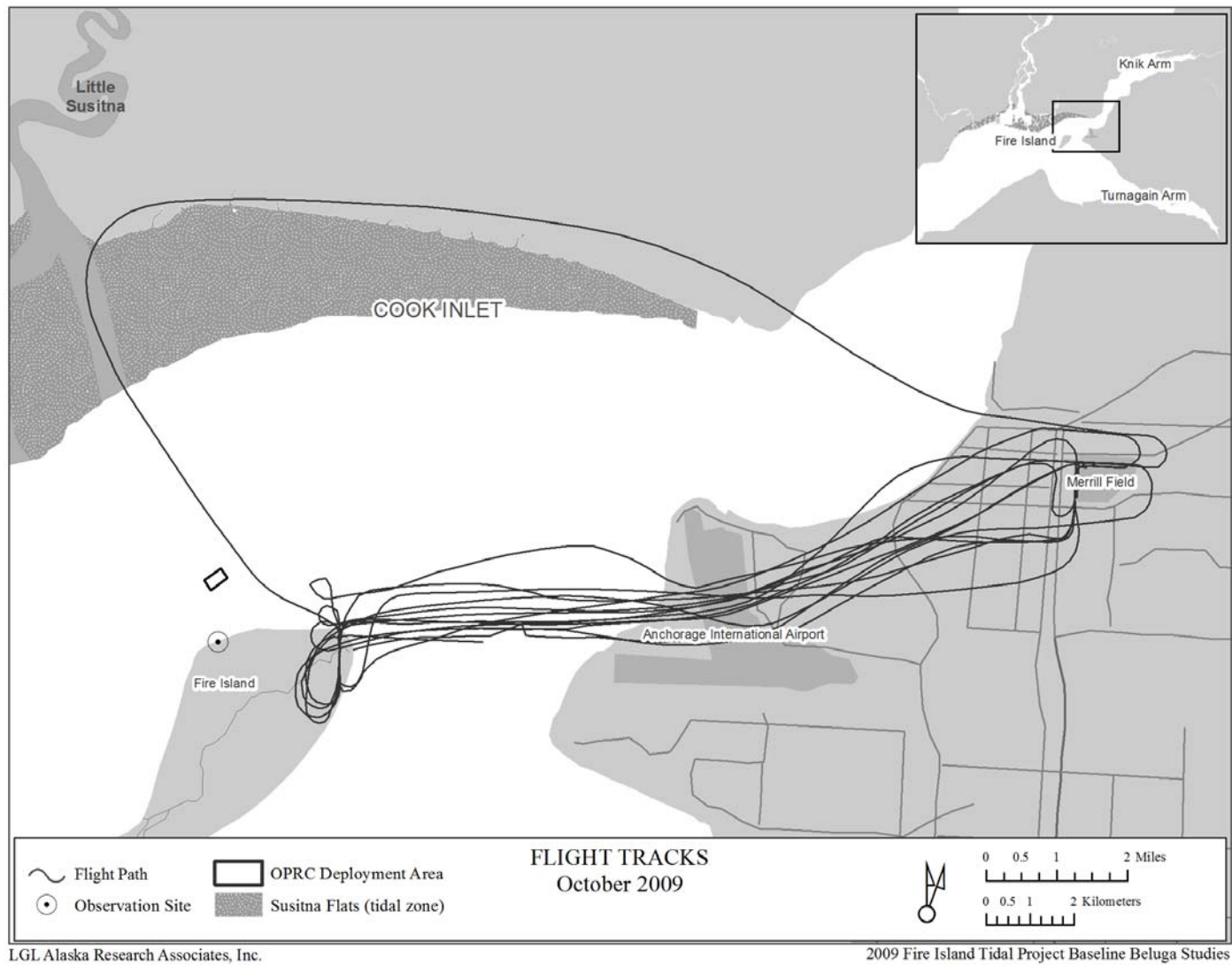


Figure 1. Paths of crew-transport flights in October 2009.

