

TECHNICAL SUBCOMMITTEE OF THE CANADA-U.S. GROUND FISH COMMITTEE

GROUND FISH TRAWL AND LONGLINE SURVEY WORKSHOP

ALASKA FISHERIES SCIENCE CENTER, SEATTLE, WA

MARCH 22-24, 2011

SURVEYS SUMMARIES

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1. INTRODUCTION

This document collates all the survey summaries provided by workshop participants. For each survey we include the summary template and a figure indicating the survey area. Some figures were taken from the workshop presentations and some liberties were taken with the submitted templates to maintain a consistent style throughout this document.

1.1. ABBREVIATIONS AND AGENCIES

DFO = Fisheries and Oceans, Canada

MEAD = Marine Ecosystems and Aquaculture Division, Science Branch

NOAA = Department of Commerce, National Oceanic and Atmospheric Administration, USA

NMFS = National Marine Fisheries Service

NWFSC = Northwest Fisheries Science Center

AFSC = Alaska Fisheries Science Center

SWFSC = Southwest Fisheries Science Center

NEFSC = Northeast Fisheries Science Center

ASMFC = Atlantic States Marine Fisheries Commission

ADFG = Alaska Department of Fish and Game

IPHC = International Pacific Halibut Commission

MDMR = Maine Department of Marine Resources

1.2. WEBSITE

http://www.psmfc.org/tsc2/Trawl_and_Setline_Survey_Workshop_2011.html

2. NOAA, NMFS, ALASKA REGION

2.1. EASTERN BERING SEA SHELF BOTTOM TRAWL SURVEY OF GROUND FISH AND INVERTEBRATE RESOURCES

2.1.1. Presentation: AFSC_Eastern_Bering_Shelf.ppt

2.1.2. Summary

Person completing the template

- Gerald R. Hoff, 206-526-4580, jerry.hoff@noaa.gov

General location

- eastern Bering Sea continental shelf

Depth range

- 20-200 m

Year survey initiated

- 1982 (nominally 1972)

Years conducted

- 1982-2010 consistently

Planned frequency

- annual

Time of year conducted

- late May to early August

Government or charter vessel

- chartered commercial vessels

Agency responsible

- NOAA/ NMFS/ AFSC

Current project leader

- Robert Lauth, 206-526-4121, bob.lauth@noaa.gov

Contact person for data and/or results

- Robert Lauth, 206-526-4121, bob.lauth@noaa.gov

Principal sampling gear

- bottom trawl 83-112 Eastern Trawl

Number of stations/sets/tows

- 415

Principal data collected from above

- catches sorted to fish and invertebrates species, weight and numbers
- selected specimens sampled for length, sex, weight, otoliths, stomachs

Statistical design

- fixed station grid

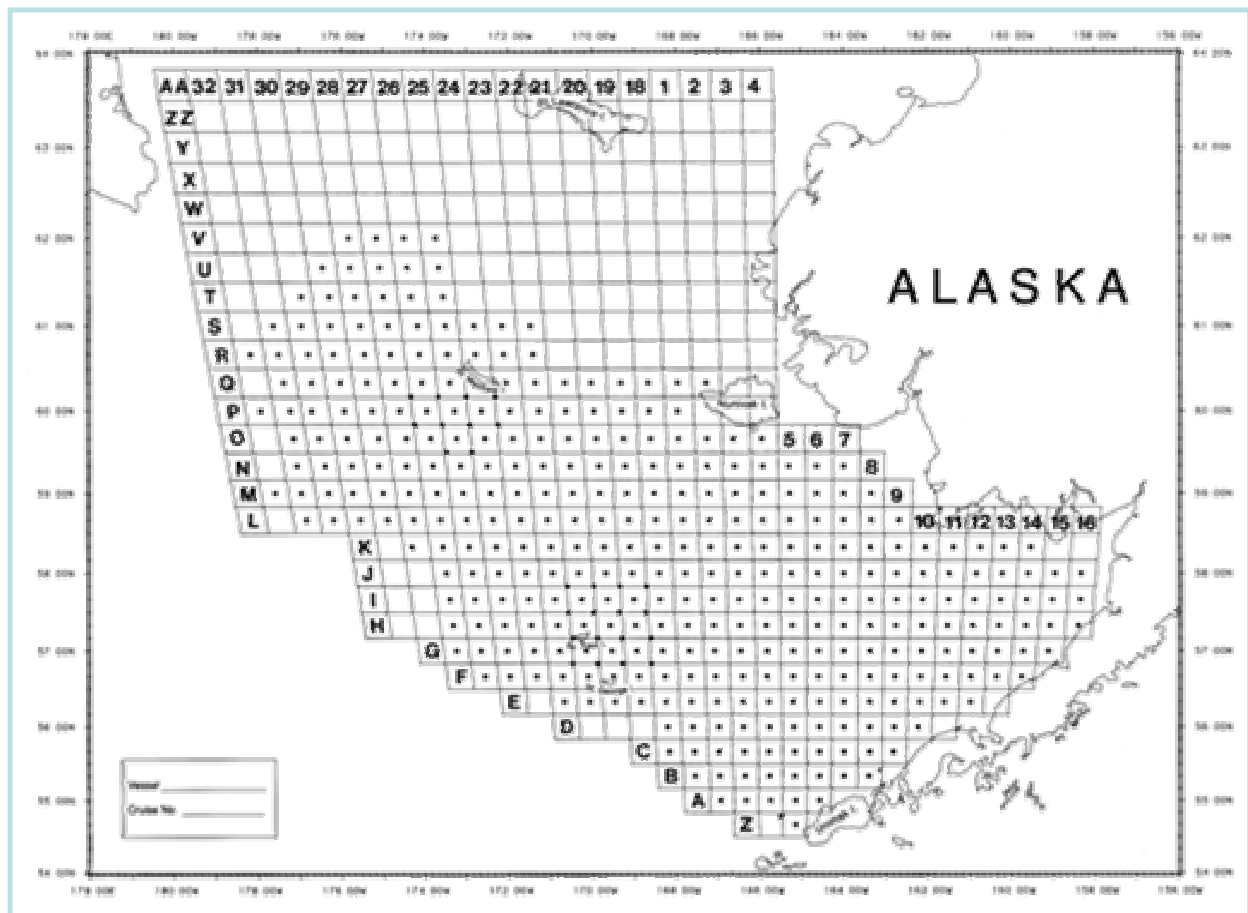
Other gear or sampling methods used in survey

- marine mammal and bird sightings (opportunisticly inconsistently)
- routine capture of acoustic backscatter data (recent years only)

Oceanographic data collected

- surface temp, water column temperature, near bottom temperature, depth, light irradiance

2.1.3. Figure



2.2. EASTERN BERING SEA UPPER CONTINENTAL SLOPE BOTTOM TRAWL SURVEY OF GROUND FISH AND INVERTEBRATE RESOURCES

2.2.1. Presentation: AFSC_Eastern_Bering_Slope.ppt

2.2.2. Summary

Person completing the template

- Gerald R. Hoff, 206-526-4580, jerry.hoff@noaa.gov

General location

- eastern Bering Sea upper continental slope

Depth range

- 200-1200 m

Year survey initiated

- 2000 (nominally 1976)

Years conducted

- 2000, 2002, 2004, 2008, 2010

Planned frequency

- biennial

Time of year conducted

- late May to early August

Government or charter vessel

- chartered commercial vessels

Agency responsible

- NOAA/ NMFS/ AFSC

Current project leader

- Gerald R. Hoff, 206-526-4580, jerry.hoff@noaa.gov

Contact person for data and/or results

- Gerald R. Hoff, 206-526-4580, jerry.hoff@noaa.gov

Principal sampling gear

- poly Nor' eastern bottom trawl net

Number of stations/sets/tows

- 200-210

Principal data collected from above

- catches sorted to fish and invertebrates species, weight and numbers
- selected specimens sampled for length, sex, weight, otoliths, stomachs

Statistical design

- random stratified by depth and area

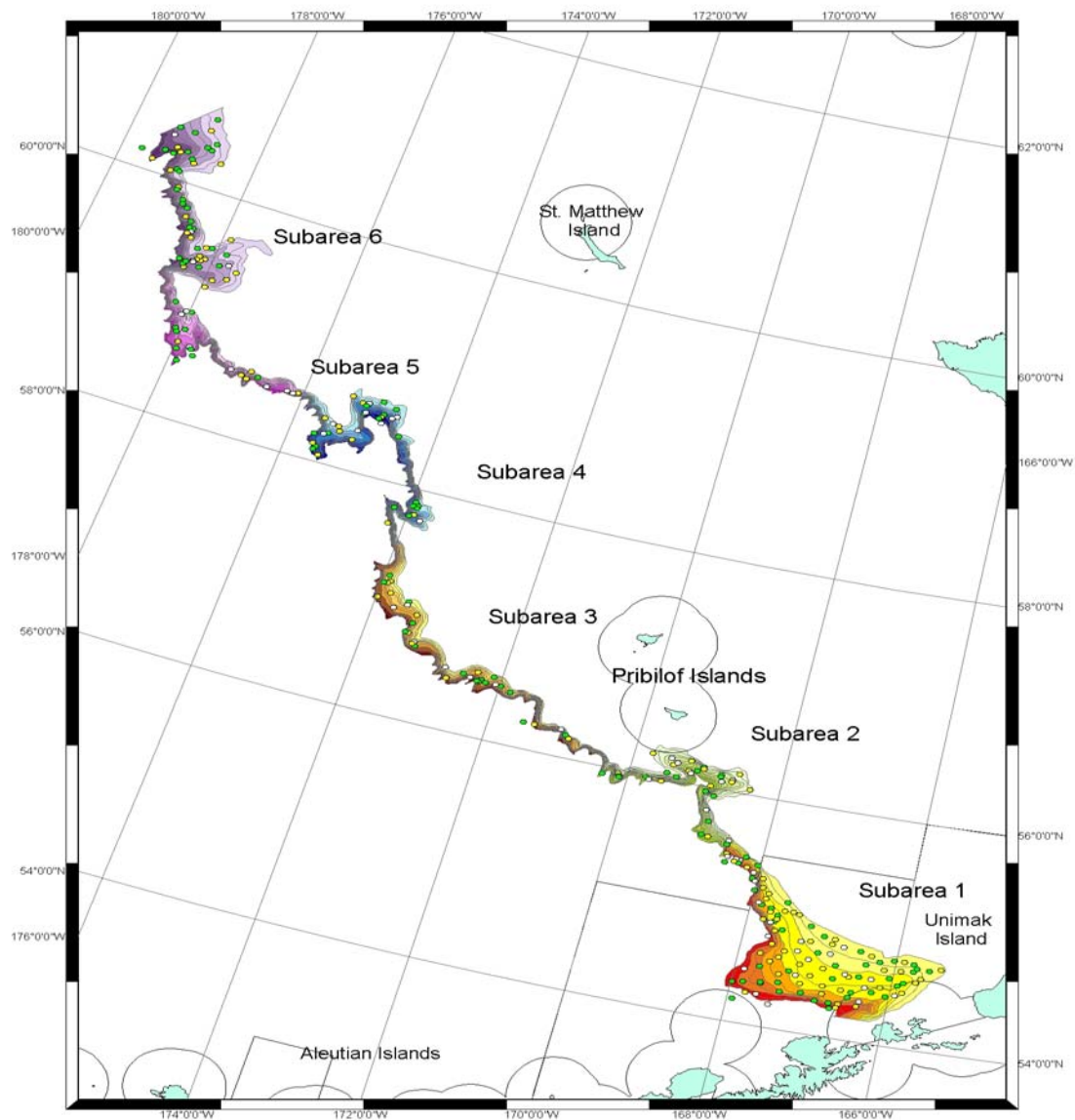
Other gear or sampling methods used in survey

- marine mammal and bird sightings (opportunisticly inconsistently)
- routine capture of acoustic backscatter data (recent years only)

Oceanographic data collected

- surface temperature, water column temperature, near bottom temperature, depth, light irradiance

2.2.3. Figure



2.3. BIENNIAL BOTTOM TRAWL SURVEY OF GROUND FISH AND INVERTEBRATE RESOURCES OF THE CONTINENTAL SHELF OF THE ALEUTIAN ISLANDS

2.3.1. Presentation: AFSC_Aleutian_Gulf_Shelf.ppt

2.3.2. Summary

Person completing the template

- Mark Wilkins, 206-526-4104, Mark.Wilkins@noaa.gov

General location

- Waters north of the Aleutian Islands from Unimak Pass (165° W longitude) to Stalemate Bank (170° E longitude) and waters south of the archipelago from the Islands of Four Mountains (170° W longitude) to Stalemate Bank

Depth range

- 20-500 m

Year survey initiated

- 1980

Years conducted

- 1980, 1983, 1986, 1991, 1994, 1997, 2000, 2002, 2004, 2006, 2010

Planned frequency

- triennial (or nearly) 1980 – 2000
- biennial (even years) since 2000 (except 2008)

Time of year conducted

- summer, 70 days, usually late May/early June to early August

Government or charter vessel

- two chartered commercial trawlers work concurrently

Agency responsible

- NOAA/ NMFS/ AFSC
 - Resource Assessment and Conservation Engineering (RACE) Division
 - Groundfish Assessment Program
 - Gulf of Alaska/Aleutian Islands Team

Current project leader

- Mark Wilkins, 206-526-4104, Mark.Wilkins@noaa.gov
- After June 2011, Wayne Palsson, 206-526-4104, Wayne.Palsson@noaa.gov

Contact person for data and/or results

- through June 2011: Mark Wilkins, 206-526-4104, Mark.Wilkins@noaa.gov
- thereafter: Paul von Szalay, 206-526-4153, Paul.von.Szalay@noaa.gov or Michael Martin, 206-526-4175, Michael.Martin@noaa.gov

Principal sampling gear

- standardized RACE Division Nor'Eastern high-rise (4-seam) bottom trawl with bobbin roller gear footrope (Stauffer, 2004 Appendix 1, Protocol 4)

Number of stations/sets/tows

- 420

Principal data collected from above

- effort (area covered by trawl haul) and trawl performance (speed over bottom, continuity of bottom contact, net damage, etc)
- catch of fish and invertebrates sorted to species, when possible. Protocols include
 - Minimum identification requirements list that establishes the baseline level of identification expected from all survey teams, and
 - Presence/absence list designating organisms that should always be identified when present (so we know definitively whether an organism was or was not caught)
- size frequency measurements
- age structures (otoliths, vertebrae)
- stomach contents for trophic studies

Statistical design

- stratified random, 45 geoFigure/depth/habitat strata

Other gear or sampling methods used in survey

- benthic bag (very-near-bottom, small-mesh sampler) below footrope (qualitative sampling for presence of various benthic taxa, tiny critters, etc)
- marine mammal watch maintained to avoid takes
- acoustic backscatter from ES-60 sounders recorded continually for multiple uses (bottom profiling, rockfish relative abundance, etc). Sounders have been calibrated in most recent years
- bird sightings (usually opportunistic, designed into protocol some years)

Oceanographic data collected

- surface temperature and water column temperature/depth profile collected with SeaBird data logger mounted on headrope of trawl
- wind, sea state, current conditions noted by skipper and/or FPC

Key citations for methodology

Von Szalay, P. G., C.N. Rooper, N.W. Raring, and M.H. Martin. 2011. Data Report 2010 Aleutian Islands bottom trawl survey. U.S. Dep. Commer., NOAA Tech. Memo. NMFS-AFSC-215, 153 p, <http://www.afsc.noaa.gov/Publications/AFSC-TM/NOAA-TM-AFSC-215.pdf>

Stauffer, Gary (compiler). 2004. NOAA Protocols for Groundfish Bottom Trawl Surveys of the Nation's Fishery Resources. U.S. Dep. Commerce, NOAA Tech. Memo. NMFS-F/SPO-65, 205 p. <http://spo.nmfs.noaa.gov/tm/tm65.pdf>

2.3.3. Figure

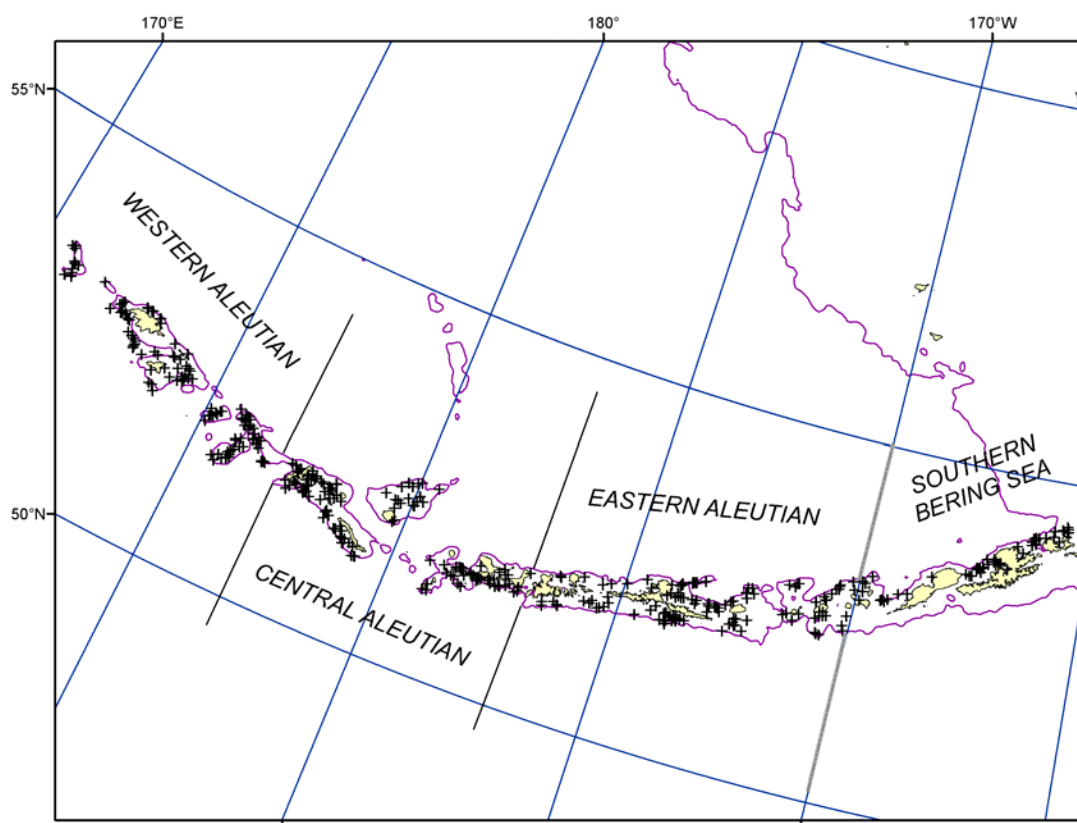


Figure 1.--Locations of successful tows made during the 2010 Bottom Trawl Survey of Groundfish and Invertebrate Resources in the Aleutian Islands Region. Management subareas and the 500 m depth contour are shown.

