Factors Affecting the Distribution of Juvenile Salmon in the Gulf of Alaska

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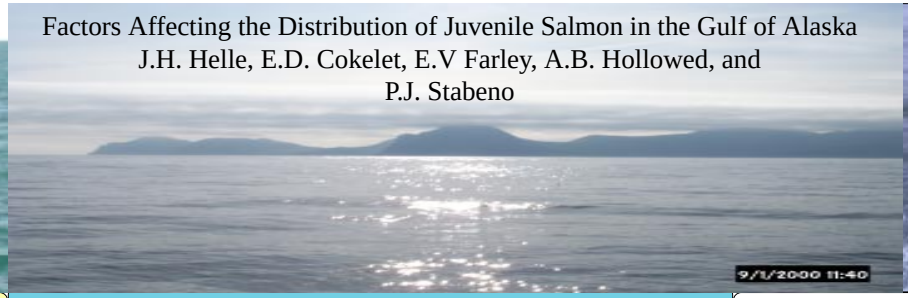
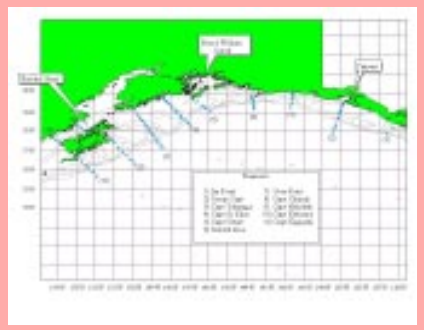


During July and August 2001, the Ocean Carrying Capacity (OCC) program collaborated with oceanographers from the Pacific Marine Environmental Laboratory and other GLOBEC investigators in a new interdisciplinary focus on the relationships between biological and physical oceanographic processes and juvenile salmon distribution in the coastal Gulf of Alaska (GOA). Our objective is to identify specific processes or factors that may be influencing juvenile salmon spatial distribution, migration, growth, condition, and survival in the GOA and their utilization of Shelikof Strait as a primary migration corridor. This poster summarizes the activities performed and the juvenile salmon distribution during the July and August 2001 juvenile salmon survey.

Contracted fishing vessel (F/V) Great Pacific (38 m) used during the Ocean Carrying Capacity/GLOBEC 2001 Gulf of Alaska juvenile salmon survey.



Transects sampled by the NMFS OCC/GLOBEC juvenile salmon survey in the Gulf of Alaska, July and August 2001.

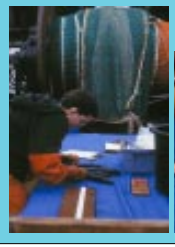
Biological Samples

Salmon and other nekton were collected using a rope trawl configured to fish near-surface waters.

Surface trawls were 30 minutes in length. After the tow was completed the net was brought aboard and the codend contents dumped onto a sorting table.

Salmon and other marine species were sorted by species and life history stage.

Length, weight, and a scale (from the preferred area) were collected from subsamples of salmon. Samples were then frozen for laboratory analyses.



Oceanographic Measurements

Biological

Zooplankton were collected at each station using a Tucker trawl with 505 mesh net.

The Tucker trawl was towed near-surface for 5-minutes.

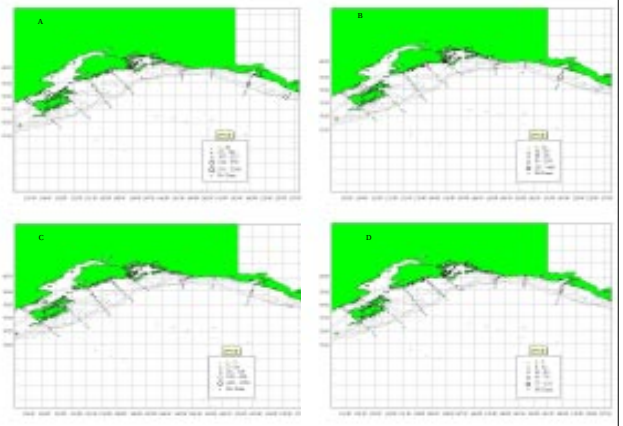
Samples were preserved in 5% formalin solution.

Physical

CTD casts to measure conductivity and temperature at depth were made at each station (max 200-m depth). Water samples were collected using a Niskin bottle.

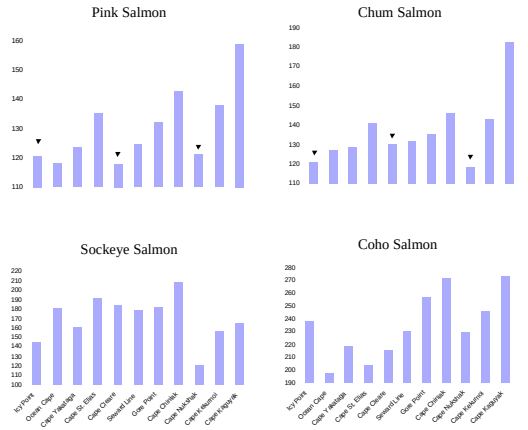
12 drifter buoys were released to document surface current. Continuous measurements of current were collected using an Acoustic Doppler Current Profiler. Surface temperature and salinity were continuously measured using a thermosalinograph.

Juvenile Salmon Distribution



Catch Per Unit Effort (CPUE) for juvenile pink (A), chum (B), sockeye (C), and coho (D) salmon.

Juvenile Salmon Average Length (mm) by Transect



Juvenile pink and chum salmon were generally smallest along transects (indicated with an arrow) adjacent to exit corridors where juvenile salmon enter the Gulf of Alaska from Southeast Alaska (Icy Point), Prince William Sound (Cape Cleare), and Cook Inlet-Kodiak Island (Cape Nukshak).

Work in Progress: Juvenile salmon are currently being processed at Auke Bay Laboratory.
We plan to:

- Determine stock composition using otolith hatchery thermal marks and allozymes.
- Conduct diet studies of juvenile salmon for comparisons with prey availability and for input into bioenergetic models of growth potential and consumption.
- Determine condition factor for juvenile hatchery salmon stocks from Southeast Alaska and Prince William Sound.
- Relate juvenile salmon distribution to oceanographic characteristics.