To: Mary McCann	
From: Scott Prevatte	Project: ORPC Cook Inlet Fish Survey
CC: Paul McLarnon, Don Degan, Nathan Vail	
RE: Trip Report for October 5, 2009	Event # : 10_2009

Data Collection Event: October 5, 2009

Personnel: Scott Prevatte, Erin Cunningham, Mark Savoie

Weather: Overcast, light rain, light wind from SE to 5 knots, seas variable 0-2 feet

Launch Time: 10:45 October 5, 2009

Dock Time: 23:00 October 5, 2009

Tide Prediction:

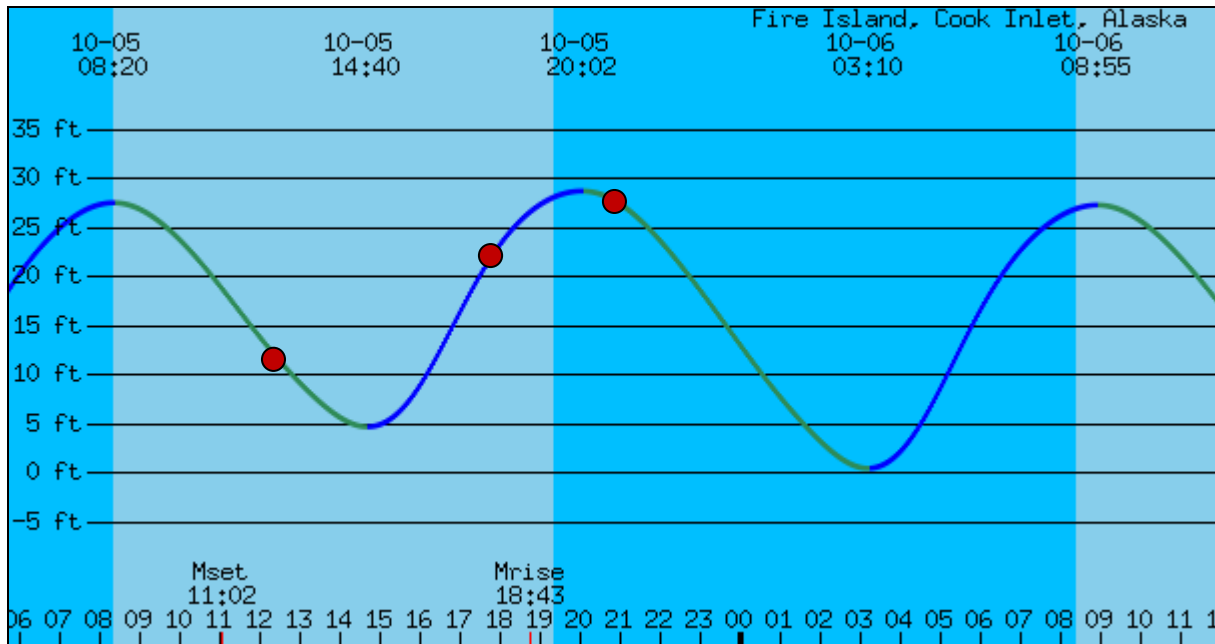
High: 08:20 October 5
 Low: 14:40 October 5
 High: 20:02 October 5
 Low: 03:10 October 6

Daylight Prediction:

Sunrise: 08:18 October 5
 Sunset: 19:18 October 5

Survey Times:

Survey 1: 11:54 to 13:01
 Survey 2: 17:26 to 18:38
 Survey 3: 20:02 to 21:10



Tide prediction and acoustic survey times for Fire Island, AK, October 5, 2009.

Data Collection:

Down looking transducer: No noise. Equipment functioned properly.

Side looking transducer: Some systematic noise. Pitch and roll due to wave action was minimal, equipment functioned properly.

Target verification: Target verification was conducted within the study area. Gill net surface drift through entire study area one times for duration of 0.5 hours. Surface trawl one time for duration of 0.75 hours.

Catch:

Gill Net #1 Surface - No catch

Trawl #1 Surface- 1 nine spine stickleback (45mm), 1 juvenile cod (80mm), 179 amphipods (15-20mm), 297 shrimp (10-60mm).

Data Upload: Completed to Aquacoustics ftp site on October 7 at 13:00.

Incidental Observations:

Marine mammals: None

Birds: None

Fish: None

Boats: One skiff heading toward Anchorage in evening.

Other: Few logs and some small woody debris. One small aircraft landed Fire Island in evening.

Narrative:

The data collection event of October 5, 2009 took place during favorable sea conditions. HDR and Kinnetic Laboratories personnel launched the RV North Forty from Ship Creek public boat launch at 10:45. The weather was overcast with light rain and light wind and seas were generally less than one foot. Acoustic survey data collection was slightly affected by boat pitch and roll during sub survey #2.