2.4. BIENNIAL BOTTOM TRAWL SURVEY OF GROUNDFISH AND INVERTEBRATE RESOURCES OF THE CONTINENTAL SHELF AND SLOPE IN THE GULF OF ALASKA

2.4.1. Presentation: AFSC_Aleutian_Gulf_Shelf.ppt

2.4.2. Summary

Person completing the template

- Mark Wilkins, 206-526-4104, Mark.Wilkins@noaa.gov

General location

- Gulf of Alaska, 170° W longitude (Islands of Four Mountains) to Dixon Entrance (British Columbia border)

Depth range

- 20-1,000 m

Year survey initiated

- survey developed and adjusted in 1978 and 1981
- accepted years of standard time series
- 1984-present

Years conducted

- pilot & preliminary
- 1978 & 1981
- time series
- 1984, 1987, 1990, 1993, 1996, 1999, 2001, 2003, 2005, 2007, 2009, 2011 planned

Planned frequency

- biennial (odd years)
- initially conducted triennially 1984-1999, changed to biennial schedule as of 1999

Time of year conducted

- summer, 75 days, as early as mid-May to as late as mid-August

Government or charter vessel

- three chartered commercial trawlers work concurrently during fully-funded surveys

Agency responsible

- NOAA/ NMFS/ AFSC
 - Resource Assessment and Conservation Engineering (RACE) Division
 - Groundfish Assessment Program
 - Gulf of Alaska/Aleutian Islands Team

Current project leader

- Mark Wilkins, 206-526-4104, Mark.Wilkins@noaa.gov

Contact person for data and/or results

- through June 2011: Mark Wilkins, 206-526-4104, Mark.Wilkins@noaa.gov
- thereafter: Paul von Szalay, 206-526-4153, Paul.von.Szalay@noaa.gov or Michael Martin, 206-526-4175, Michael.Martin@noaa.gov

Principal sampling gear

- standardized RACE Division Nor'Eastern high-rise (4-seam) bottom trawl with bobbin roller gear footrope (Stauffer, 2004 Appendix 1, Protocol 4)

Number of stations/sets/tows

- 825

Principal data collected from above

- effort (area covered by trawl haul) and trawl performance (speed over bottom, continuity of bottom contact, net damage, etc)
- catch of fish and invertebrates sorted to species, when possible. Protocols include
 - Minimum identification requirements list that establishes the baseline level of identification expected from all survey teams, and
 - Presence/absence list designating organisms that should always be identified when present (so we know definitively whether an organism was or was not caught)
- size frequency measurements
- age structures (otoliths, vertebrae)
- stomach contents for trophic studies

Statistical design

- stratified random, 59 geoFigure/depth/habitat strata

Other gear or sampling methods used in survey

- benthic bag (very-near-bottom, small-mesh sampler) below footrope (qualitative sampling for presence of various benthic taxa, tiny critters, etc)
- marine mammal watch maintained to avoid takes
- acoustic backscatter from ES-60 sounders recorded continually for multiple uses (bottom profiling, rockfish relative abundance, etc). Sounders have been calibrated in most recent years
- bird sightings (usually opportunistic, designed into protocol some years)

Oceanographic data collected

- surface temperature and water column temperature/depth profile collected with SeaBird data logger mounted on headrope of trawl
- wind, sea state, current conditions noted by skipper and/or FPC

Key citations for methodology

von Szalay, P. G., N. W. Raring, F. R. Shaw, M. E. Wilkins, and M. H. Martin. 2010. Data Report: 2009 Gulf of Alaska bottom trawl survey. U.S. Dep. Commer., NOAA Tech. Memo. NMFS-AFSC-208, 245 p. <http://www.afsc.noaa.gov/Publications/AFSC-TM/NOAA-TM-AFSC-208.pdf>

Stauffer, Gary (compiler). 2004. NOAA Protocols for Groundfish Bottom Trawl Surveys of the Nation's Fishery Resources. U.S. Dep. Commerce, NOAA Tech. Memo. NMFS-F/SPO-65, 205 p. <http://spo.nmfs.noaa.gov/tm/tm65.pdf>

2.4.3. Figure

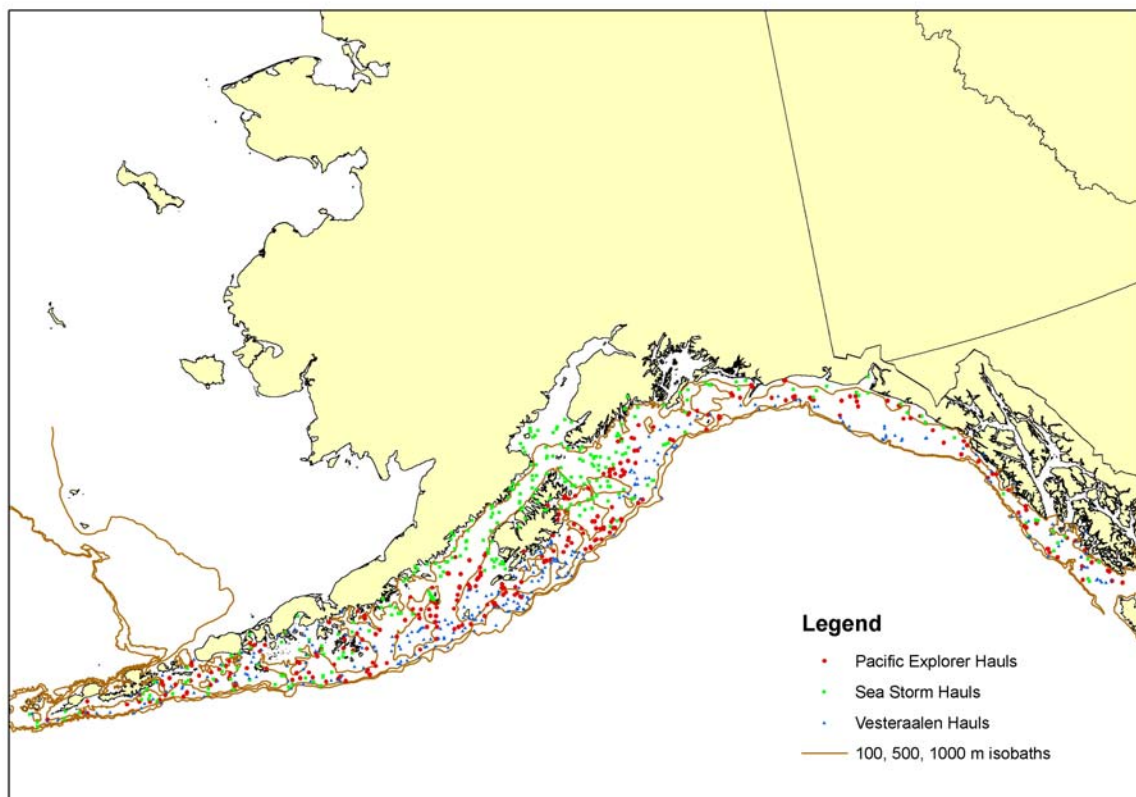


Figure 1.-- Locations of the 823 stations successfully sampled during the 2009 Biennial Gulf of Alaska Bottom Trawl Survey. Depths of successful tows ranged from 21 to 986 m. The 100, 500, and 1,000 m isobaths are shown.

2.5. AFSC LONGLINE SURVEY

2.5.1. Presentation: AFSC_Auke_Bay_Surveys.ppt

2.5.2. Summary

Person completing the template

- Chris Lunsford, 907-789-6008, chris.lunsford@noaa.gov

General location

- Alaska

Depth range

- 150-1000m

Year survey initiated

- Japan-U.S. cooperative survey 1979
- US survey 1988

Years conducted

- Japan-U.S. cooperative survey – 1979-1994
- U.S. survey 1987-present

Planned frequency

- annual in Gulf of Alaska
- biennial in Aleutians and Bering Sea

Time of year conducted

- May to August

Government or charter vessel

- charter – freezer longliner

Agency responsible

- NOAA/ NMFS/ AFSC

Current project leader

- Chris Lunsford, 907-789-6008, chris.lunsford@noaa.gov

Contact person for data and/or results

- Chris Lunsford, 907-789-6008, chris.lunsford@noaa.gov
- www.afsc.noaa.gov/abl/mesa/mesa_sfs_lsd.htm

Principal sampling gear

- bottom longline hook

Number of stations/sets/tows

- ~86 stations, ~ 130 sets, 3600 hooks per set

Principal data collected from above

- catch tallied to species (as much as possible)
- sablefish randomly sampled for length, weight, sex, maturity, otoliths
- lengths randomly collected on 14 major species
- sablefish, Greenland turbot, and shortspine thornyhead randomly tagged

Statistical design

- fixed station systematic

Other gear or sampling methods used in survey

- killer and sperm whale depredation observations

- seabird observations and counts

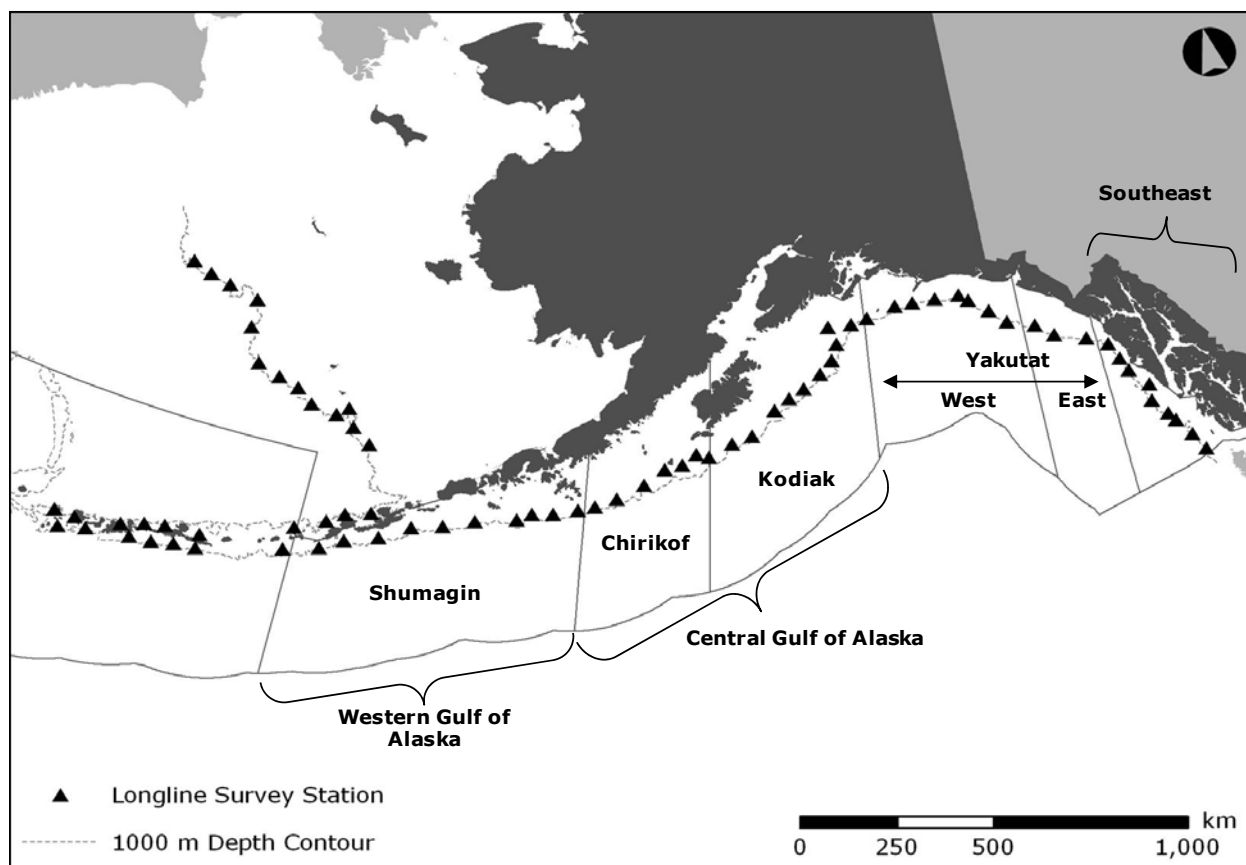
Oceanographic data collected

- surface temp
- surface salinity

Key citation for methodology

- survey protocols: www.afsc.noaa.gov/abl/MESA/pdf/LSprotocols.pdf
- cruise reports: www.afsc.noaa.gov/ABL/MESA/ mesa_sfs_ls.php
- online database: www.afsc.noaa.gov/abl/ mesa/ mesa_sfs_lsd.htm

2.5.3. Figure



2.6. SOUTHEAST ALASKA COASTAL MONITORING – SECM

2.6.1. Presentation: AFSC_Auke_Bay_Surveys.ppt

2.6.2. Summary

Person completing the template

- Joe Orsi, 907-789-6034, joe.orsi@noaa.gov

General location

- Southeast Alaska Icy Strait (58°N, 136°W)

Depth range

- 120-1,300 m bottom depths (surface sampling only, 1-20m depths)

Year survey initiated

- 1997

Years conducted

- 1997-2010

Planned frequency

- Annual

Time of year conducted

- late May, late June, late July, and late August

Government or charter vessel

- R/V John N. Cobb 1997-2007
- chartered vessels from 2008 to present

Agency responsible

- NOAA/ NMFS/ AFSC

Current project leader

- Joe Orsi, 907-789-6034, joe.orsi@noaa.gov

Contact person for data and/or results

- Emily Fergusson, 907-789-6613, emily.fergussoni@noaa.gov

Principal sampling gear

- surface trawl for fish
- Bongo and Norpac nets for zooplankton
- CTD for physical profiles
- bucket for surface chlorophyll/nutrients

Number of stations/sets/tows

- 12 stations each month

Principal data collected from above

- catches sorted to fish and invertebrates species (as much as possible)
- selected specimens sampled for length, sex, weight, ageing parts, fitness (caloric content/lipid content), growth (IGF, scales, otoliths)
- oceanography including conductivity, temperature at depth, zooplankton (species composition and biomass), and surface chlorophyll-a/nutrients

Statistical design

- systematic – transect station line

Other gear or sampling methods used in survey

- marine mammal and bird sightings (opportunistic)

Oceanographic data collected

- CTD casts for temperature, salinity/conductivity, depth, density, pH
- Zooplankton species composition and biomass
- Surface nutrients/chlorophyll

Key citation for methodology

See web site for links to publications: www.afsc.noaa.gov/abl/msi/msi_secm.htm

General information:

Orsi, J. A., M. V. Sturdevant, J. M. Murphy, D. G. Mortensen, and B. L. Wing. 2000. Seasonal habitat use and early marine ecology of juvenile Pacific salmon in southeastern Alaska. N. Pac. Anadr. Fish Comm. Bull. No. 2, 111-122

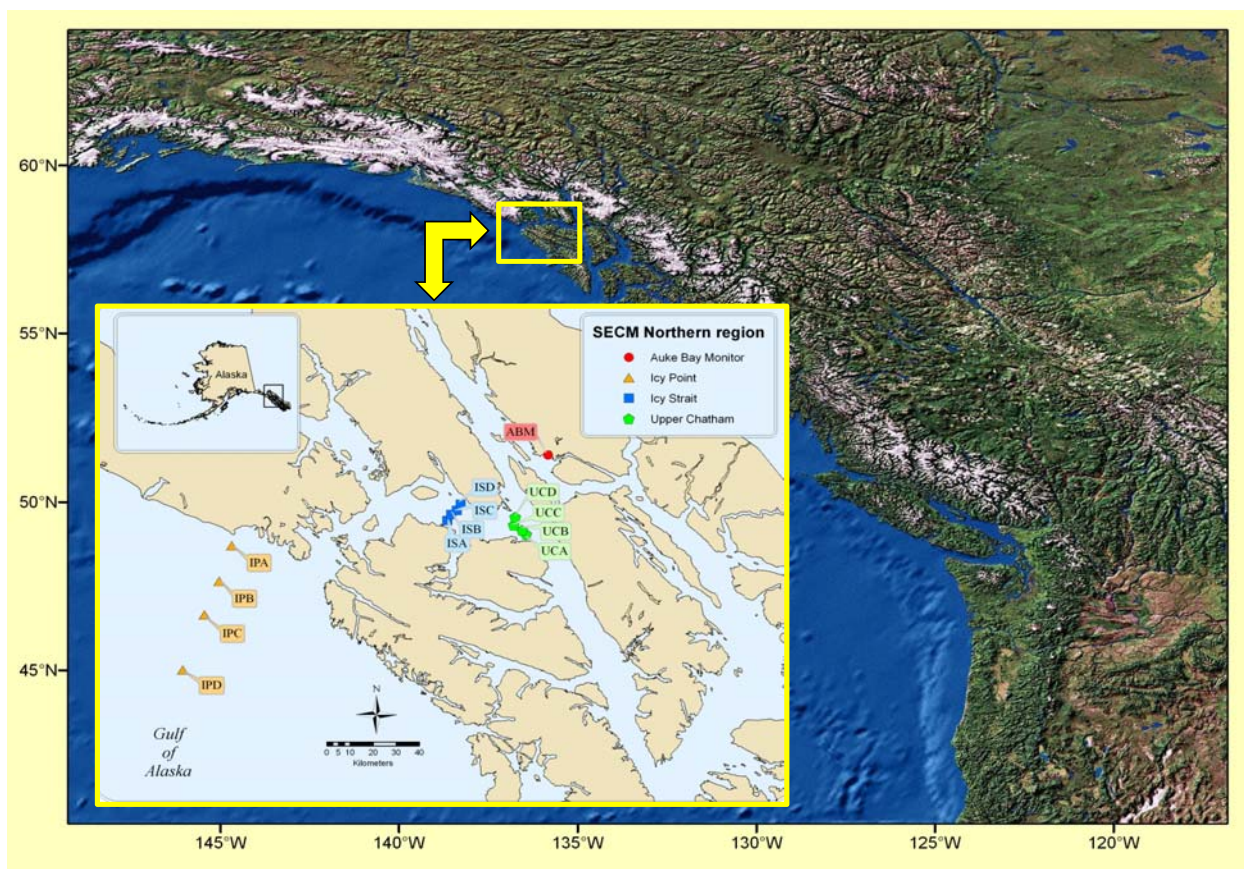
Fish sampling:

