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Southeast Alaska Coastal Monitoring (SECM) Cruise Plan for 2004

by

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Southeast Alaska Coastal Monitoring (SECM) Cruise Plan for 2004

The Southeast Coastal Monitoring (SECM) project in Alaska was initiated in 1997 by the Auke Bay Laboratory, National Marine Fisheries Service, to study the habitat use and early marine ecology of juvenile (age 0) Pacific salmon. This SECM research addresses components identified in the National Oceanic and Atmospheric Administration (NOAA) Fisheries Strategic Plan, the North Pacific Anadromous Fisheries Commission (NPAFC) 2001–2005 Science Plan, and the Gulf of Alaska Global Ocean Ecosystem Dynamics (GLOBEC) Program.

The three primary components of the NOAA Fisheries Strategic Plan are to: 1) rebuild and maintain sustainable fisheries, 2) promote the recovery of protected species, and 3) protect and maintain the health of coastal marine habitats. Our research addresses the first component by emphasizing long-term ecological monitoring of coastal marine habitats used by juvenile salmon, and researching the relationship of environmental variability to the sustainability of Pacific salmon resources. The second component is addressed by seasonal sampling, which documented the earliest occurrence off the Alaska coast of stream-type juvenile chinook salmon stocks from the Columbia River Basin; many of these stock groups are protected species. The third component is addressed by spatial and temporal sampling, which describes the essential marine habitat utilized by juvenile salmon as they migrate seaward to the Gulf of Alaska, and by documenting the occurrence of the salmon in relation to biophysical factors.

The NPAFC 2001–2005 Science Plan identifies "juvenile salmon research" as one of three major focuses of cooperative NPAFC science activities. Research issues within this juvenile salmon component include: 1) seasonal distribution and migration, 2) population size and survival estimates, 3) trophic linkages and growth changes, and 4) primary production and food resources. Our SECM research is closely aligned with these issues. The NPAFC Science Plan requires long-term ecological monitoring projects like SECM to study key juvenile salmon stocks in several regions of the North Pacific Rim and encompassing a variety of environmental conditions, to understand the relationships of habitat use, marine growth, hatchery and wild stock interactions, year-class strength, and ocean carrying capacity.

The GLOBEC research incorporates basin-scale studies to determine how plankton productivity and the carrying capacity for high-trophic level, pelagic carnivores in the North Pacific Ocean change in response to climate variations, and incorporates regional-scale ecosystem studies to compare how variations in ocean climate affect species dominance and fish populations in the coastal margins of the Pacific Rim. Our SECM research addresses the regional-scale component of the GLOBEC research.

From 1997 to 2000, SECM research was directed at sampling juvenile salmon and their associated biophysical parameters in inshore, strait, and coastal habitats along a primary seaward migration corridor in the northern region of Southeast Alaska. Up to 24 stations spanning 250 km were sampled five times annually, from May to October. These habitats extended geographically from inshore localities near large glacial rivers to 65 km offshore in the Gulf of Alaska. Fish were sampled diurnally with a NORDIC 264 surface rope trawl from the NOAA ship *John N. Cobb*. Biophysical data collected included: profile data of water temperature and salinity, surface nutrients and chlorophyll, zooplankton from vertical 20-m hauls and double oblique hauls deployed to 200 m depth, and onboard stomach analysis of potential predators of juvenile salmon.

In 2001-2003, SECM researchers continued biophysical sampling at 13 core stations and directed more research effort into process studies (Tables 1 and 2, Fig. 1). Two such studies initiated in 2001 included diel feeding periodicity and prey fields of juvenile salmon, and onboard gastric evacuation rate experiments for juvenile pink and chum salmon. These process studies will enable more accurate input parameters to be used with bioenergetic models to evaluate coastal marine carrying capacity and salmon habitat quality (growth potential). In 2002, sampling was curtailed after late August because juvenile salmon abundances are low in September; sampling time intervals were increased in earlier months to maximize the opportunities for obtaining data at offshore stations and to replicate trawling at the core stations. In 2003, sampling frequency at the 13 core stations was increased from four to six intervals, between mid-May and late-August, to gain better temporal resolution of biophysical factors related to salmon growth and abundance. Additionally, concurrent inshore sampling was added in two periods using a second trawl gear type to examine inshore spatial distribution and compare size-selectivity of the two trawl types for juvenile salmon. Sea lice infestation on juvenile salmon was also recorded.

Our SECM research in 2004 is scheduled to sample the 13 core stations at five intervals, from late May to late August, with a research focus similar to 2001–2003. An additional focus in 2004 will be to collaborate with a planned Southeast Sustainable Salmon Fund (SSSF) study to examine hatchery- and wild-stock interactions of juvenile chum salmon in the Taku River estuary. For the field component of the SSSF study, sampling of littoral habitats will begin in 2004, while SECM researchers will conduct additional complementary sampling in neritic habitats.