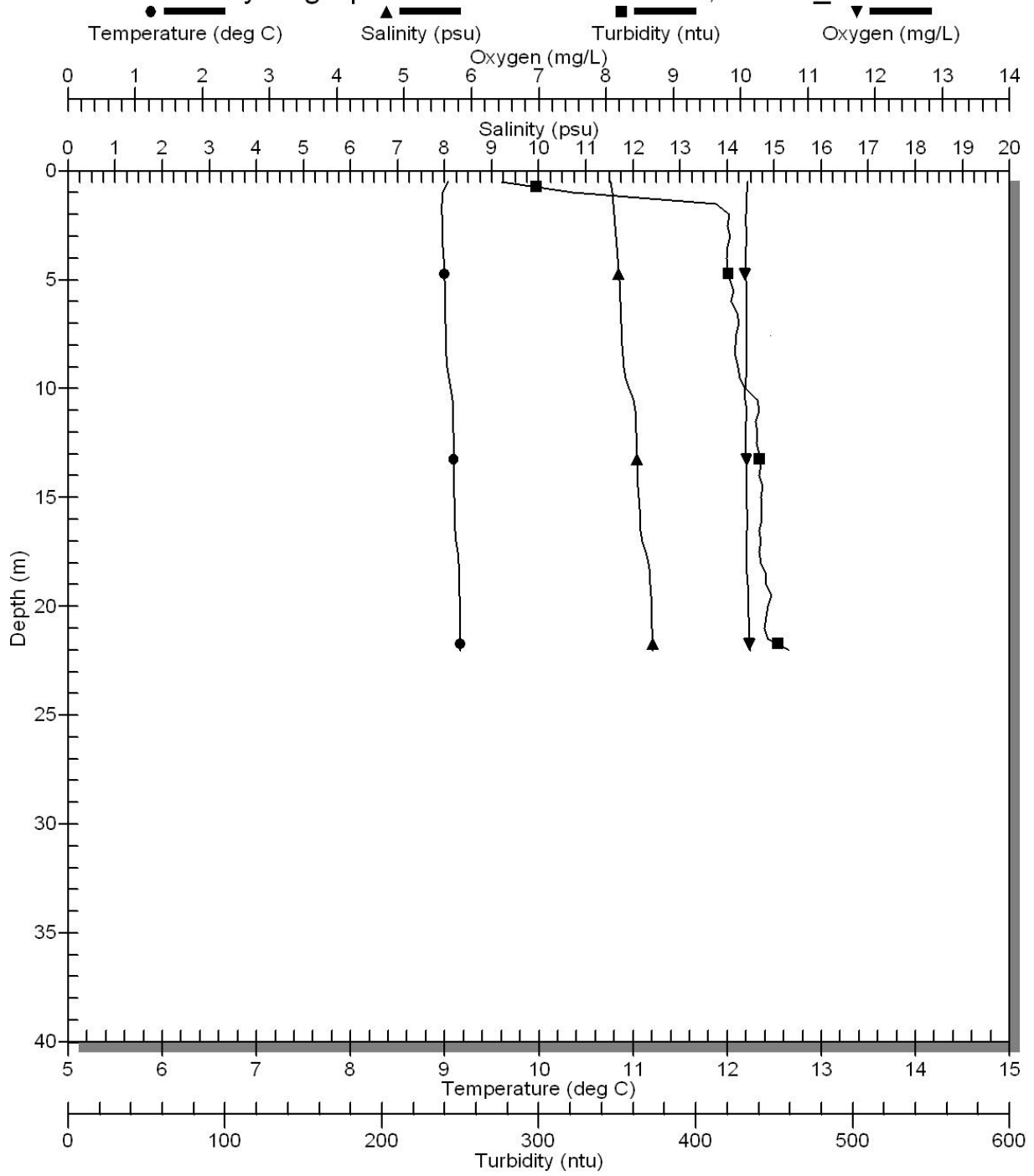
Gill net sampling was attempted once within the study area. A 100 foot long by 8 foot deep experimental mesh (1" to 5") monofilament gill net was fished on the surface and at depth. The net was controlled drift through the study area near slack low and again in the opposite direction on the flood tide. The drift lasted approximately 30 minutes. No fish were caught with this method.

Trawl net sampling was conducted at the surface once during low slack tide. A modified Isaac Kid style trawl constructed of 1/4 inch mesh with a 1/8 inch zippered cod end and measuring 8 feet by 8 feet by 25 feet with aluminum frame and tow bar was deployed at approximately 125 feet behind the boat. The tow lasted approximately 45 minutes. Even at slack tide current made forward progress and navigation difficult. Total catch was 1 nine spine stickleback at 45mm, 1 juvenile cod at 80mm, 179 amphipods ranging from 15-20mm, and 297 shrimp ranging from 10-60mm.