Orsi, J. A., J. A. Harding, S. S. Pool, R. D. Brodeur, L. J. Haldorson, J. M. Murphy, J. H. Moss, E. V. Farley Jr., R. M. Sweeting, J. F. T. Morris, M. Trudel, R. J. Beamish, R. L. Emmett, and E. A. Fergusson. 2007. Epipelagic fish assemblages associated with juvenile Pacific salmon in neritic waters of the California Current and the Alaska Current. Pages 105-155 in G. Churchill, R. Brodeur, L. Haldorson, and S. McKinnell, editors. Ecology of Juvenile Salmon in the Northeast Pacific Ocean: Regional Comparisons. American Fisheries Society, Symposium 57, Bethesda, Maryland

Salmonid hatchery/wild stock interactions:

Orsi, J. A., A. C. Wertheimer, M. V. Sturdevant, E. A. Fergusson, D. G. Mortensen, and B. L. Wing. 2004. Juvenile chum salmon consumption of zooplankton in marine waters of southeastern Alaska, a bioenergetics approach to implications of hatchery stock interactions. Rev. Fish Biol. Fish. 14: 335-359

2.6.3. Figure



2.7. BERING ALEUTIAN SALMON INTERNATIONAL SURVEY – BASIS

2.7.1. Presentation: AFSC_Auke_Bay_Surveys.ppt

2.7.2. Summary

Person completing the template

- Ed Farley, 907-789-6085, ed.farley@noaa.gov

General location

- Eastern Bering Sea

Depth range

- 20-500m

Year survey initiated

- 2000

Years conducted

- 2000-2010 in southern Bering Sea (stations south of 60N)
- 2002-2007; 2009-2010 in northern Bering Sea (stations north of and including 60N)

Planned frequency

- design is for every year, but some years missed in northern Bering Sea

Time of year conducted

- August – early October

Government or charter vessel

- R/V Oscar Dyson and charter vessel

Agency responsible

- NOAA/ NMFS/ AFSC

Current project leader

- Ed Farley, 907-789-6085, ed.farley@noaa.gov
- Jim Murphy
- Lisa Eisner

Contact person for data and/or results

- Ed Farley, 907-789-6085, ed.farley@noaa.gov

Principal sampling gear

- midwater trawl for fish
- CTD
- Bongo
- Pairvet nets
- niskin bottles for physical and biological oceanography

Number of stations/sets/tows

- ~185

Principal data collected from above

- catches sorted to fish and invertebrates species (as much as possible)
- selected specimens sampled for length, sex, weight, ageing parts, fitness (caloric content/lipid content), genetics, growth (IGF, scales, otoliths)

- oceanography including conductivity, temperature at depth, continuous surface sea temperature and salinity, fluorescence, chlorophyll-a, nutrients, phytoplankton (species comp and productivity experiments), and zooplankton (species comp and biomass)

Statistical design

- systematic – standard station grid

Other gear or sampling methods used in survey

- marine mammal and bird sightings (opportunistic)
- routine capture of acoustic backscatter data and net sampling to determine abundance of age 0 and 1 groundfish species (Pollock and cod)

Oceanographic data collected

- continuous measurements of surface temp, salinity, fluorescence
- CTD casts for temperature, salinity/conductivity, depth, light absorption, oxygen, chl-a
- nutrients (niskin bottle collections at several depths)
- phytoplankton species composition and productivity
- zooplankton species composition and biomass

Key citation for methodology

Fish:

Farley, E.V., Jr., J.M. Murphy, B.W. Wing, J.H. Moss, and A. Middleton.
2005. Distribution, migration pathways, and size of western Alaska juvenile salmon along the eastern Bering Sea shelf. Alaska Fishery Research Bulletin 11(1)
15-26

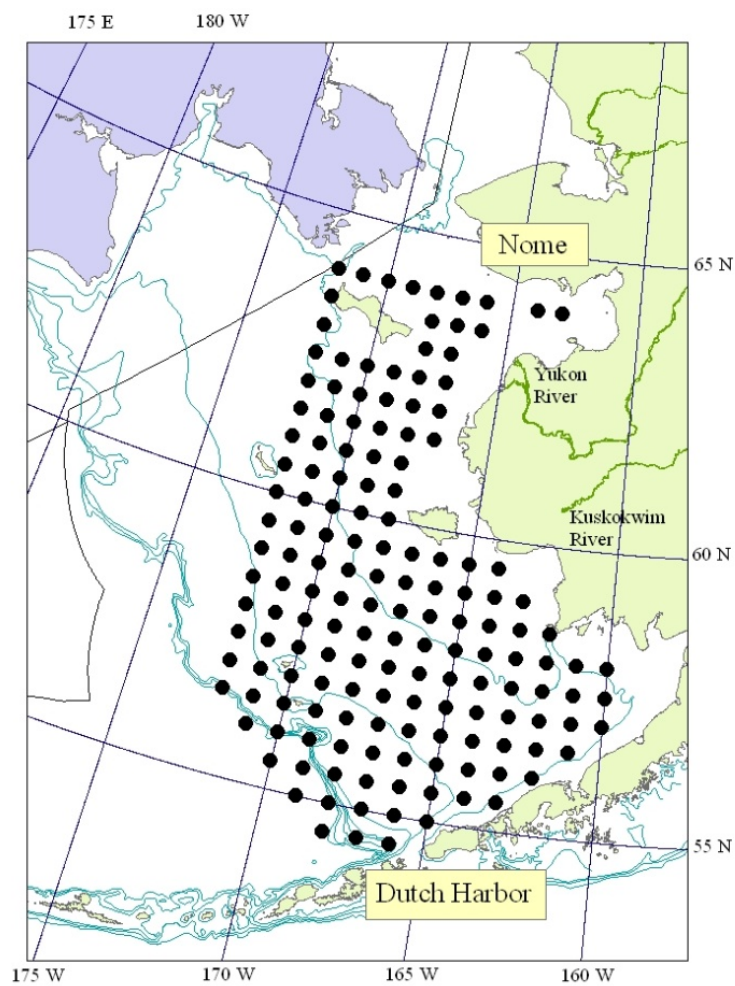
Physical Oceanography:

Danielson, S., L. Eisner, T. Weingartner, and K. Aagaard. 2010. Thermal and haline variability over the central Bering Sea shelf
seasonal and interannual perspectives. Continental Shelf Research, doi
10.1016/j.csr.2010.12.010

Zooplankton:

Coyle, K.O., L.B. Eisner, F.J. Mueter, A.I. Pinchuk, M.A. Janout, K.D. Ciciel, E.V. Farley, and A.G. Andrews. 2011. Climate change in the southeastern Bering sea impacts on Pollock stocks and implications for the oscillating control hypothesis. Fisheries Oceanography, 20(2)

2.7.3. Figure



2.8. GULF OF ALASKA INTEGRATED ECOSYSTEM RESEARCH PROJECT - GOAIERP

2.8.1. Presentation: AFSC_Auke_Bay_Surveys.ppt

2.8.2. Summary

Person completing the template

- Jamal Moss, jamal.moss@noaa.gov, (907)789-6609

General location

- Eastern and central GOA

Depth range

- 40-2,000 m

Year survey initiated

- 2010

Years conducted

- 2010-2011

Planned frequency

- Design is biannual (summer and fall)

Time of year conducted

- July-October

Government or charter vessel

- Charter vessel

Agency responsible

- NOAA/ NMFS

Current project leader

- Jamal Moss, jamal.moss@noaa.gov, (907)789-6609

Contact person for data and/or results

- Jamal Moss, jamal.moss@noaa.gov, (907)789-6609

Principal sampling gear

- Pelagic trawl

Number of stations/sets/tows

- ~200

Principal data collected from above

- Catches sorted to fish and invertebrates species (as much as possible)
- Selected specimens sampled for length, weight, genetics

Statistical design

- Grid

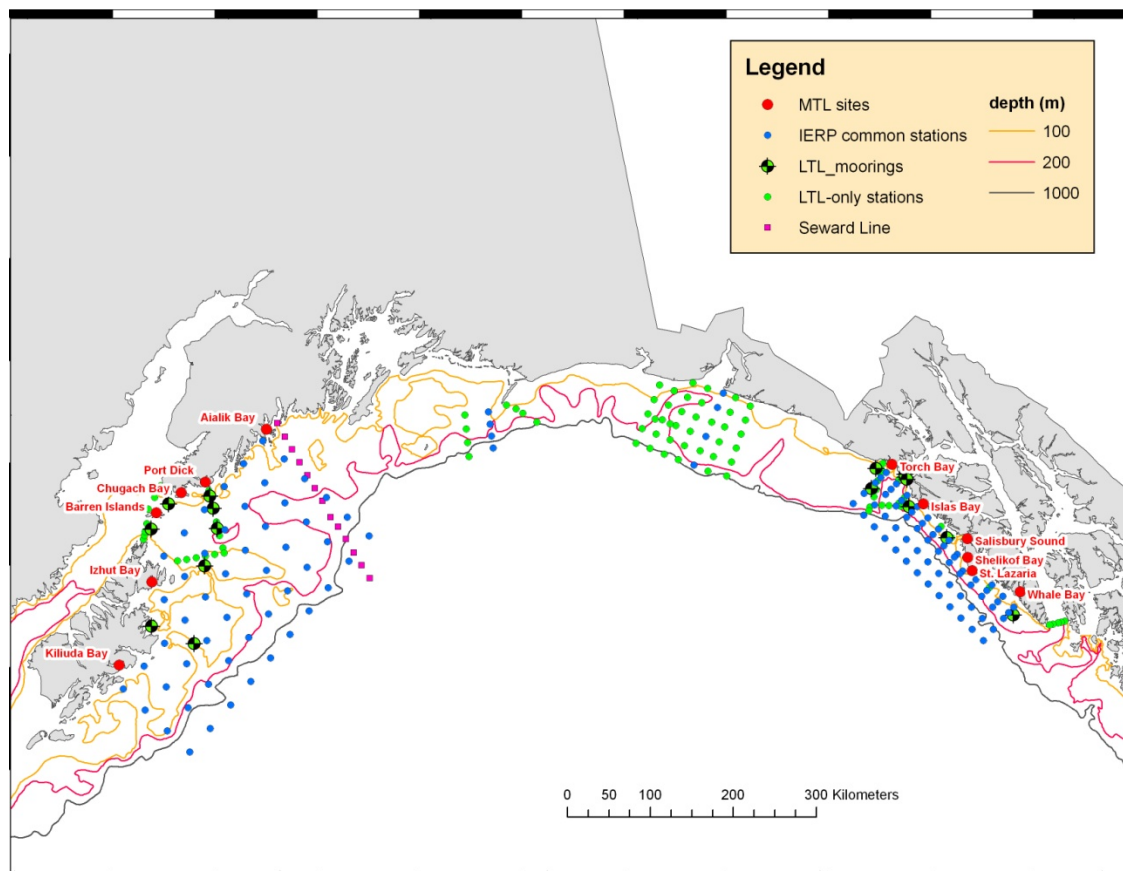
Other gear or sampling methods used in survey

- Marine mammal and bird sightings
- Routine capture of acoustic backscatter data
- Zooplankton sampling

Oceanographic data collected

- Surface temp
- CTD casts for temperature, salinity/conductivity, depth, light absorption, nutrients, Chlorophyll A

2.8.3. Figure



3. NOAA, NMFS, NORTHWEST REGION

3.1. NWFSC WEST COAST GROUND FISH BOTTOM TRAWL SURVEY

3.1.1. Presentation: NWFSC_West_Coast.ppt

3.1.2. Summary

Person completing the template

- Aimee Keller, 206-860-3460, aimee.keller@noaa.gov

General location

- US-Canada border to US-Mexico border

Depth range

- 55-1280 m

Year survey initiated

- 1998 (2003 in current form)

Years conducted

- 1998 – 2002
- 2003 – 2010 (current form)

Planned frequency

- annually

Time of year conducted

- mid-May to July; mid-August to October

Government or charter vessel

- charter 4 west coast fishing vessels

Agency responsible

- NOAA/ NMFS/ NWFSC

Current project

- Aimee Keller, 206-860-3460, aimee.keller@noaa.gov

Contact person for data and/or results

- Beth Horness, 206-860-3311, beth.horness@noaa.gov

Principal sampling gear

- Aberdeen bottom trawl

Number of stations/sets/tows

- ~750

Principal data collected from above

- catches sorted to fish and invertebrates species (as much as possible)
- selected specimens sampled for length, sex, weight, ageing parts, genetics, and maturities and stomachs (revolving selected species)

Statistical design

- stratified random

Other gear or sampling methods used in survey

- marine debris

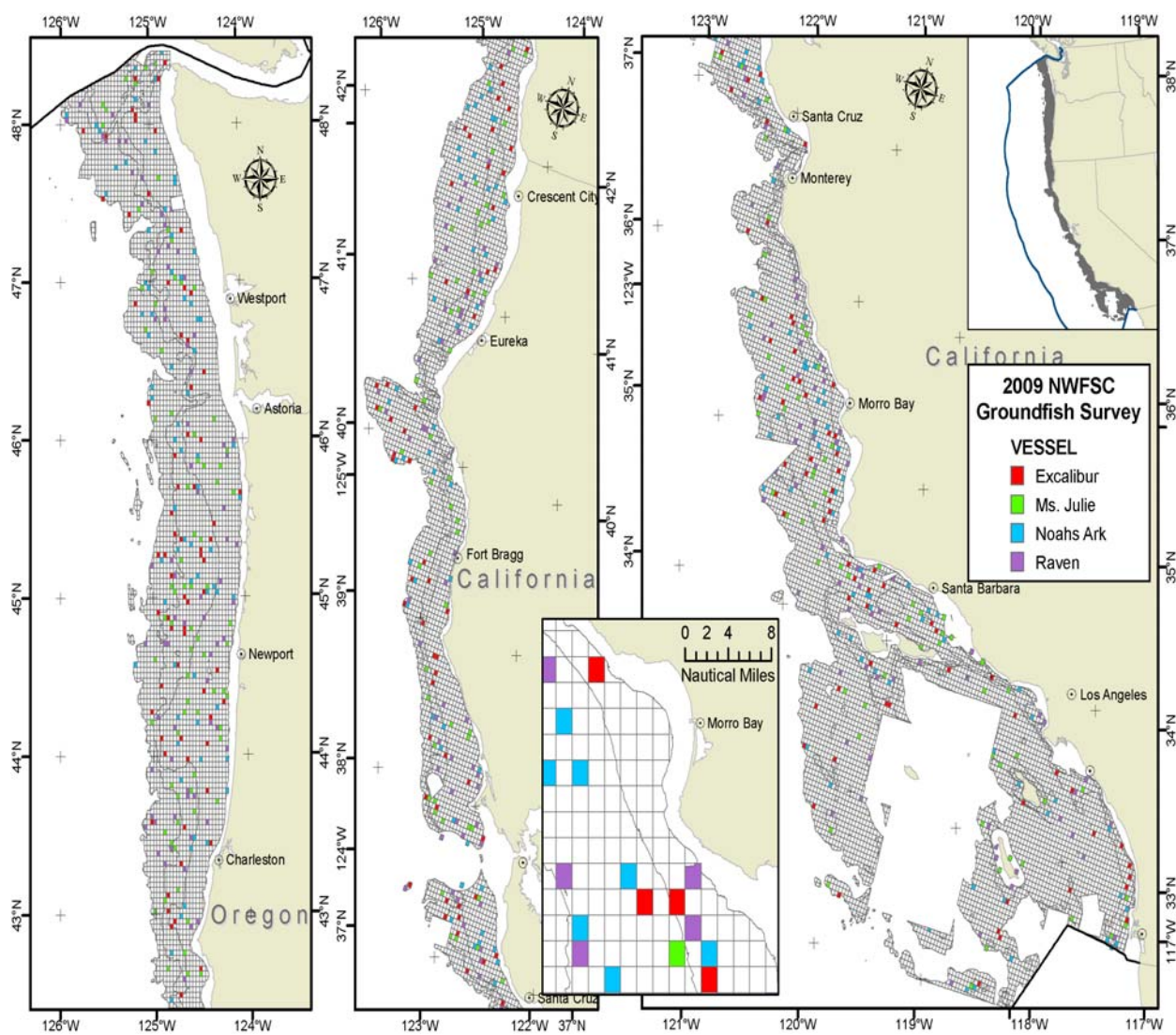
Oceanographic data collected

- trawl-mounted CTD (conductivity, temperature, depth) with light absorption, oxygen, etc

Key citation for methodology

Keller, A.A., Horness, B.H., Fruh, E.L., Simon, V.H., Tuttle, V.J., Bosley, K.L., Buchanan, J.C., Kamikawa, D.J., and Wallace, J.R. 2008. The 2005 U.S. West Coast bottom trawl survey of groundfish resources off Washington, Oregon, and California: Estimates of distribution, abundance, and length composition. U.S. Dept. Commer., NOAA Tech. Memo. NMFS-NWFSC-93

3.1.3. Figure



3.2. NWFSC HOOK AND LINE SURVEY FOR SHELF ROCKFISH IN SOUTHERN CALIFORNIA

3.2.1. Presentation:NWFSC_Hook_And_Line.ppt

3.2.2. Summary

Person completing the template

- John Harms, 206-860-3414, john.harms@noaa.gov

General location

- southern California Bight

Depth range

- 37-227 m

Year survey initiated

- 2003 (pilot)

Years conducted

- 2003 - present

Planned frequency

- annual

Time of year conducted

- Late September to early October

Government or charter vessel

- chartered commercial passenger fishing vessels (CPFV; e.g., “party boats”)