Table 1.—Localities and coordinates of stations sampled monthly in marine waters of the northern region of southeastern Alaska, May–August 2004.

Locality	Station	Latitude	Longitude	Offshore distance (km)	Bottom depth (m)
Auke Bay Monitor	ABM	58°22.00′N	134°40.00′W	1.5	60
Upper Chatham Strait	UCA	58°04.57′N	135°00.08′W	3.2	400
Upper Chatham Strait	UCB	58°06.22′N	135°00.91′W	6.4	100
Upper Chatham Strait	UCC	58°07.95′N	135°04.00′W	6.4	100
Upper Chatham Strait	UCD	58°09.64′N	135°02.52′W	3.2	200
Icy Strait	ISA	58°13.25′N	135°31.76′W	3.2	128
Icy Strait	ISB	58°14.22′N	135°29.26′W	6.4	200
Icy Strait	ISC	58°15.28′N	135°26.65′W	6.4	200
Icy Strait	ISD	58°16.38′N	135°23.98′W	3.2	234
Icy Point	IPA	58°20.12′N	137°07.16′W	6.9	160
Icy Point	IPB	58°12.71′N	137°16.96′W	23.4	130
Icy Point	IPC	58°05.28′N	137°26.75′W	40.2	150
Icy Point	IPD	57°53.50′N	137°42.60′W	65.0	1300

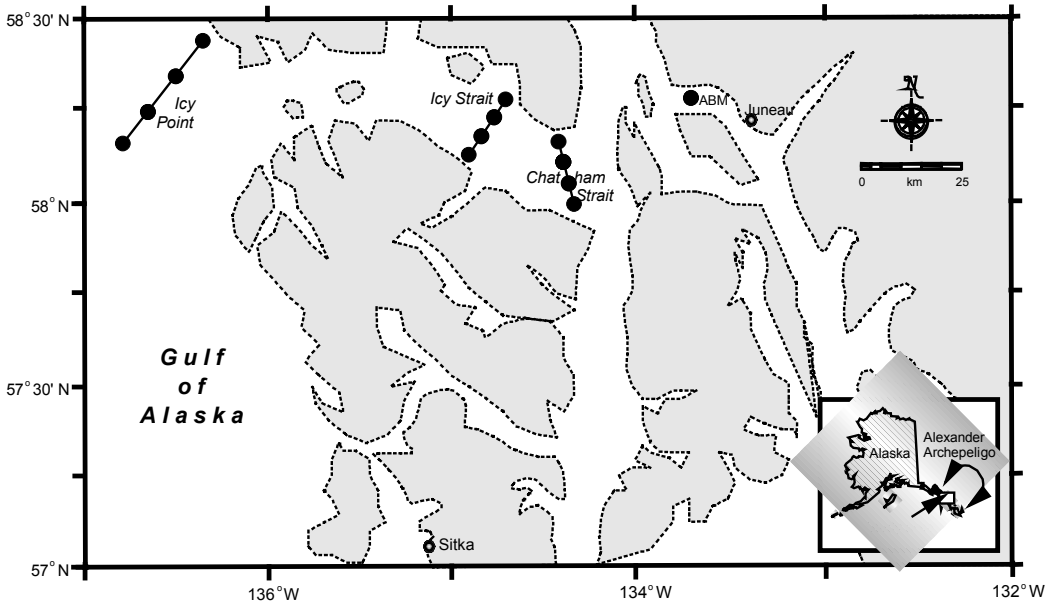

Figure 1.—Stations sampled monthly in marine waters of the northern region of southeastern Alaska, May–August 2004.

Table 2.—Southeast Alaska Coastal Monitoring (SECM) research cruises scheduled off southeastern Alaska, May–August 2004.

Vessel cruise #	Period (days)	Research focus	Sampling conducted
John N. Cobb JC-04-06	18–25 May (8 d)	Oceanography Taku Inlet collaboration	CTD, Chlorophyll and Nutrients, Zooplankton
John N. Cobb JC-04-08	20–28 June (9 d)	Oceanography Fish survey (trawl) Inshore gear comparison Taku Inlet collaboration Day/night sampling-one station (ISC)	CTD, Chlorophyll and Nutrients, Zooplankton, Fish
John N. Cobb JC-04-11	23–31 July (9 d)	Oceanography Fish survey (trawl) Inshore gear comparison Taku Inlet collaboration Day/night sampling-one station (ISC)	CTD, Chlorophyll and Nutrients, Zooplankton, Fish
John N. Cobb JC-04-12	08–11 August (4 d)	Oceanography Fish survey (trawl)	CTD, Chlorophyll and Nutrients, Zooplankton, Fish
John N. Cobb JC-04-14	21–28 August (8 d)	Oceanography Fish survey (trawl) Day/night sampling-one station (ISC)	CTD, Chlorophyll and, Nutrients Zooplankton, Fish

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