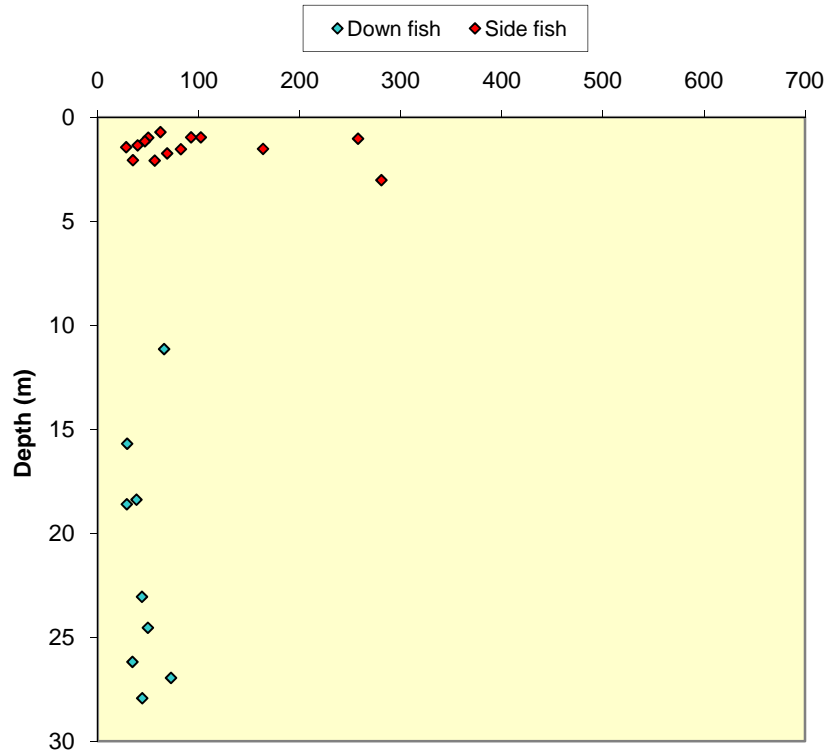
The next survey is scheduled to occur on October 13th.

Note: Ship Creek public boat launch scheduled to close for season on October 15th.

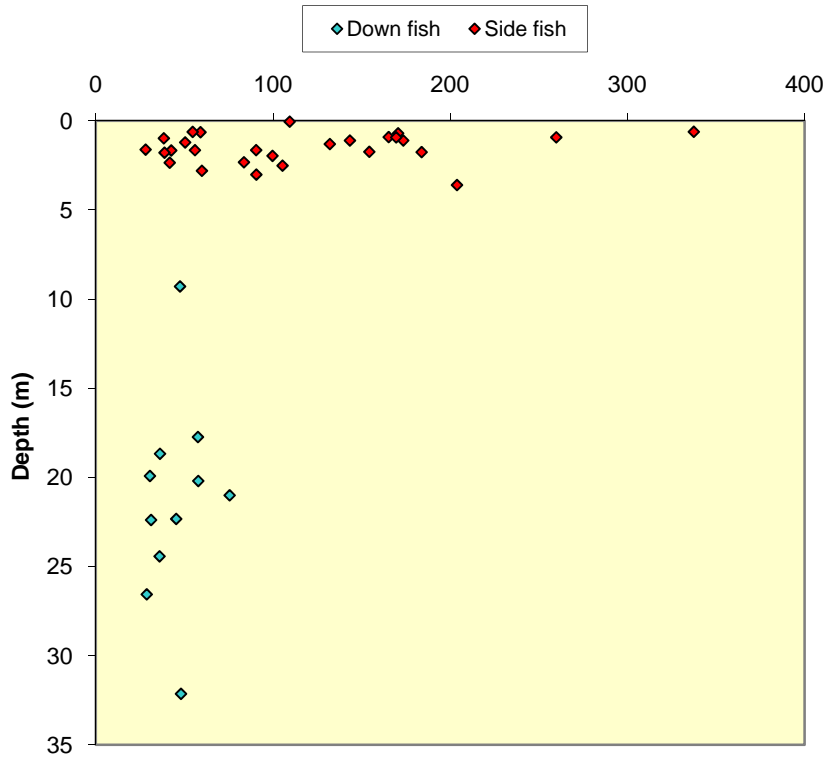
ORPC - Hydrographic Data - Summer 2009, ORPC_1005.cnv