Agency responsible

- NOAA/ NMFS/ NWFSC

Current project leader

- John Harms, 206-860-3414, john.harms@noaa.gov

Contact person for data and/or results

- John Harms, 206-860-3414, john.harms@noaa.gov

Principal sampling gear

- Hook and line gear deployed by rod and reel

Number of stations/sets/tows

- 121 stations; 3 anglers each make 5 drops of a 5-hook sampling gangion at each station = total of 75 hooks deployed per station

Principal data collected from above

- catch sorted to species
- catch rate data used to calculate relative abundance indices for key rockfish species
- all rockfish specimens sampled for length, sex, weight, ageing parts, and genetics
- subset of some species of interest sampled for maturity, voucher specimens, etc

Statistical design

- Fixed station
- Data analyzed in a Bayesian GLM

Other gear or sampling methods used in survey

- seafloor video for habitat classification collected at a subset of survey sites (or at least were being collected - camera sled currently residing beneath 100 m of water in the Channel Islands; we hope to retrieve it)

- patented genetic hooks deployed as part of an ongoing genetic mark-recapture project
- Oceanographic data collected
- surface temperature
 - weather and ocean conditions
 - vertical CTD (conductivity, temperature, depth) casts with oxygen

Key citation for methodology

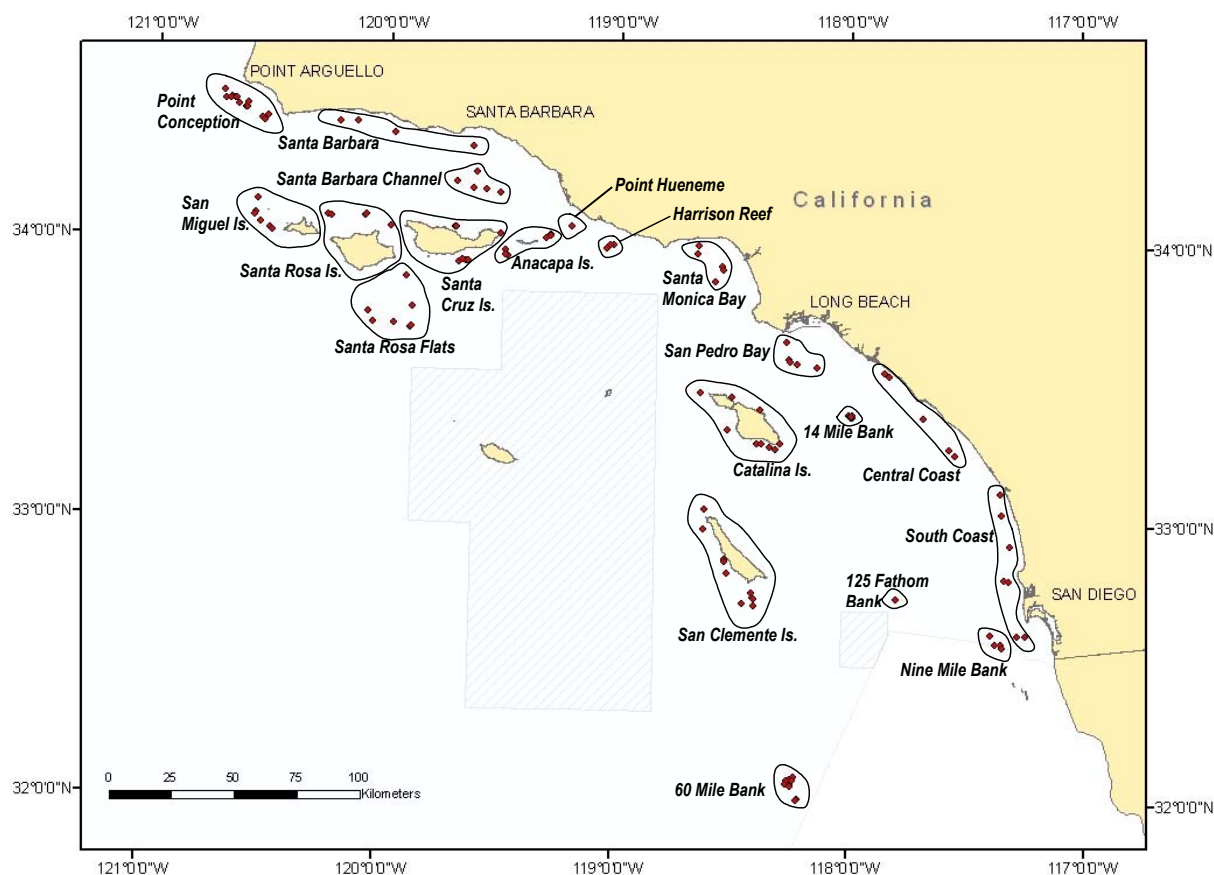
Design:

Harms, J.H., J.A. Benante, and R.M. Barnhart.2008.The 2004-2007 hook and line survey of shelf rockfish in the Southern California Bight estimates of distribution, abundance, and length composition.U.S. Dept. of Commer., NOAA Tech. Memo.NMFS0NWFSC-95, 110 p

Analysis:

Harms, J.H., J.R. Wallace, and I.J. Stewart.2010.Analysis of fishery-independent hook and line-based data for use in the stock assessment of bocaccio rockfish (*Sebastes paucispinis*).Fish. Res. 106, 298-309

3.2.3. Figure



Map of the Southern California Bight showing the 121 Hook and Line Survey stations broken down into 20 sampling areas. The boundary between the U.S. and Mexican Exclusive Economic Zones is indicated by the change in shading in the lower right portion of the map. The hatched areas indicate the two Cowcod Conservation Areas

4. NOAA, NMFS, SOUTHWEST REGION

4.1. SWFSC ROCKFISH RECRUITMENT AND ECOSYSTEM ASSESSMENT SURVEY

4.1.1. Presentation: SWFSC_Rockfish_Recruitment.ppt

4.1.2. Summary

Person completing the template

- Keith Sakuma, 831-420-3945, keith.sakuma@noaa.gov

General location

- California, USA

Depth range

- 40-3000 m

Year survey initiated

- 1983

Years conducted

- 1983-2010

Planned frequency

- Annual

Time of year conducted

- May-June

Government or charter vessel

- 1983-2009 government R/V David Starr Jordan and R/V Miller Freeman
- 2010 Charter F/V Frosti

Agency responsible

- NOAA/ NMFS/ SWFSC

Current project leader

- John Field, 831-420-3907, john.field@noaa.gov

Contact person for data and/or results

- Keith Sakuma, 831-420-3945, keith.sakuma@noaa.gov

Principal sampling gear

- Cobb midwater trawl

Number of stations/sets/tows

- 73 stations
- ~150 tows/year

Principal data collected from above

- catches sorted to fish and invertebrates species (as much as possible)
- selected specimens sampled for length
- YOY rockfish sampled for length, otoliths, and genetics

Statistical design

- Fixed station using GLM

Other gear or sampling methods used in survey

- marine mammal and bird sightings
- routine capture of acoustic backscatter data

- bongo tows for early life stages of krill

Oceanographic data collected

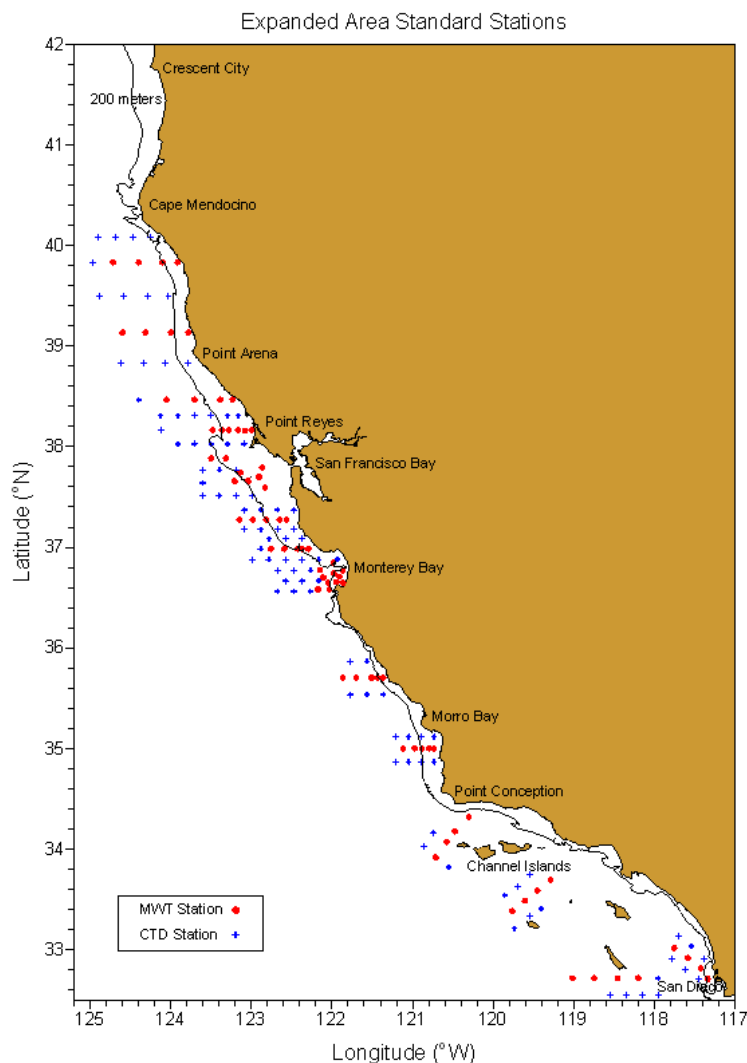
- surface temperature, salinity, and chlorophyll
- CTD casts for temperature, salinity/conductivity, depth, light absorption, oxygen, chlorophyll

Key citation for methodology

Wyllie-Echeverria, T., W.H. Lenarz, and C.A. Reilly.1990.Survey of the abundance and distribution of pelagic young-of-the-year rockfish, *Sebastes*, off central California.U.S. Dep. Commer., NOAA Tech. Memo., NOAA-TM-NMFS-SWFSC-147, 125 pp

Sakuma, K.M., S. Ralston, and V.G. Wespestad.2006.Interannual and spatial variation in the distribution of young-of-the-year rockfish (*Sebastes* spp.) expanding and coordinating a survey sampling frame.Calif. Coop. Oceanic Fish. Invest. Rep. 47: 127-139

4.1.3. Figure



4.2. SALMON OCEAN ECOLOGY (CALIFORNIA)

4.2.1. Not presented

4.2.2. Summary

Person completing the template

- Jeffrey Harding, 831-420-3938, jeff.harding@noaa.gov, NOAA, NMFS, SWFSC, Salmon Ocean Ecology Team, 110 Shaffer Rd., Santa Cruz, CA 95060

General location

- northern and central California, southern Oregon

Depth range

- surface trawl (0-15 m)

Years conducted

- 1998 - 2005, 2007, 2010

Planned frequency

- annual

Time of year conducted

- 2 weeks in June/July and 2 weeks in Sep/Oct

Government or charter vessel

- charter (FV Frosti) and government (RV Jordan, RV Shimada)

Agency responsible

- NOAA/ NMFS

Current project leader

- Sean Hayes, 831-420-3937, sean.hayes@noaa.gov

Contact person for data and/or results

- Jeffrey Harding, 831-420-3938, jeff.harding@noaa.gov

Principal sampling gear

- 264 Nordic rope trawl, fished at the surface (30 min @ 3.0 kts)

Number of stations

- ~65 stations per cruise (current design)

Principal data collected

- samples sorted to fish and invertebrate species (as much as possible) and counted directly or indirectly by subsample
- 50 individuals of each species measured (length)
- all juvenile salmon retained for laboratory analysis (DNA, gut contents, parasites, lipids, otoliths, etc.)

Statistical design

- fixed stations on fixed transect lines, appx. 0.5 degree latitude spacing

Other gear / methods

- zooplankton samples using 0.5m 200µm vertical net
- zooplankton samples using 300µm bongo net, oblique tow
- water samples filtered for phytoplankton (chlorophyll)
- seabird sightings (counts on measured transects)
- towed acoustic receiver for hydro-acoustic tag detection

Oceanographic data

- surface temperature, Secchi disk depth
- CTD casts for temperature, salinity, depth, chlorophyll, transmissivity, PAR

Citation for methodology

Harding, J. A., A. J. Ammann, and R. B. MacFarlane (in press). Regional and seasonal patterns of epipelagic fish assemblages from the central California Current. Fishery Bulletin

MacFarlane, R. B., S. Ralston, C. Royer, and E. C. Norton. 2005. Juvenile Chinook salmon (*Oncorhynchus tshawytscha*) growth on the central California coast during the 1998 El Niño and 1999 La Niña. Fish. Oceanogr. 14: 321-332

4.2.3. Figure not provided

5. NOAA, NMFS, NORTHEAST REGION

5.1. NEFSC SPRING MULTISPECIES BOTTOM TRAWL SURVEY

5.1.1. Presentation: NEFSC_Surveys.ppt

5.1.2. Summary

Person completing the template

- Linda Despres, 508-495-2346, Linda.Despres@noaa.gov

General location

- U.S. continental shelf waters from Cape Hatteras, NC to the Nova Scotia Shelf, including Georges Bank and the Gulf of Maine

Depth range

- 20-365 m

Year survey initiated

- 1968

Years conducted

- 1968-2011

Planned frequency

- annually

Time of year conducted

- February-May

Government or charter vessel

- government, currently FSV Henry B. Bigelow
- historically: R/V Albatross IV, R/V Delaware II, R/V Atlantic Twin

Agency responsible

- NOAA/ NMFS/ NEFSC

Current project leader

- Dr. Russell Brown, 508-495-2380, Russell.Brown@noaa.gov

Contact person for data and/or results

- Dr Russell Brown, 508-495-2380, Russell.Brown@noaa.gov

Principal sampling gear

- NEFSC standardized 400 x 12, 3 bridle bottom trawl

Number of stations/sets/tows

- ~ 380

Principal data collected from above

- catches sorted to fish and invertebrates species
- selected specimens sampled for length, sex, maturity stage, weight, ageing parts

Statistical design

- stratified random

Other gear or sampling methods used in survey

- EK-60 for routine capture of acoustic backscatter data
- 61 cm bongo frame for plankton collections
- Simrad PI 32 for net/door monitoring observations

Oceanographic data collected

- CTD casts for temperature, salinity/conductivity, depth

Key citation for methodology

Grosslein, M. D. 1969. Groundfish survey program of BCF Woods Hole. Commer. Fish. Rev. 31 (8-9): 22-35

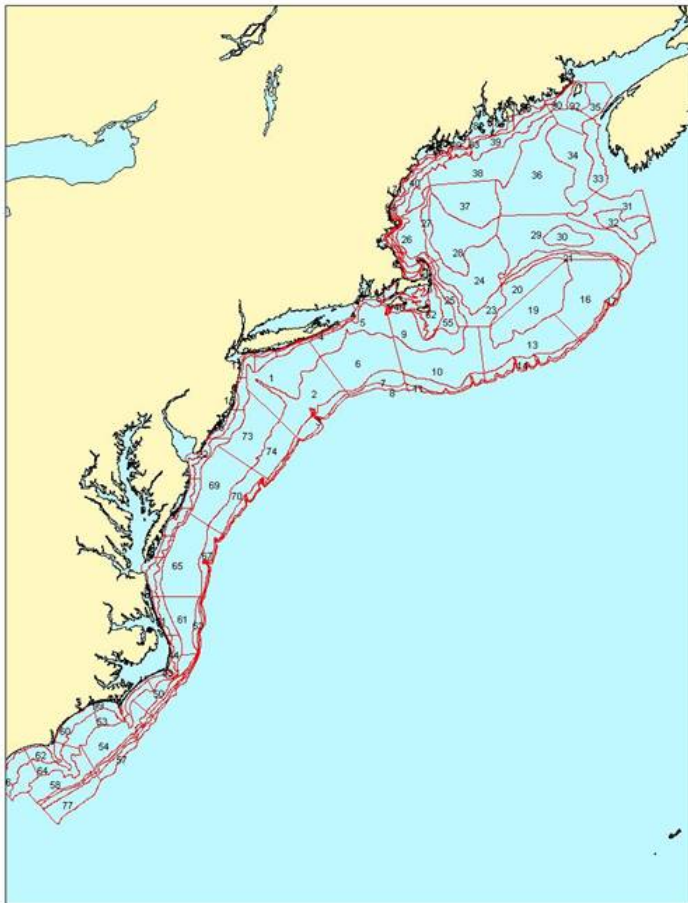
Grosslein, M. D. 1969a. Groundfish survey methods. NMFS, Woods Hole, Lab. Ref.Doc. No. 69-2, 34 p

Grosslein, M. D. 1969b. Data Processing methods for groundfish surveys. NMFS, Woods Hole, Lab. Ref.Doc. No. 69-3, 60 p

Grosslein, M. D. 1974. Bottom Trawl survey methods of the Northeast Fisheries Center, Woods Hole, MA USA. ICNAF Res. Doc. 74/96

Azarovitz, T.R. 1981. A Brief Historical Review of the Woods Hole Laboratory Trawl Survey Time Series. In W.G. Doubleday and D. Rivard (ed.) Bottom Trawl Surveys. Can. Spec. Publ. Fish. Aquatic. Sci. 58: 62-67

5.1.3. Figure



5.2. NEFSC AUTUMN MULTISPECIES BOTTOM TRAWL SURVEY

5.2.1. Presentation: NEFSC_Surveys.ppt

5.2.2. Summary

Person completing the template

- Linda Despres, 508-495-2346, Linda.Despres@noaa.gov

General location

- U.S. continental shelf waters from Cape Hatteras, NC to the Nova Scotia Shelf, including Georges Bank and the Gulf of Maine

Depth range

- 20-365 m

Year survey initiated

- 1963

Years conducted

- 1963-2010

Planned frequency

- annually

Time of year conducted

- September-November

Government or charter vessel

- government, currently FSV Henry B. Bigelow
- historically, Albatross IV

Agency responsible

- NOAA/ NMFS/ NEFSC

Current project leader

- Dr. Russell Brown, 508-495-2380, Russell.Brown@noaa.gov

Contact person for data and/or results

- Dr Russell Brown, 508-495-2380, Russell.Brown@noaa.gov

Principal sampling gear

- NEFSC standardized 400 x 12, 3 bridle bottom trawl

Number of stations/sets/tows

- ~ 375

Principal data collected from above

- catches sorted to fish and invertebrates species
- selected specimens sampled for length, sex, maturity stage, weight, ageing parts

Statistical design

- stratified random

Other gear or sampling methods used in survey

- EK-60 for routine capture of acoustic backscatter data
- 61 cm bongo frame for plankton collections
- Simrad PI 32 for net/door monitoring observations

Oceanographic data collected

- CTD casts for temperature, salinity/conductivity, depth

Key citation for methodology

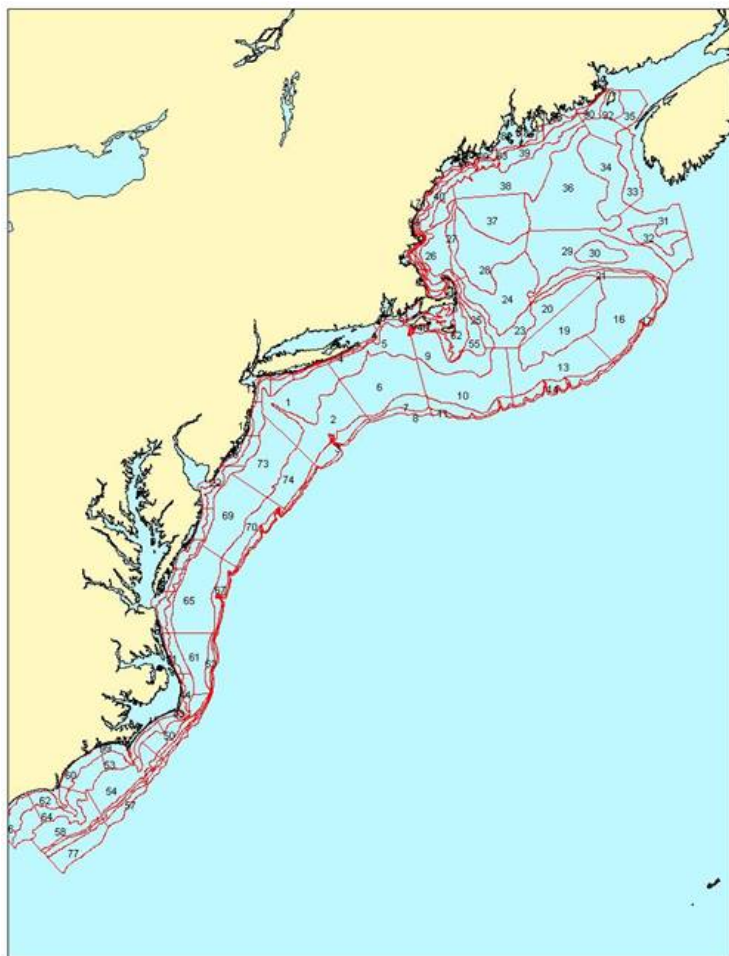
Grosslein, M. D. 1969. Groundfish survey program of BCF Woods Hole. Commer. Fish. Rev. 31 (8-9): 22-35

Grosslein, M. D. MS 1969a. Groundfish survey methods. NMFS, Woods Hole, Lab. Ref.Doc. No. 69-2, 34 p

Grosslein, M. D. 1969b. Data Processing methods for groundfish surveys. NMFS, Woods Hole, Lab. Ref.Doc. No. 69-3, 60 p

Grosslein, M. D. 1974. Bottom Trawl survey methods of the Northeast Fisheries Center, Woods Hole, MA USA. ICNAF Res. Doc. 74/96

Azarovitz, T.R. 1981. A Brief Historical Review of the Woods Hole Laboratory Trawl Survey Time Series. In W.G. Doubleday and D. Rivard (ed.) Bottom Trawl Surveys. Can. Spec. Publ. Fish. Aquatic. Sci. 58: 62-67

5.2.3. Figure

5.3. NEFSC NORTHERN SHRIMP BOTTOM TRAWL SURVEY

5.3.1. Presentation: NEFSC_Surveys.ppt

5.3.2. Summary

Person completing template

- Peter Chase, 508-495-2348, Peter.Chase@noaa.gov

General location

- Gulf of Maine, Northwest Atlantic Ocean

Depth range

- 20-250 m

Year survey initiated

- 1983

Years conducted

- 1983-2010

Planned frequency

- annually

Time of year conducted

- July-August

Government or charter vessel

- government, currently R/V Gloria Michelle

Agency responsible

- Atlantic States Marine Fisheries Commission (ASMFC)
- NOAA/ NMFS/ NEFSC

Current project leader

- Peter Chase, 508-495-2348, Peter.Chase@noaa.gov

Contact person for data and/or results

- Russell Brown, 508-495-2380, Russell.Brown@noaa.gov

Principal sampling gear

- four seam modified commercial shrimp trawl

Number of stations

- ~ 80

Principal data collected from above

- catches sorted to fish and invertebrate species
- total weight and individual lengths collected for all fish species and non-shrimp invertebrate species
- total weight and individual lengths collected for each stage of northern shrimp *Pandalus borealis* (i.e. male, female I, female II, transitional)
- total weight and counts collected for all other shrimp species
- ageing parts are collected from selected fish species

Statistical design

- stratified random

Other gear or sampling methods used in survey

- net mensuration sensors on doors, wings, and headrope to characterize net geometry

- bottom contact sensor on sweep of net

Oceanographic data collected

- surface temp
- temperature and depth sensor is placed on wing of net during each tow

Key citation for methodology

Operations Manual for the Gulf of Maine Northern Shrimp Survey, NOAA
Fisheries/Northeast Fisheries Science Center, Ecosystems Surveys Branch, Woods Hole,
MA

5.3.3. Figure not provided

5.4. NEFSC ATLANTIC HERRING ACOUSTIC SURVEY

5.4.1. Presentation: NEFSC_Surveys.ppt

5.4.2. Summary

Person completing the template

- Dr. Michael Jech, 508-495-2353, Michael.Jech@noaa.gov

General location

- Gulf of Maine and Georges Bank
- Northwest Atlantic Ocean

Depth range

- 25-400 m

Year survey initiated

- 1998

Years conducted

- 1998-2010

Planned frequency

- annual

Time of year conducted

- September-October

Government or charter vessel

- government, currently FRV Delaware II

Agency responsible

- NOAA/ NMFS/ NEFSC

Current project leader

- Dr. Michael Jech, 508-495-2353, Michael.Jech@noaa.gov

Contact person for data and/or results

- Dr. Michael Jech, 508-495-2353, Michael.Jech@noaa.gov

Principal sampling gear

- scientific echo sounder, Simrad EK-60
- Irish Midwater Trawl

Number of stations/sets/tows

- ~ 70 trawls per cruise; acoustic data collected continuously

Principal data collected from above

- calibrated volume backscatter data from the transducer to the sea bed, continuously throughout the survey
- acoustic data post-processed and classified (as much as possible)

Statistical design

- systematic parallel; other designs for site-specific work

Other gear or sampling methods used in survey

- midwater trawl
- catches sorted to fish and invertebrates
- selected specimens (Atlantic herring) sampled for length, sex, maturity stage, weight, ageing parts, genetics

- marine mammal and bird sightings (opportunistic)
- neuston tows (opportunistic)
- underwater video
- underwater acoustics (e.g., DIDSON, echo sounder)

Oceanographic data collected

- surface temperature
- surface conductivity (salinity)
- Acoustic Doppler Current Profiler (ADCP)
- meteorological data and observations
- CTD casts for temperature, salinity/conductivity, depth

Key citation for methodology

Jech, J. M., and W. L. Michaels. 2006. A multifrequency method to classify and evaluate fisheries acoustics data. *Can. J. Fish. Aquat. Sci.* 63: 2225-2235

5.4.3. Figure not provided

5.5. NEFSC SEA SCALLOP DREDGE SURVEY

5.5.1. Presentation: NEFSC_Surveys.ppt

5.5.2. Summary

Person completing the template

- Victor Nordahl, 508-495-2334, Vic.Nordahl@noaa.gov

General location

- U.S. continental shelf waters from the Middle Atlantic Bight to Georges Bank, including waters within Canada's Exclusive Economic Zone

Depth range

- 30-150 m

Year survey initiated

- 1977

Years conducted

- 1977-2010

Planned frequency

- annual

Time of year conducted

- May –July

Government or charter vessel

- charter, currently UNOLS R/V Hugh R Sharp
- historically, R/V Albatross IV

Agency responsible

- NOAA/ NMFS/ NEFSC

Current project Leader

- Dr. Russell Brown, 508-495-2380, Russell.Brown@noaa.gov

Contact person for data and/or results

- Dr. Russell Brown, 508-495-2380, Russell.Brown@noaa.gov

Principal sampling gear

- 8' wide New Bedford scallop dredge

Number of stations/sets/tows

- ~ 450

Principal data collected from above

- catches sorted to invertebrates and fish species
- total weight and individual lengths collected for targeted invertebrates and selected fish species
- selected specimens sampled for sex, individual weight, maturity stage and ageing parts

Statistical design

- stratified random

Other gear or sampling methods used in survey

- tilt and roll sensor for ground contact determination and tow distance

Oceanographic data collected

- surface temp
- CTD casts for temperature, salinity/conductivity, depth

Key citation for methodology

Regional Operating Protocols for Standard Sea Scallop Dredge Survey, NOAA
Fisheries/Northeast Fisheries Science Center, Ecosystems Surveys Branch, Woods Hole,
MA

5.5.3. Figure not provided

5.6. NEFSC SURFCLAM AND OCEAN QUAHOG SURVEY

5.6.1. Presentation: NEFSC_Surveys.ppt

5.6.2. Summary

Person completing the template

- Victor Nordahl, 508-495-2334, Vic.Nordahl@noaa.gov

General location

- U.S. continental shelf waters from Southern Virginia (Delmarva) north to Georges Bank including waters within Canada's Exclusive Economic Zone

Depth range

- 30-120 m

Year survey initiated

- 1978

Years conducted

- annually from 1978-1984
- surveys conducted approximately every three years starting in 1986

Planned frequency

- triennial

Time of year conducted

- June – August

Government or charter vessel

- government, currently FRV Delaware II

Agency responsible

- NOAA/ NMFS/ NEFSC

Current project leader

- Dr. Russell Brown, 508-495-2380, Russell.Brown@noaa.gov

Contact person for data and/or results

- Dr. Russell Brown, 508-495-2380, Russell.Brown@noaa.gov

Principal sampling gear

- clam dredge configured with a submersible pump and 60" blade

Number of stations

- ~ 450

Principal data collected from above

- catches sorted to invertebrates and fish species
- total weight and individual lengths collected for targeted invertebrates and selected fish species
- selected specimens sampled for sex, individual weight, maturity stage and ageing parts

Statistical design

- stratified random

Other gear or sampling methods used in survey

- dredge performance sensor package
- archiving sensors for tilt, roll, manifold pressure and ambient temperature and pressure
- grab sampler

Oceanographic data collected

- surface temp
- CTD casts for temperature, salinity/conductivity, depth

Key citation for methodology

Regional Operating Protocols for Standard Hydro-dynamic Dredge Surveys: Surfclams and Ocean Quahogs, NOAA Fisheries/Northeast Fisheries Science Center, Ecosystems Surveys Branch, Woods Hole, MA

5.6.3. Figure not provided

6. STATE, ALASKA

6.1. SMALL-MESH SHRIMP AND FORAGE FISH TRAWL SURVEY IN THE GULF OF ALASKA

6.1.1. Presentation: ADFG_Small_Mesh.ppt

6.1.2. Summary

Person completing the template

- Aaren Ellsworth, 907-486-1840, aaren.ellsworth@alaska.gov

General location

- Central Gulf of Alaska

Depth range

- 20-170m

Year survey initiated

- 1971, standardized with federal trawl survey in 1972

Years conducted

- 1971-1987, 1989, 1992, 1995, 1998, 2000-2010
- federal surveys in 1953-2001, 2003-2004
- NMFS surveyed one bay only (Pavlof) in 1989, 1991-2001, 2003-2004

Planned frequency

- Some areas get surveyed annually, but most are on a biannual schedule beginning in 2000

Time of year conducted

- September/October, in recent years (1992-2010)

Government or charter vessel

- Government, R/V Resolution

Agency responsible

- ADFG, cooperatively with NMFS

Current project leader

- Aaren Ellsworth, 907-486-1840, aaren.ellsworth@alaska.gov

Contact person for data and/or results

- Aaren Ellsworth, 907-486-1840, aaren.ellsworth@alaska.gov
- Kally Spalinger, 907-486-1940, kally.spalinger@alaska.gov

Principal sampling gear

- bottom trawl

Number of stations/sets/tows

- long-term average of 207 tows
- average 126 tows (n = 92-160) 2000-2010

Principal data collected from above

- Determine species composition of the catch by haul and survey area
- Obtain length frequency distributions for commercially important shrimp and fish species
- Obtain composite samples of predominate shrimp species for each bay surveyed and analyze each sample for sex and length frequency
- Compare relative abundance of shrimp to recent and historic survey data to make inferences about population trends
- Generate density estimates for forage fish species from the areas trawled

- Collect stomachs from 7 species for NMFS

Statistical design

- stratified random

Other gear or sampling methods used in survey

- CTD

Oceanographic data collected

- CTD casts for temperature

Key citation for methodology

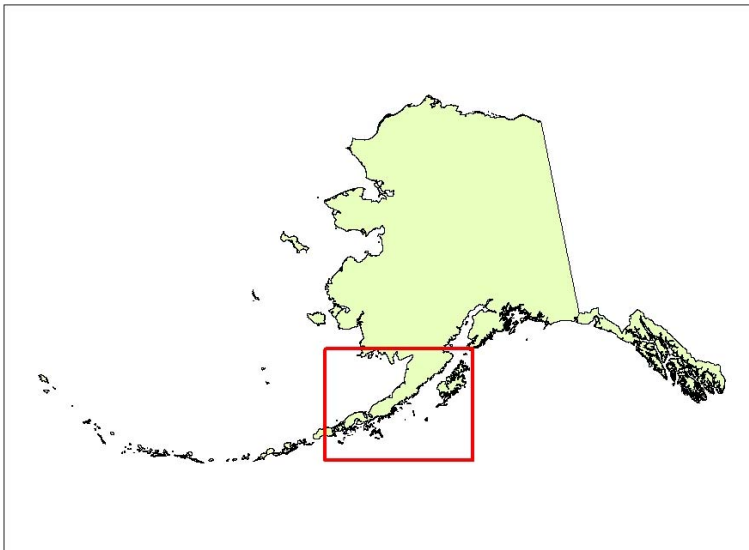
Alverson, D. L., and W. T. Pereyra.1969. Demersal fish explorations in the northeastern Pacific Ocean-an evaluation of exploratory fishing methods and analytical approaches to stock size and yield forecasts.Journal of Fisheries Research Board of Canada 26: 1985-2001

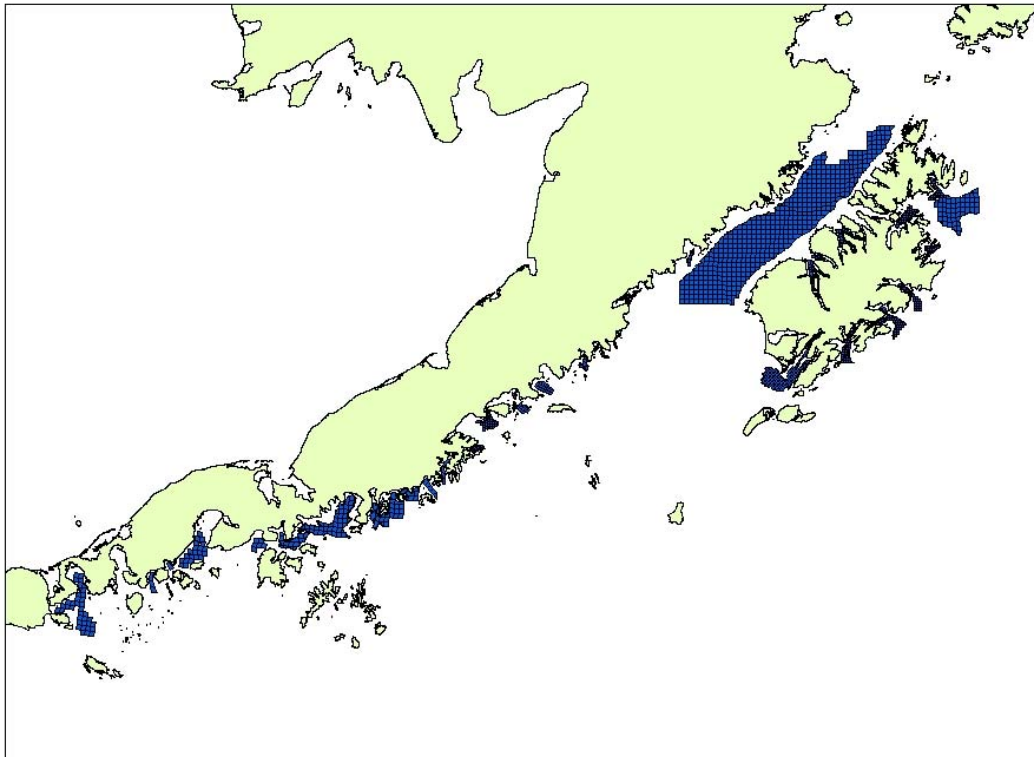
Butler, T. H.1980. Shrimps of the Pacific coast of Canada. Can.Bull. Fish. Aquat. Sci. 202: 280pp

Jackson, D. R.2003. Project operational plan small-mesh bottom trawl survey of shrimp and forage fishes: Kodiak, Chignik, and South Peninsula Districts.Alaska Department of Fish and Game, Division of Commercial Fisheries, Regional Information Report 4K03-47, Kodiak

McCrary, J. A.1971.Sternal spines as a characteristic for differentiating between females of some Pandalidae.J. Fish. Res. Bd. Canada 28, 99-100

6.1.3. Figure





6.2. LARGE-MESH BOTTOM TRAWL SURVEY OF CRAB AND GROUND FISH IN THE KODIAK, CHIGNIK, SOUTH PENINSULA, AND EASTERN ALEUTIAN MANAGEMENT DISTRICTS