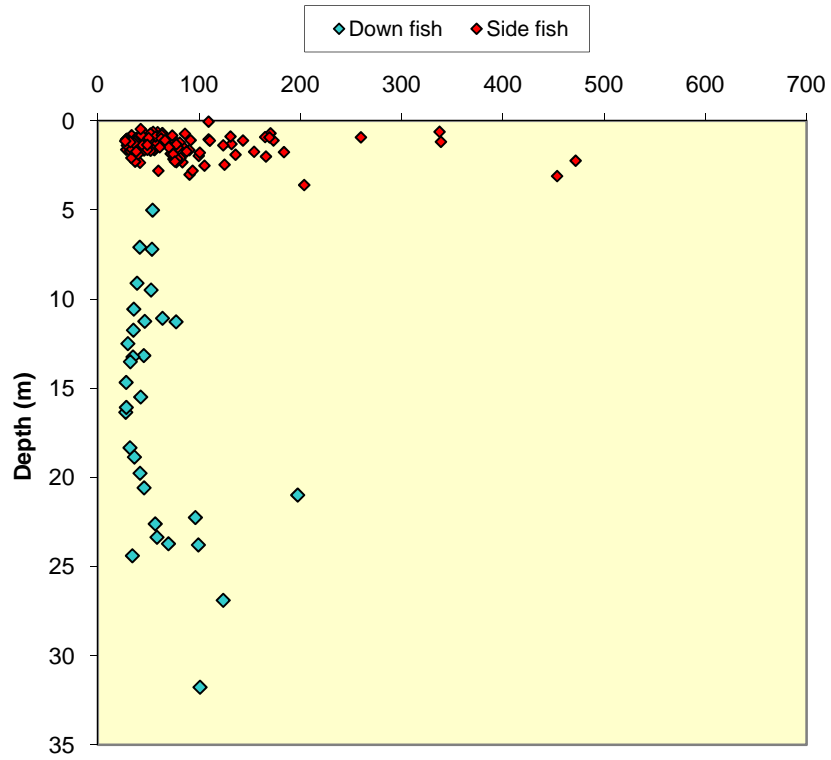
September 23, 2009 Tracked fish size (mm, by depth (m) sub-survey 1 - ebb tide



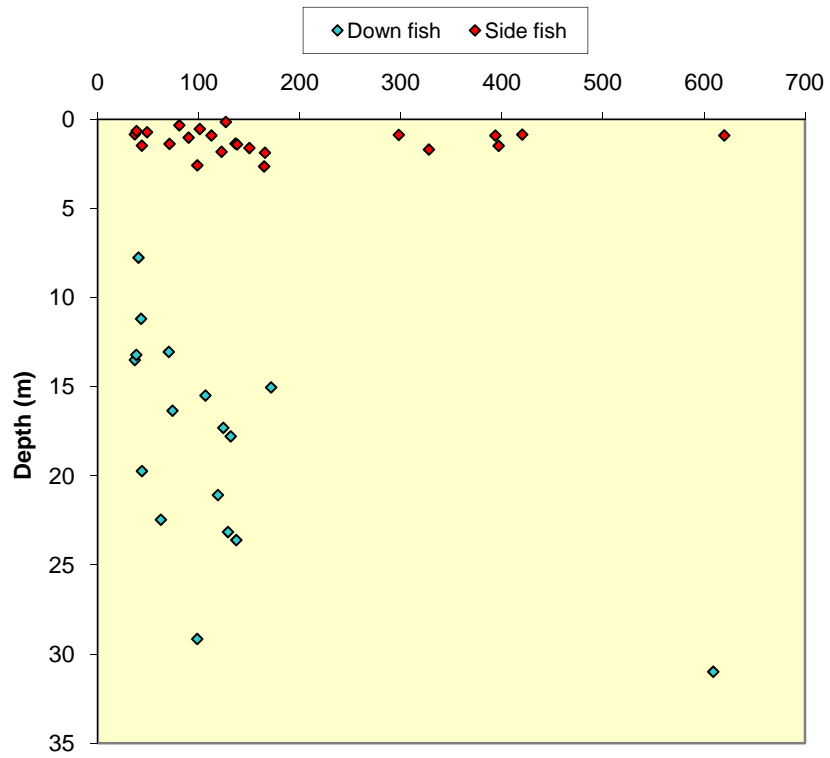
September 23, 2009 Tracked fish size (mm, by depth (m) sub-survey 2 - flood tide