6.2.1. Presentation: ADFG_Large_Mesh.ppt

6.2.2. Summary

Person completing the template

- Kally Spalinger; 907-486-1844; kally.spalinger@alaska.gov

General location

- Central and Western Gulf of Alaska

Depth range

- 15-290m

Year survey initiated

- 1987

Years conducted

- 1987-2010

Planned frequency

- Annual

Time of year conducted

- June-September

Government or charter vessel

- Government, R/V Resolution

Agency responsible

- ADFG

Current project leader

- Kally Spalinger; 907-486-1844; kally.spalinger@alaska.gov

Contact person for data and/or results

- Kally Spalinger; 907-486-1844; kally.spalinger@alaska.gov

Principal sampling gear

- bottom trawl

Number of stations/sets/tows

- ~380 current stations

Principal data collected from above

- Species composition of the catch by haul and management area
- Length frequency distributions for commercially-important shellfish and groundfish species
- Abundance estimates and condition of Tanner crab populations to determine fishery harvest levels
- Density estimates of commercially-important groundfish in survey area
- Sex, age, and diet information from selected species

Statistical design

- systematic

Other gear or sampling methods used in survey

- routine capture of acoustic backscatter data

Oceanographic data collected

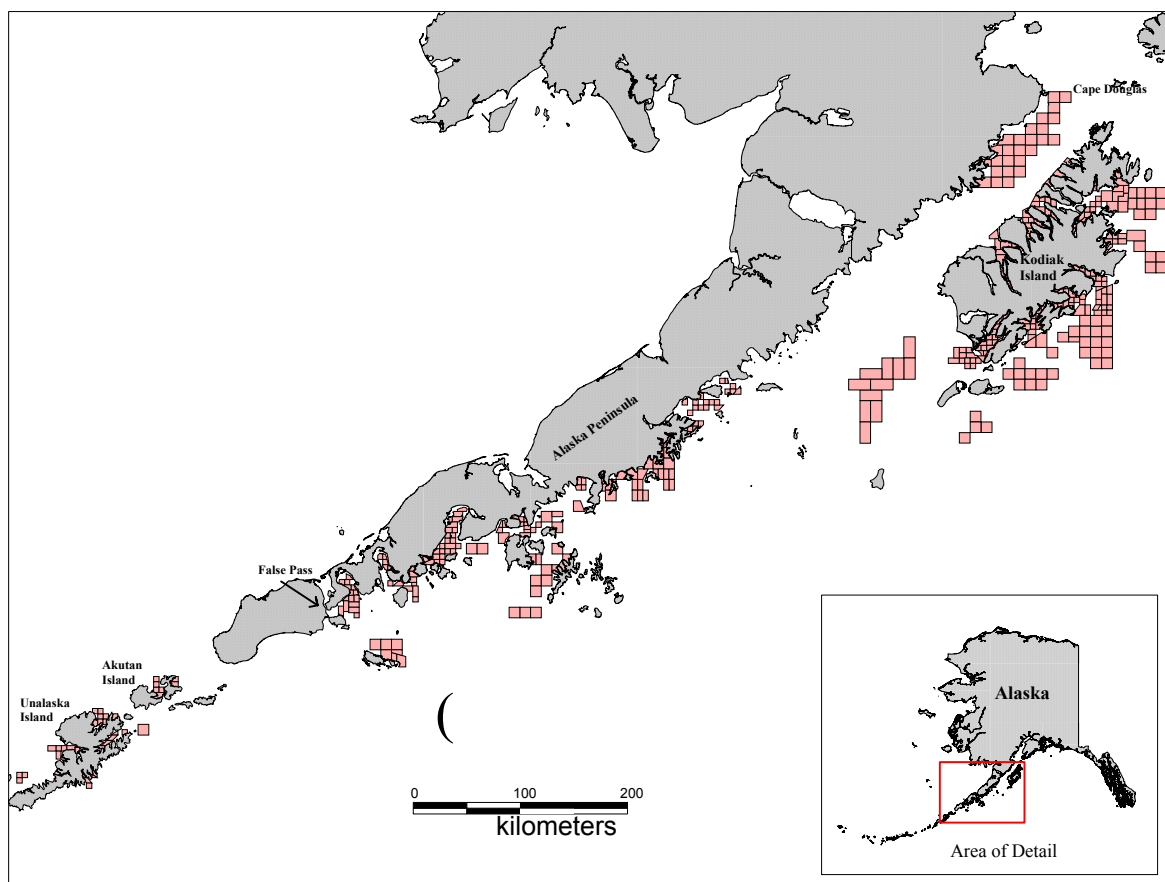
- TD on trawl net for bottom temperature

Key citation for methodology

Spalinger, K., and M. E. Cavin. 2004. Standard project operational plan: Bottom trawl survey of crab and groundfish: Kodiak, Chignik, South Alaska Peninsula, and Eastern Aleutian Areas. Alaska Department of Fish and Game, Division of Commercial Fisheries, Regional Information Report 4K04-47, Kodiak.

<http://www.sfadfg.state.ak.us/FedAidPDFs/rir.4k.2004.47.pdf>

6.2.3. Figure



Survey stations for the annual ADFG large-mesh bottom trawl survey of crab and groundfish Kodiak, Chignik, South Peninsula, and Eastern Aleutian management districts

6.3. ADFG CENTRAL REGION LARGE-MESH TRAWL SURVEYS

6.3.1. Presentation: ADFG_Central_Surveys.ppt

6.3.2. Summary

Person completing the template

- Richard Gustafson, 907-235-8191, richard.gustafson@alaska.gov
- Mike Byerly, 907-235-8191 mike.byerly@alaska.gov

General location

- Cook Inlet - Kachemak Bay, and Kamishak Bay
- Prince William Sound (PWS) - Orca Bay, North Montague, Hinchinbrook, and Valdez Arm

Depth range

- 23-481 m

Year survey initiated

- 1989

Years conducted

- Kachemak Bay: 1989-Present (annual)
- Kamishak Bay: 1990-2007 (annual), 2010-Present (biennial)
- PWS: 1991-1995, 1997-2011 (biennial)

Planned frequency

- annual or biennial depending on location

Time of year conducted

- Kachemak Bay: Most years June to early August, except 1989 in October, 2006 to 2008 in September, and 2009 in October
- Kamishak: July to August
- PWS: July to August

Government or charter vessel

- Government (ADFG), all years on the R/V Pandalus, beginning 2011 on the R/V Pandalus and R/V Solstice

Agency responsible

- ADFG

Current project leader

- Kenneth J. Goldman. Ph.D., 907-235-8191, ken.goldman@alaska.gov

Contact person for data and/or results

- Richard Gustafson, 907-235-8191, richard.gustafson@alaska.gov
- Margaret Spahn, 907-235-8191, margaret.spahn@alaska.gov
- Mike Byerly, 907-235-8191, mike.byerly@alaska.gov

Principal sampling gear

- 400-mesh Eastern with a 70 ft headrope and 95 ft footrope from 1989 to 2002. 400-mesh Eastern with a 78 ft headrope and 95 ft footrope from 2003 to present

Number of stations/sets/tows

- Kachemak Bay: 15-26; 35-40 beginning in 2011
- Kamishak Bay: 16-23; 23 randomly chosen since 2007

- PWS: 32-50

Principal data collected from above

- Catch number and weight for commercially important crab and groundfish species including; Tanner crab, red king crab, Dungeness crab, Pacific cod, Walleye pollock, rockfishes, lingcod, skates, and sharks
- Remaining catch subsampled, identified to lowest possible taxa and enumerated and weighted
- Target specimens sampled for length/width, chela height (male Tanner crab) sex, weight, age structures
- Some sampling for genetics, isotopes, stomach contents, histology, and containments
- Tow speed, time, depth, distance, and position

Statistical design

- Kachemak Bay: Fixed station index
- Kamishak: Fixed station index and random since 2007
- PWS: Fixed station index

Other gear or sampling methods used in survey

- Video for net performance and to derive gear efficiency estimates for target species
- Net mensuration using NetMind trawl monitoring system

Oceanographic data collected

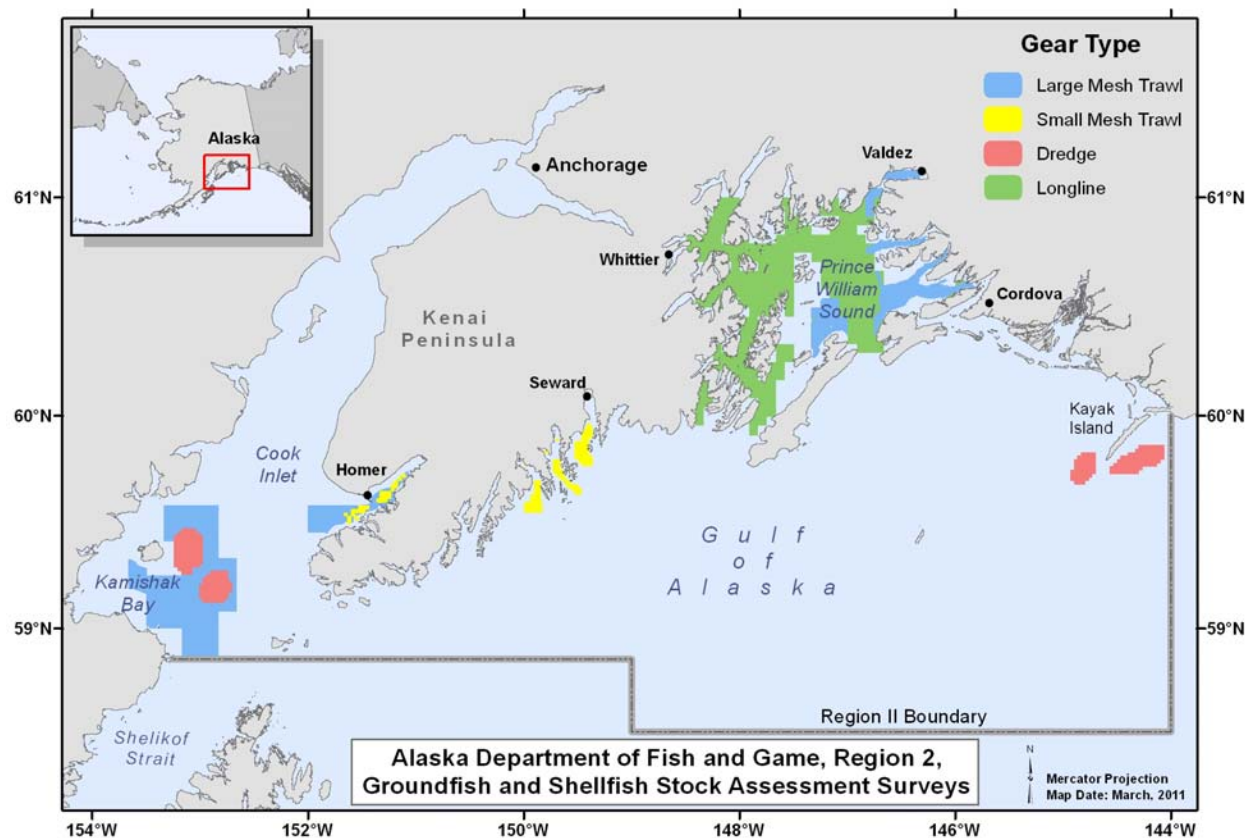
- surface temp
- temperature/depth
- CTD casts in some years for temperature, salinity/conductivity, depth, oxygen

Key citation for methodology

Bechtol, W.R. 2005. A bottom trawl survey for crabs and groundfish in the Southern, Kamishak and Barren Islands District of the Cook Inlet Management Area, 20-June and 10-17 July 2000. Alaska Department of Fish and Game, Fishery Data Series No. 05-40, Anchorage

Note: Updated reports are expected within one year and can be disseminated to TSC group if desired

6.3.3. Figure



6.4. ADFG SMALL-MESH TRAWL SURVEY FOR SHRIMP AND GROUND FISH

6.4.1. Presentation: ADFG_Central_Surveys.ppt

6.4.2. Summary

Person completing the template

- Richard Gustafson, 907-235-8191, richard.gustafson@alaska.gov

General location

- Cook Inlet - Kachemak Bay
- North Gulf of Alaska Coast - Resurrection Bay, Aialik Bay, Harris Bay

Depth range

- Kachemak Bay: 26-165m
- North Gulf of Alaska Coast: 91-170m

Year survey initiated

- Kachemak Bay: 1975
- North Gulf of Alaska Coast: 1984

Years conducted

- Kachemak Bay: 1976 to 1993 annually, 1995 to 2003 triennially, and 2004 to 2006 annually
- North Gulf of Alaska Coast: 1994, 2005, 2006, 2007

Planned frequency

- discontinued due to lack of funding

Time of year conducted

- Kachemak Bay: 1976 to 1990 May and October, 1991 to 2006 May
- North Gulf of Alaska Coast: 1994 June to July, 2005 April to May, 2006 October, 2007 May

Government or charter vessel

- Government (ADFG) R/V Pandalus for most years
- R/V Resolution and chartered vessels for four of the surveys

Agency responsible

- ADFG

Current project leader

- Kenneth J. Goldman. Ph.D., 907-235-8191, ken.goldman@alaska.gov

Contact person for data and/or results

- Richard Gustafson, 907-235-8191, richard.gustafson@alaska.gov
- Margaret Spahn, 907-235-8191, margaret.spahn@alaska.gov
- Mike Byerly, 907-235-8191, mike.byerly@alaska.gov

Principal sampling gear

- 61 ft NMFS Highrise shrimp trawl

Number of stations/sets/tows

- Kachemak Bay: 29-32
- North Gulf of Alaska Coast: 13-20

Principal data collected from above

- Catch number and weight for commercially important invertebrate and groundfish species including; Pandalid shrimp, Tanner crab, red king crab, Dungeness crab, Pacific cod, Walleye pollock, rockfishes, lingcod, skates, and sharks
- Remaining catch subsampled, identified to lowest possible taxa and enumerated and weighted
- Target specimens sampled for length/width, sex, weight, age structures
- Tow speed, time, depth, distance, and position

Statistical design

- Kachemak Bay: Stratified random initially, changed to stratified fixed station index
- North Gulf of Alaska Coast: Stratified systematic

Oceanographic data collected

- surface temp
- temperature/depth
- CTD casts in some years for temperature, salinity/conductivity, depth, oxygen

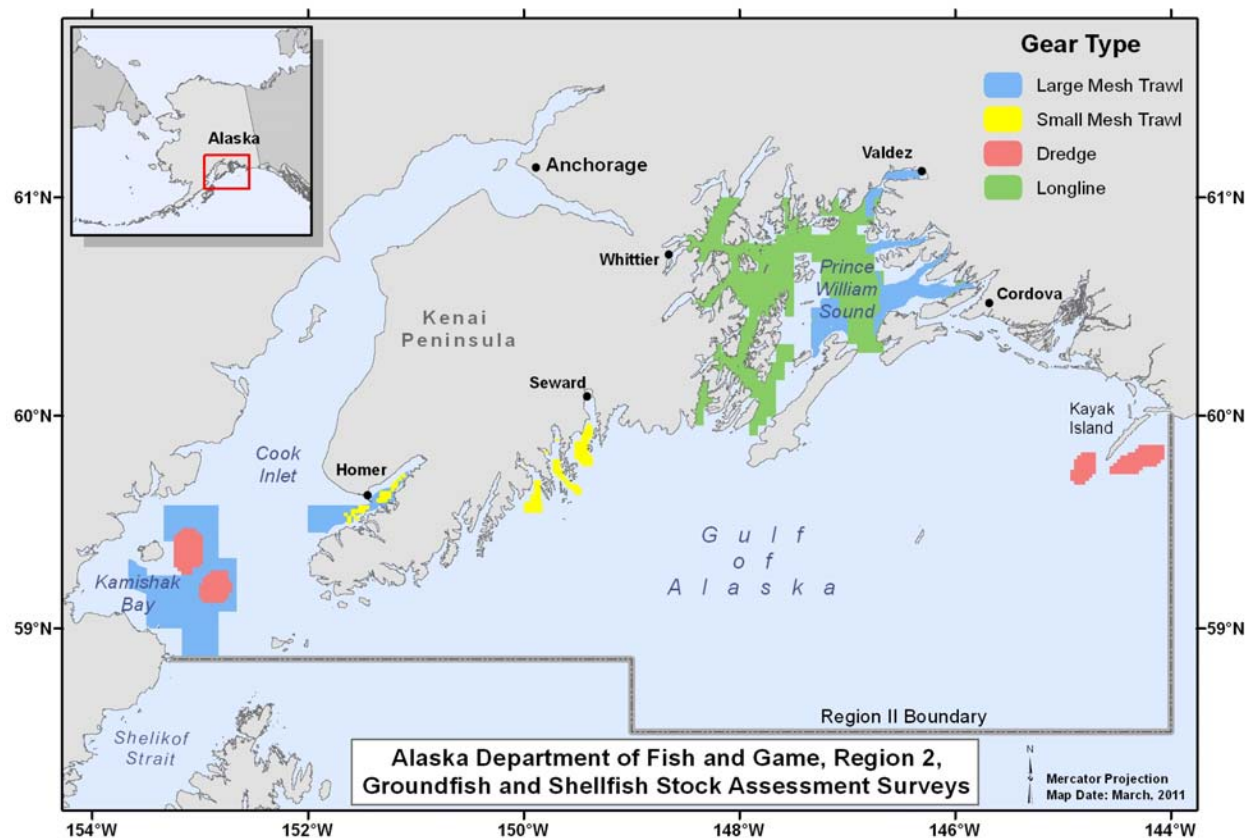
Key citation for methodology

Gustafson, R.L. and W.R. Bechtol. 2005. Kachemak small-mesh trawl survey, 2000. Alaska Department of Fish and Game, Fishery Data Series No. 05-54, Anchorage

Goldman, K.J., R.L. Gustafson, and M. Byerly. 2007. Monitoring Ecosystem Parameters in the Northern Gulf of Alaska, Exxon Valdez Oil Spill Restoration Project Final Report (GEM Project G-040639), Alaska Department of Fish and Game, Division of Commercial Fisheries, Homer, Alaska

Gustafson, R.L. and K.J. Goldman. Alaska Department of Fish and Game. 2009. Northern Gulf of Alaska Shrimp Assessment. Nearshore Marine Research in Alaska (VIII): Final Comprehensive Progress Report. NOAA Cooperative Agreement NA06NMF4370117

6.4.3. Figure



6.5. ADFG CENTRAL REGION SABLEFISH LONGLINE SURVEY

6.5.1. Presentation: ADFG_Central_Surveys.ppt

6.5.2. Summary

Person completing the template

- Mike Byerly, 907-235-8191, mike.byerly@alaska.gov

General location

- Prince William Sound and North Gulf of Alaska Coast

Depth range

- 150 – 750m

Year survey initiated

- 1996

Years conducted

- Prince William Sound: 1996 – 2006 annually
- North Gulf of Alaska Coast: 1999, 2000, and 2002

Planned frequency

- survey ended in 2006 and is not planned to continue
- a sablefish tagging survey using longline pot gear was conducted in March, 2011 and will recur annually depending on available funding

Time of year conducted

- August to September, longline hook; March, longline pot

Government or charter vessel

- Government R/V Pandalus or R/V Solstice
- The 2011 survey was conducted off of a charter vessel, future years (if funding available) will be conducted off of R/V Solstice

Agency responsible

- ADFG

Current project leader

- Kenneth J. Goldman. Ph.D., 907-235-8191, ken.goldman@alaska.gov

Contact person for data and/or results

- Mike Byerly, 907-235-8191, mike.byerly@alaska.gov
- Margaret Spahn, 907-235-8191, margaret.spahn@alaska.gov

Principal sampling gear

- Individual sets comprised fifteen, 100 m skates containing forty-five size 13/0 circle hooks

Number of stations/sets/tows

- Prince William Sound: 29 to 38 sets / year
- North Gulf of Alaska Coast: 6 to 12 sets / year

Principal data collected from above

- Species catch per hook, ineffective and unbaited hooks
- Sablefish and other target species systematically sampled for length, weight, sex, maturity, and age
- Non-sablefish target species include: rockfishes, sharks, Pacific cod, Walleye pollock

- All other species enumerated
- Set time, depth, and position

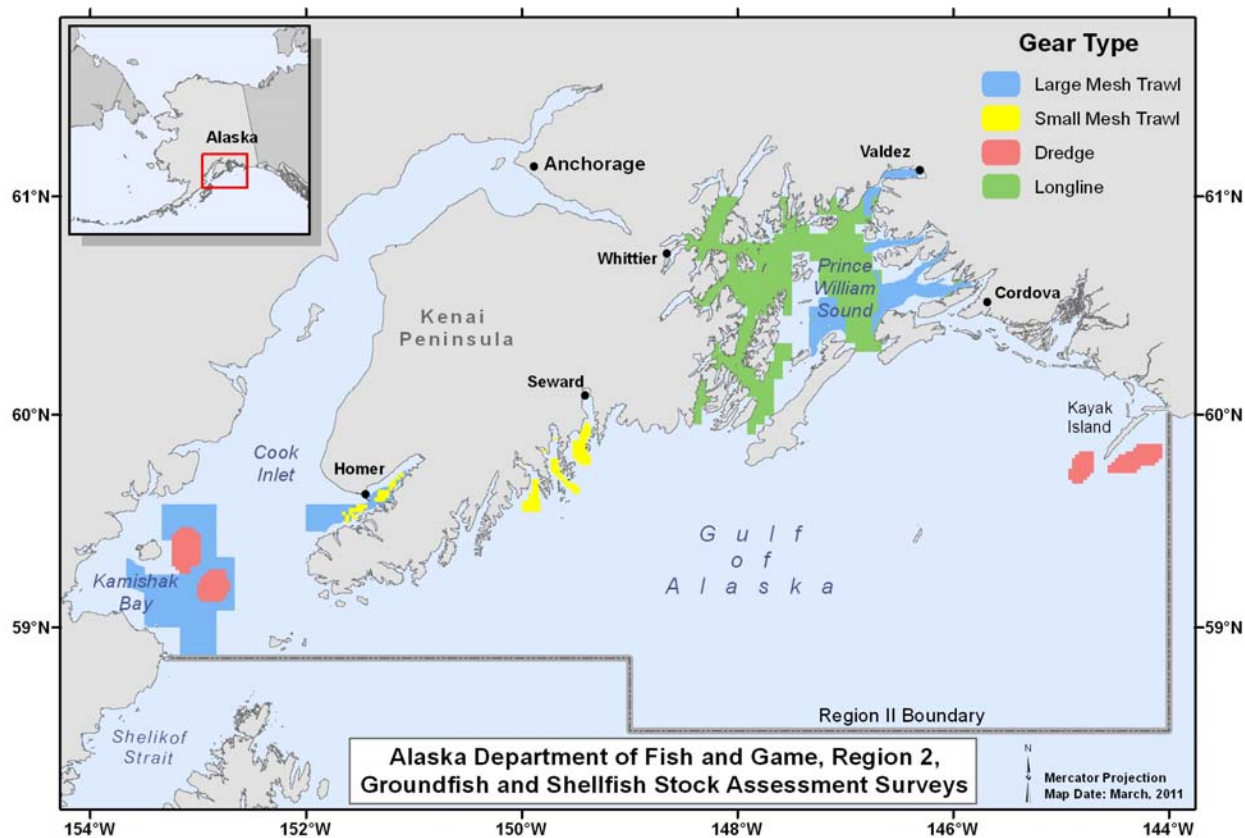
Statistical design

- Random stratified design. Prince William Sound was stratified by 100 m depth intervals and into four geoFigure regions. The north-western region was sampled each year while remaining effort was rotated annually among the other regions. Stations were selected from sampling grid of 1 km² stations. The north gulf coast was stratified by 100 m depth intervals

Key citation for methodology

Bechtol, W.R., and J. Vansant, III. 2001. Relative abundance of sablefish and other groundfish caught on longline gear in Prince William Sound, Alaska, 1998. Alaska Department of Fish and Game, Division of Commercial Fisheries Management and Development, Regional Information Report 2A01-15, Anchorage

6.5.3. Figure



6.6. ADFG CENTRAL REGION DREDGE SURVEYS FOR WEATHERVANE SCALLOPS

6.6.1. Presentation: ADFG_Central_Surveys.ppt

6.6.2. Summary

Person completing the template

- Richard Gustafson, 907-235-8191, richard.gustafson@alaska.gov

General location

- Cook Inlet - Kamishak Bay
- Gulf of Alaska - Kayak Island

Depth range

- 35-152m

Year survey initiated

- Kamishak Bay: 1984
- Kayak Island: 1995

Years conducted

- Kamishak Bay: 1984, 1996 to 2009 biannually
- Kayak Island: 1995, 1996 to 2010 biannually

Planned frequency

- Biennial: Kamishak Bay in odd years and Kayak Island in even years

Time of year conducted

- May to June all years, except August in 1984 and July to August in 1996

Government or charter vessel

- government, R/V Pandalus and or R/V Solstice beginning in 2010

Agency responsible

- ADFG

Current project leader

- Kenneth J. Goldman. Ph.D., 907-235-8191, ken.goldman@alaska.gov

Contact person for data and/or results

- Richard Gustafson, 907-235-8191, richard.gustafson@alaska.gov
- Margaret Spahn, 907-235-8191, margaret.spahn@alaska.gov
- Mike Byerly, 907-235-8191, mike.byerly@alaska.gov

Principal sampling gear

- 8' New Bedford Style dredge (heavier version 1600lb 4" rings and lighter 800lb 3" rings version both had a 1.5" stretch mesh liner 24 thread

Number of stations/sets/tows

- Kamishak Bay: 75-79
- Kayak Island: 60-66

Principal data collected from above

- Weathervane scallops enumerated, weighed, and measured
- Subsampled for age, meat weight, sex, and maturity
- Remaining catch subsampled, identified to lowest possible taxa and enumerated and weighted
- Tow speed, time, depth, distance, and position

Statistical design

- There are two beds in each survey area. Each bed is sampled using a two stage systematic design

Other gear or sampling methods used in survey

- Video equipment to document dredge efficiency
- Comparison with camera sled
- Developed and are testing a sled-dredge for potential replacement of 8' dredge for assessment work

Oceanographic data collected

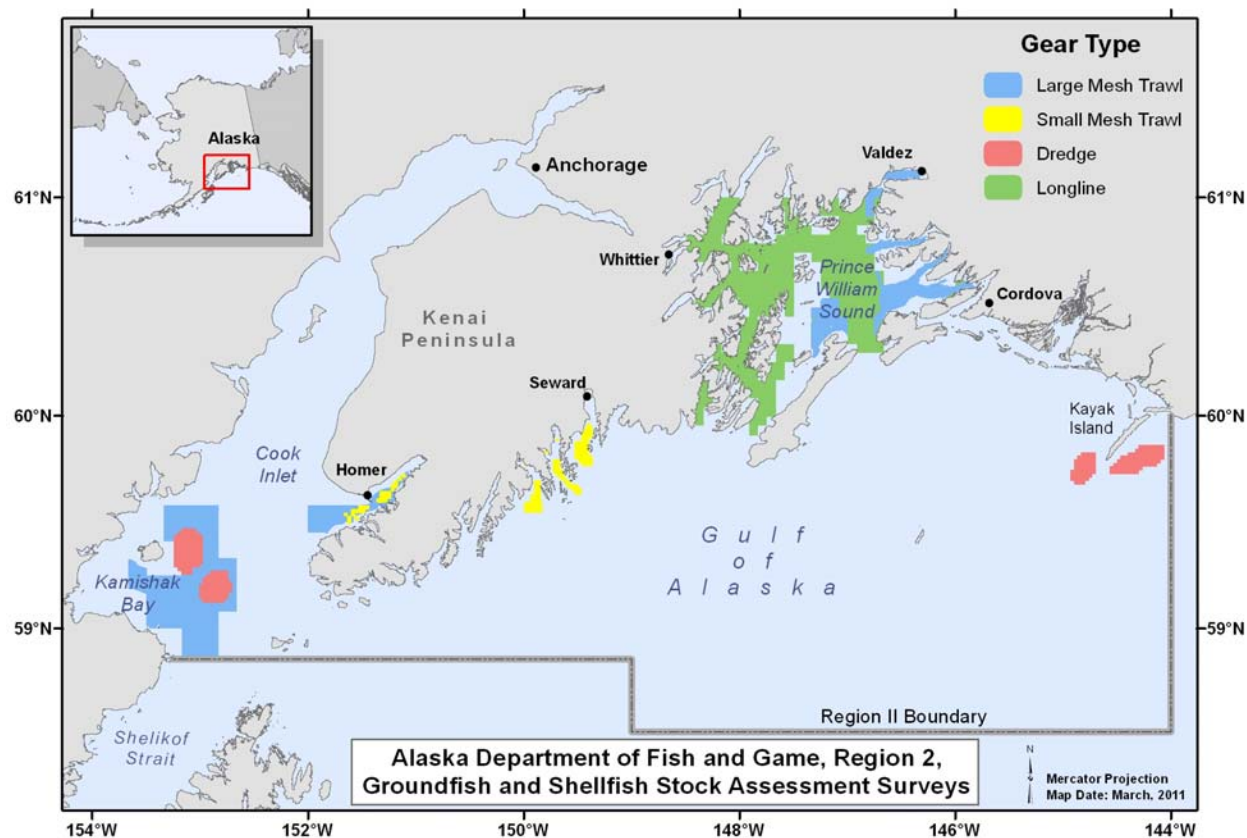
- Surface temperature
- Temperature at depth

Key citation for methodology

Bechtol, W. R., R. L. Gustafson and T.R. Kerns. 2009. A survey of weathervane scallops in Kamishak Bay, 2003. Alaska department of Fish and Game Fishery data Series No. 09-24, Anchorage

Gustafson, R.L. and K.J. Goldman. 2008. Central Region Weathervane Scallop Assessment. Final Comprehensive Progress Report. NOAA FMP Extended Jurisdiction Program, 16p. Federally funded under NOAA Grant # NA04NMF4370176 for 07/01/04 – 06/30/08

6.6.3. Figure



6.7. NORTH SOUTHEAST INSIDE (CHATHAM) SABLEFISH LONGLINE SURVEY

6.7.1. Presentation: ADFG_Southeast_Longline.ppt

6.7.2. Summary

Person completing the template

- Kamala Carroll, (w) 907-747-6701, (c) 907-738-1342, kamala.carroll@alaska.gov

General location

- Southeast Alaska inside waters

Depth range

- 370-815m

Year survey initiated

- 1981 non-standardised
- annual surveys in 1988

Years conducted

- 1981, 1985, 1986 non-standardised
- 1988-1996 using commercial and state vessels
- 1997 with current stations

Planned frequency

- annual

Time of year conducted

- July-August, prior to Fishery opening August 15th

Government or charter vessel

- 3 commercial charter vessels

Agency responsible

- ADFG

Current project leader

- Mike Vaughn, 907-747-3981, mike.vaughn@alaska.gov

Contact person for data and/or results

- Mike Vaughn, 907-747-3981, mike.vaughn@alaska.gov

Principal sampling gear

- Longline-hook and line

Number of stations/sets/tows

- ~44 stations

Principal data collected from above

- Enumerate, to the lowest possible taxonomic group, all fish captured
- Collect a representative sample of biological data of sablefish and rockfishes and thornyheads for length, weight, sex, otoliths, and gonad maturity

Statistical design

- Stratified random

Other gear or sampling methods used in survey

- Identify and count seabirds for NOAA Fisheries

Oceanographic data collected

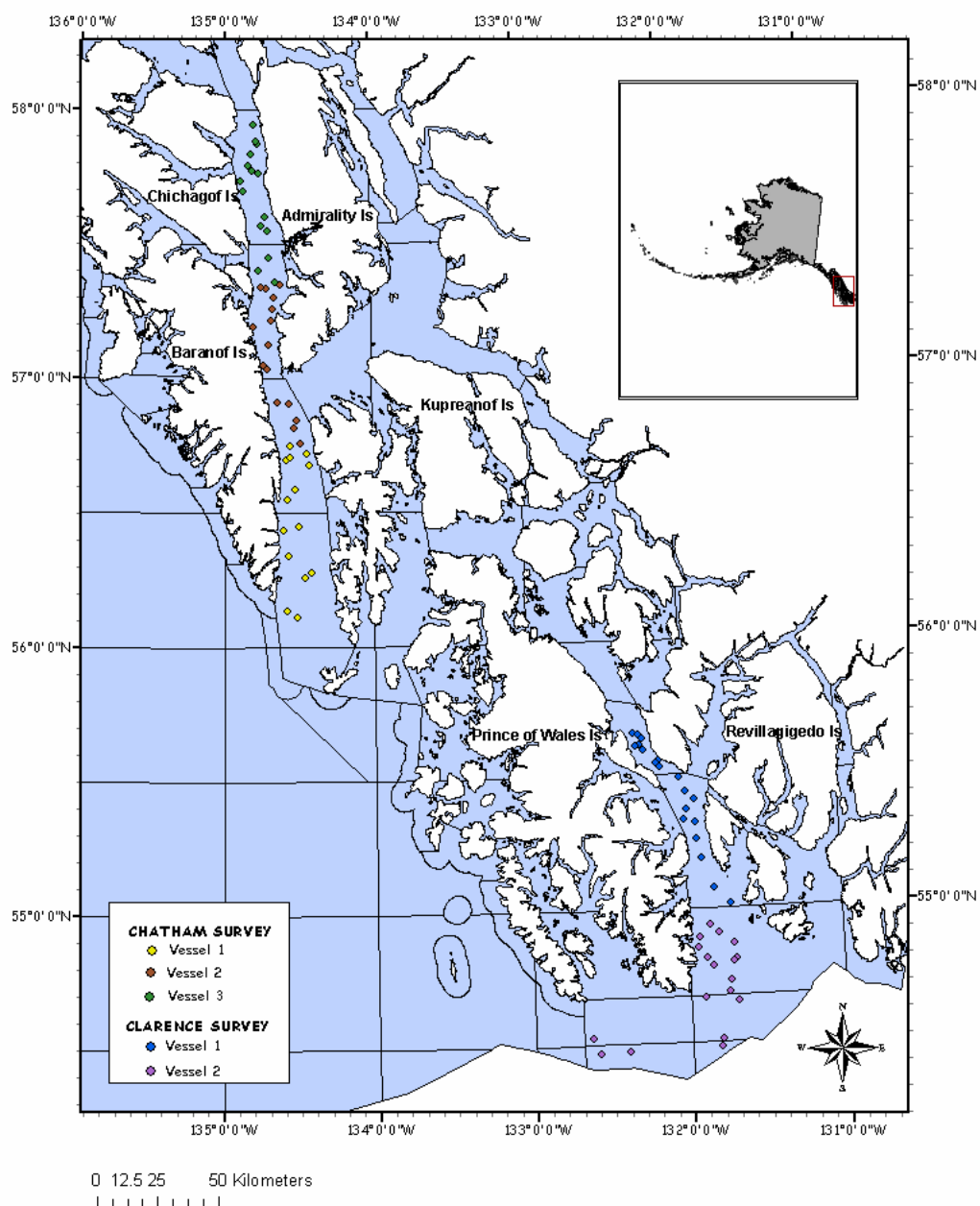
- Station begin and end depths

Key citation for methodology

Bracken, B. E., D. A. Gordon, and D. W. Carlile. 1997. Sablefish, *Anoplopoma fimbria*, stock assessment in the inside waters of Southeast Alaska. In Proceedings of the international symposium on the biology and management of sablefish, Wilkins, M. E., and Saunders, M. W., eds. Seattle, Washington. NOAA Technical Report NMFS 130. pp. 195–206

6.7.3. Figure

ADFG Sablefish Survey Stations



6.8. SOUTH SOUTHEAST INSIDE (CLARENCE) SABLEFISH LONGLINE SURVEY

6.8.1. Presentation: ADFG_Southeast_Longline.ppt

6.8.2. Summary

Person completing the template

- Kamala Carroll, (w) 907-747-6701, (c) 907-738-1342, kamala.carroll@alaska.gov

General location

- Southeast Alaska inside waters

Depth range

- 340-740m

Year survey initiated

- 1988, 1997 with current stations

Years conducted

- 1988-2004, 2006-2010

Planned frequency

- annual

Time of year conducted

- May prior to Fishery opening June 1st

Government or charter vessel

- 2 commercial charter vessels

Agency responsible

- ADFG

Current project leader

- Kamala Carroll, (w) 907-747-6701, (c) 907-738-1342, kamala.carroll@alaska.gov

Contact person for data and/or results

- Kamala Carroll, (w) 907-747-6701, (c) 907-738-1342, kamala.carroll@alaska.gov

Principal sampling gear

- longline-hook and line

Number of stations/sets/tows

- 37 stations

Principal data collected from above

- Enumerate, to the lowest possible taxonomic group, all fish captured
- Collect a representative sample of biological data of sablefish and seabastes for length, sex, weight, otoliths, and gonad maturity