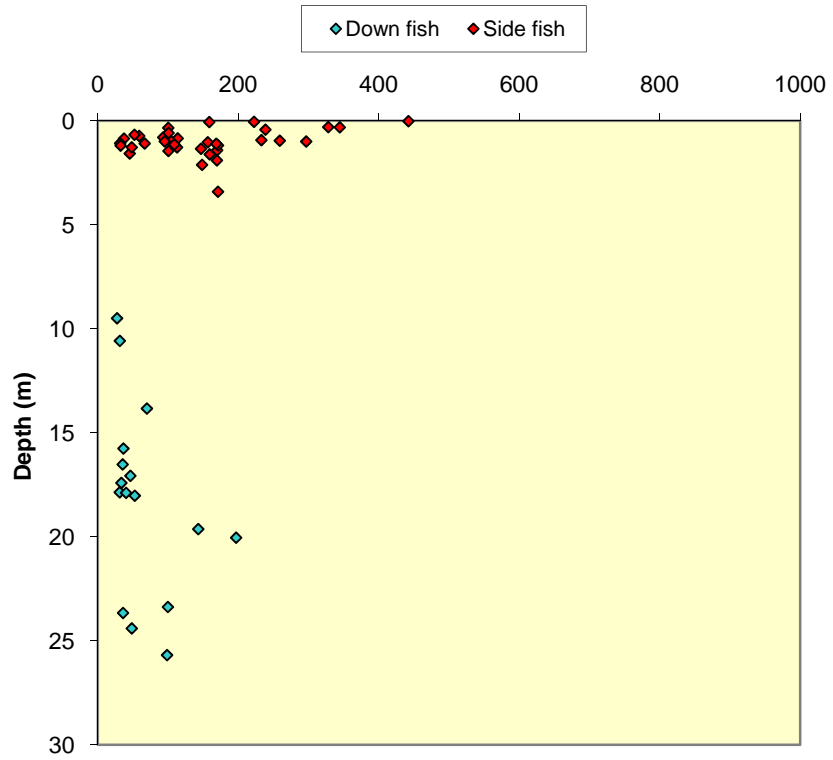
September 23, 2009 Tracked fish size (mm, by depth (m) sub-survey 3 - flood tide night



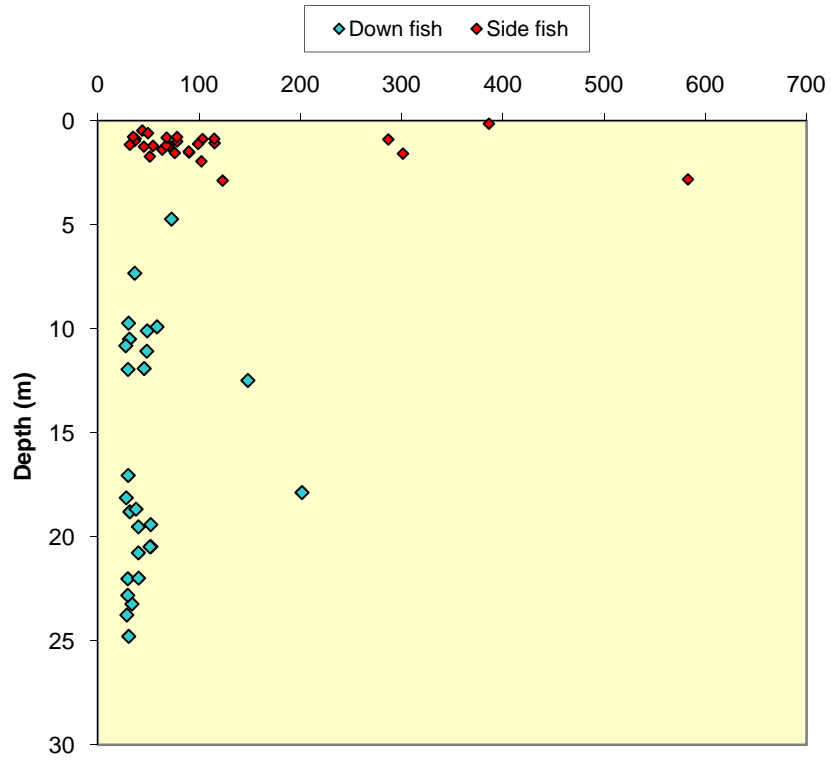
October 5, 2009 Tracked fish size (mm) by depth (m) sub-survey 1 - ebb tide



October 5, 2009 Tracked fish size (mm) by depth (m) sub-survey 2 - flood tide



October 5, 2009 Tracked fish size (mm) by depth (m) sub-survey 3 - slack tide night



Overview

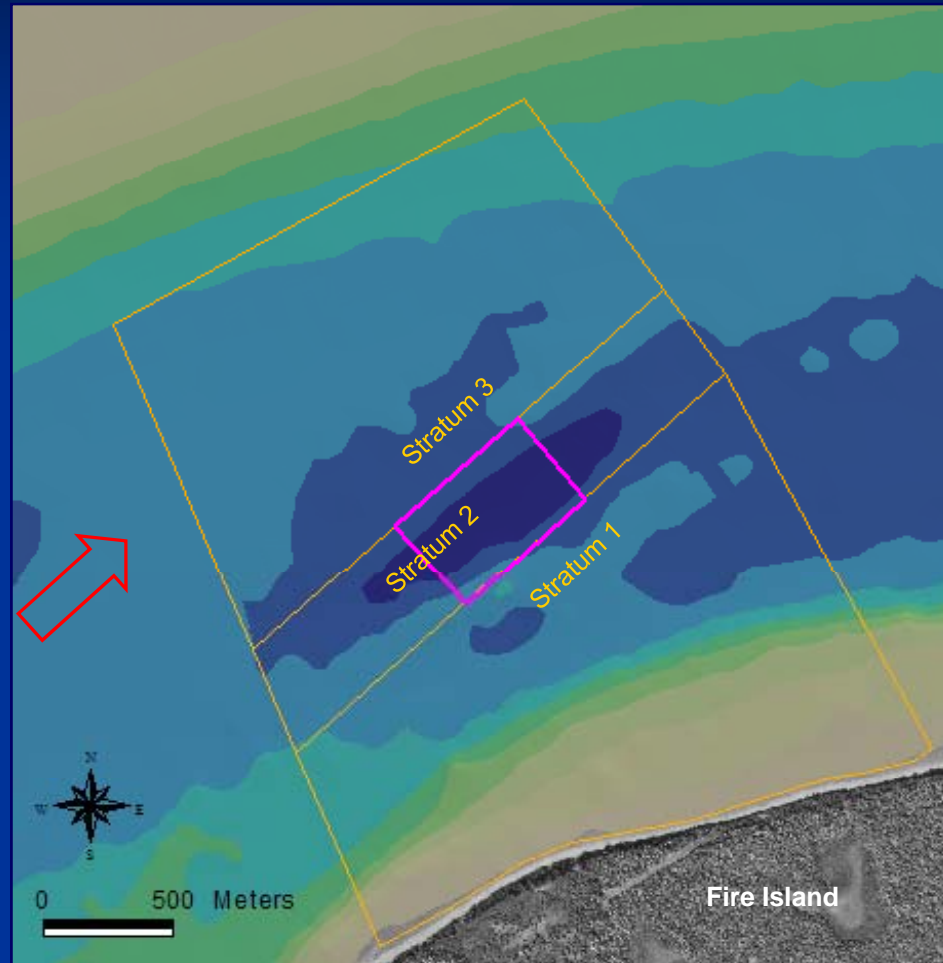
View point and direction of 3D graphics

Study area strata

Deployment area

Depth (m) at MLLW

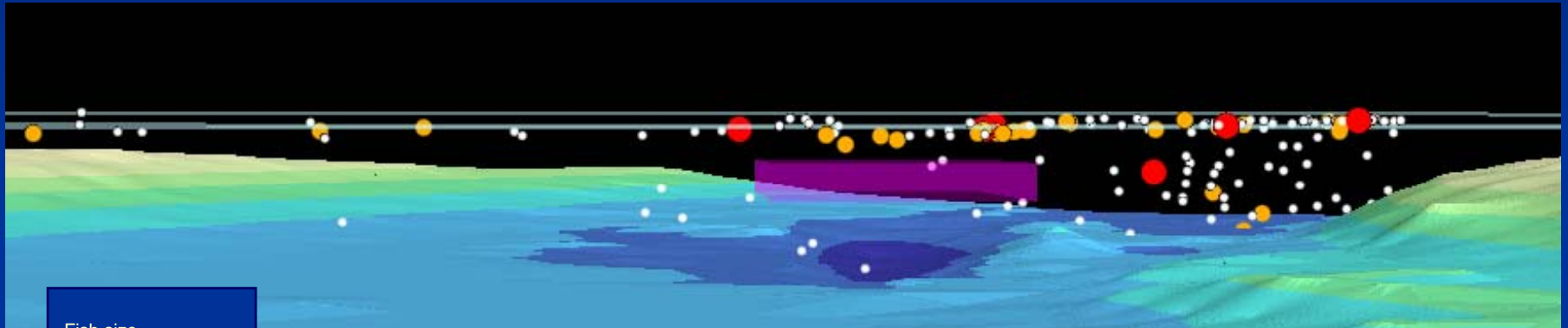
	-0.7 - 3
	-4.3 - -0.7
	-8 - -4.3
	-11.7 - -8
	-15.3 - -11.7
	-19 - -15.3
	-22.7 - -19
	-26.3 - -22.7
	-30 - -26.3



Survey 09-23-09:

fish size, vertical and cross-channel distribution

all sub-surveys combined



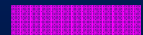
Fish size

- < 10 cm
- 10 – 30 cm
- > 30 cm

Water surface

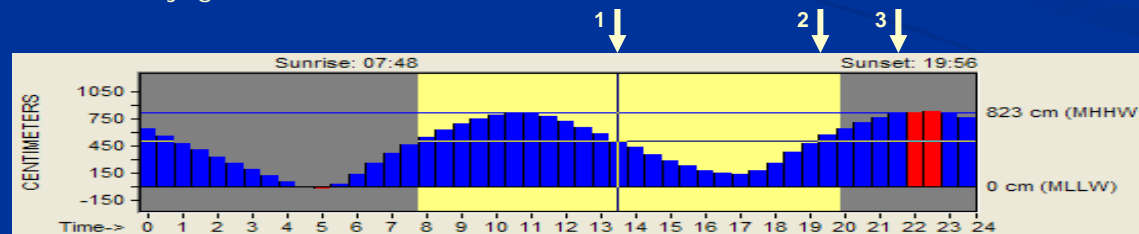


Deployment area



tide and daylight

sub-surveys

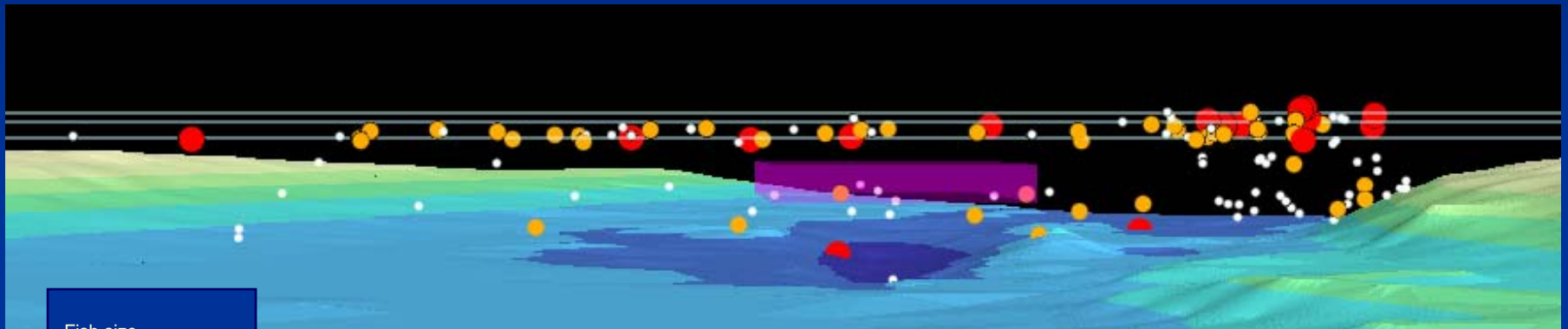


Source: NOAA predictions for Fire Island

Survey 10-05-09:

fish size, vertical and cross-channel distribution

all sub-surveys combined



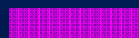
Fish size

- < 10 cm
- 10 – 30 cm
- > 30 cm

Water surface

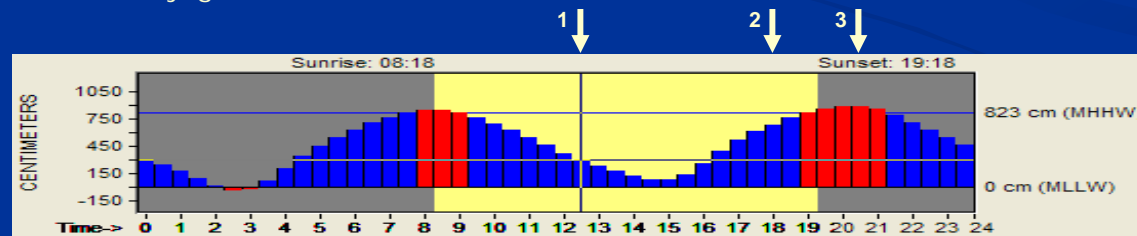


Deployment area



tide and daylight

sub-surveys



Source: NOAA predictions for Fire Island