Statistical design

- stratified random

Other gear or sampling methods used in survey

- Identify and count seabirds for NMFS

Oceanographic data collected

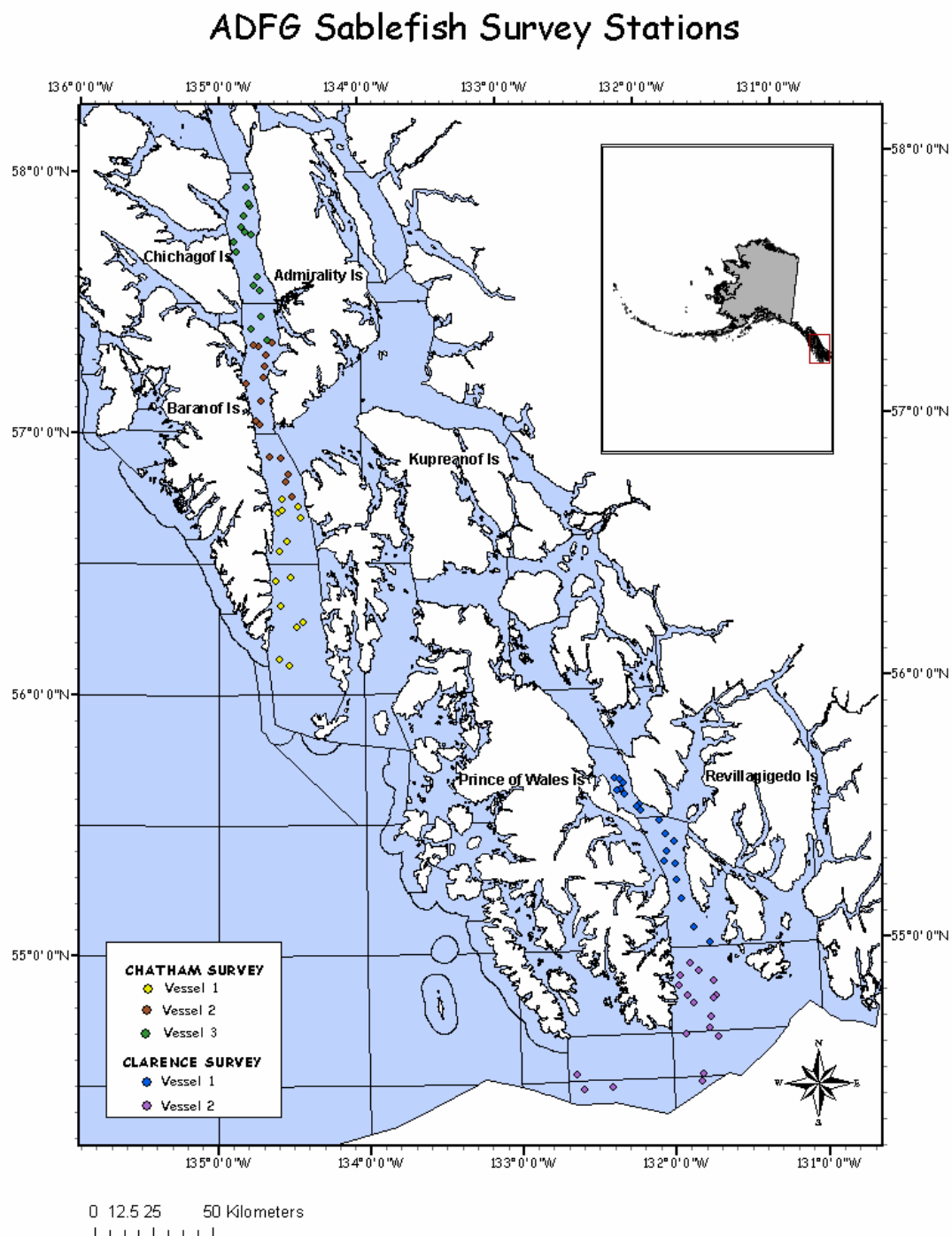
- Station begin and end depths

Key citation for methodology

Bracken, B. E., D. A. Gordon, and D. W. Carlile. 1997. Sablefish, *Anoplopoma fimbria*, stock assessment in the inside waters of Southeast Alaska. In Proceedings of the

international symposium on the biology and management of sablefish, Wilkins, M. E., and Saunders, M. W., eds. Seattle, Washington. NOAA Technical Report NMFS 130. pp. 195–206

6.8.3. Figure



7. STATE, WASHINGTON

7.1. WASHINGTON DEPARTMENT OF FISH AND WILDLIFE BOTTOM TRAWL SURVEY OF PUGET SOUND

7.1.1. Presentation: WDFL_Puget_Sound.ppt

7.1.2. Summary

Person completing the template

- Wayne Palsson

General location

- Puget Sound, west of the Sekiu River

Depth range

- >9 m

Year survey initiated

- 1987

Years conducted

- 1987-2010, and erratic or then regular interval

Planned frequency

- Every year since 2008

Time of year conducted

- April to June

Government or charter vessel

- charter, FV Chasina since 1992

Agency responsible

- Washington Department of Fish and Wildlife

Current project leader

- Wayne Palsson
- After June 2011, Bob Pacunski, 425-379-2314, Bob.Pacunski@dfw.wa.gov

Contact person for data and/or results

- Wayne Palsson
- After June 2011, Bob Pacunski, 425-379-2314, Bob.Pacunski@dfw.wa.gov

Principal sampling gear

- 400 mesh Eastern Bottom Trawl

Number of stations/sets/tows

- 51, each sampled twice

Principal data collected from above

- Weights and number of catches sorted to fish and invertebrates species (as much as possible)
- selected specimens sampled for length, sex, weight, ageing parts, genetics

Statistical design

- Currently fixed index stations stratified by depth in 8 basins of Puget Sound; previously stratified by depth and random or systematic

Other gear or sampling methods used in survey

- catches of man-made debris
- catches of marine vegetation

Oceanographic data collected

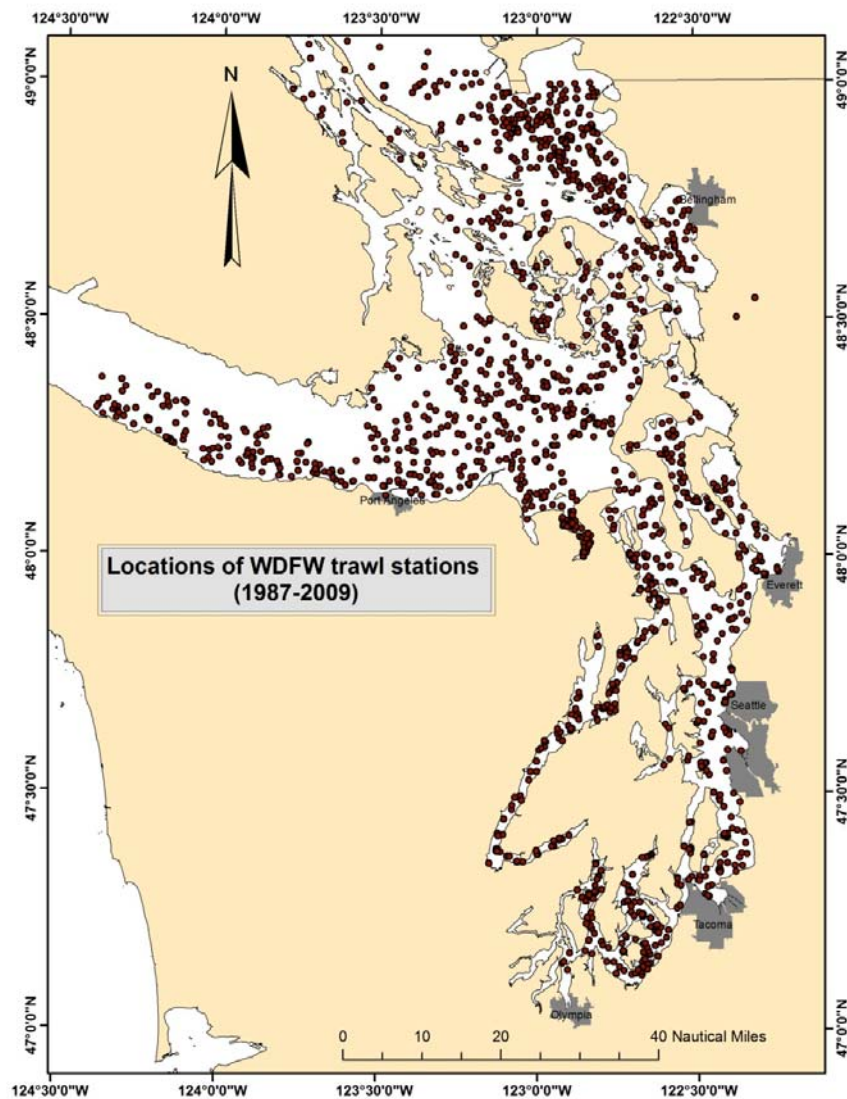
- CTD casts for temperature, salinity/conductivity, depth, oxygen, pH

Key citation for methodology

Palsson, W.A., S. Hoffmann, P. Clarke, and J. Beam. 2003. Results from the 2001 transboundary trawl survey of the southern Strait of Georgia, San Juan Archipelago, and adjacent waters. Wash. Dept. Fish and Wildlife Report No. FPT 03-09, 109 p

Palsson, W.A., P. Clarke, S. Hoffmann, and J. Beam. 2002. Results from the 2000 transboundary trawl survey of the eastern Strait of Juan de Fuca and Discovery Bay. Wash. Dept. Fish and Wildlife Report No. FPT 03-08, 76 p

7.1.3. Figure



8. STATE, MAINE

8.1. MAINE-NEW HAMPSHIRE INSHORE TRAWL SURVEY

8.1.1. Presentation: MDMR_Inshore_Trawl.ppt

8.1.2. Summary

Person completing the template

- Sally Sherman, 207-633-9503, sally.sherman@maine.gov, Maine Department of Marine Resources, P.O. Box 8 194 McKown Point Road, West Boothbay Harbor, ME 04575

General location

- near shore Gulf of Maine, from New Hampshire/Massachusetts border to US/Canadian border
- outer boundary is approximately the US 12-mile limit

Depth range

- 6-180 m

Year survey initiated

- 2000

Years conducted

- 2000-2011

Planned frequency

- semi-annual survey, conducted spring and fall

Time of year conducted

- May/June and Oct/Nov

Government or charter vessel

- charter, currently F/V Robert Michael

Agency responsible

- Maine Department of Marine Resources

Current project leader

- Sally Sherman, 207-633-9503, sally.sherman@maine.gov

Contact person for data and/or results

- Sally Sherman, 207-633-9503, sally.sherman@maine.gov
- Keri Stepanek, 207-633-9530 keri.stepanek@maine.gov

Principal sampling gear

- modified shrimp bottom trawl, 20 minute tows at 2.5 knots

Number of stations/sets/tows

- ~120

Principal data collected from above

- catches sorted to fish and invertebrates species
- lengths on all finfish and selected invertebrates (lobster, shrimp, scallop)
- selected finfish specimens sampled for length, sex, weight, maturity stage, ageing parts, food habits, and genetics

Statistical design

- stratified random with a fixed component (one fixed station per stratum)

Other gear or sampling methods used in survey

- NetMind TM net mensuration data on every tow
- Ichthyoplankton data collected for a few springs (discontinued in 2006)
- Oceanographic data collected
- Wind direction and speed
- Wave height

Cloud cover

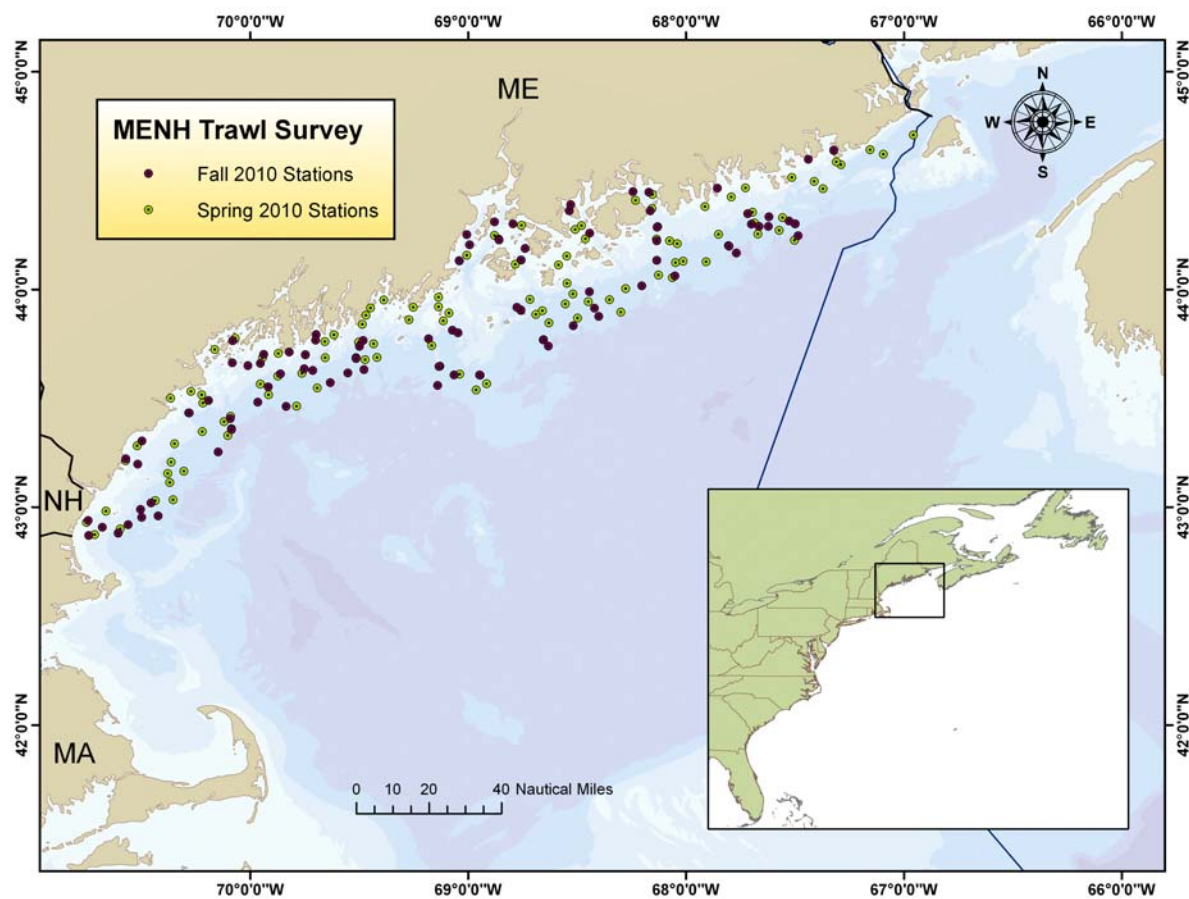
- CTD casts for temperature, salinity/conductivity, depth

Key citation for methodology

MENH Inshore Groundfish Trawl Survey Procedures and Protocols, Sally Sherman, Keri Stepanek, and John Sowles, 2005, MEDMR Research Reference Document 05/01, www.maine.gov/dmr/rm/rawl/reports.htm

Maine-New Hampshire Survey Trawl Reference Manual, 2008, Marine Institute Centre for Sustainable Aquatic Resources, Memorial University, St. John's, Newfoundland, CA, available upon request

8.1.3. Figure



9. STATE, ATLANTIC STATES MARINE FISHERIES COMMISSION

9.1. NORTH EAST AREA MONITORING AND ASSESSMENT PROGRAM (NEAMAP)

9.1.1. Presentation: VIMS_Surveys.ppt

9.1.2. Summary

Person completing the template

- Chris Bonzek, (w) 804-684-7291 (c) 804-815-2111, cfb@vims.edu

General location

- near coastal waters between Cape Cod, MA and Cape Hatteras, NC

Depth range

- 6.1m – 18.3m between Montauk, NY and Cape Hatteras, NC
- 18.3m – 36.6m in Rhode Island and Block Island Sounds

Year survey initiated

- 2007

Years conducted

- 2007 - present

Planned frequency

- twice yearly

Time of year conducted

- spring survey: ~20 April – 20 May
- fall survey: ~20 September – late October

Government or charter vessel

- charter

Agency responsible

- designed by Atlantic States Marine Fisheries Commission
- funded (primarily) by Mid-Atlantic Fisheries Management Council
- conducted by Virginia Institute of Marine Science

Current project leader

- Chris Bonzek, (w) 804-684-7291 (c) 804-815-2111, cfb@vims.edu
- James Gartland, (w) 804-684-7546 (c) 804-815-7791, jgartlan@vims.edu

Contact person for data and/or results

- Chris Bonzek, (w) 804-684-7291 (c) 804-815-2111, cfb@vims.edu
- James Gartland, (w) 804-684-7546 (c) 804-815-7791, jgartlan@vims.edu

Principal sampling gear

- 400 x 12cm 4-seam 3-bridle bottom trawl with 3” cookie sweep, and 1” knotless liner

Number of stations/sets/tows

- 150

Principal data collected from above

- all specimens sorted to species and modal size group
- non-managed species
- gross weight and individual lengths (subsampled as necessary) within each modal size group

- managed species
- a subsample within each modal size group is selected for individual length-weight-sex-maturity stage-ageing parts-stomach; specimens not selected for the subsample are processed using the same methods as for non-managed species
- additional data taken for some species (e.g. tags on sturgeon, pup lengths and weights for dogfish)
- additional length-weight-sex measurements (up to 15 per modal size group) are recorded for species with known sexually dimorphic growth
- some invertebrates are either only weighed or counted as appropriate; for managed invertebrates, at a minimum, aggregate weight and individual lengths are recorded

Statistical design

- stratified random by longitudinal or latitudinal region and depth (34 strata)

Other gear or sampling methods used in survey

- future plans for Roxann and flowmeter recordation

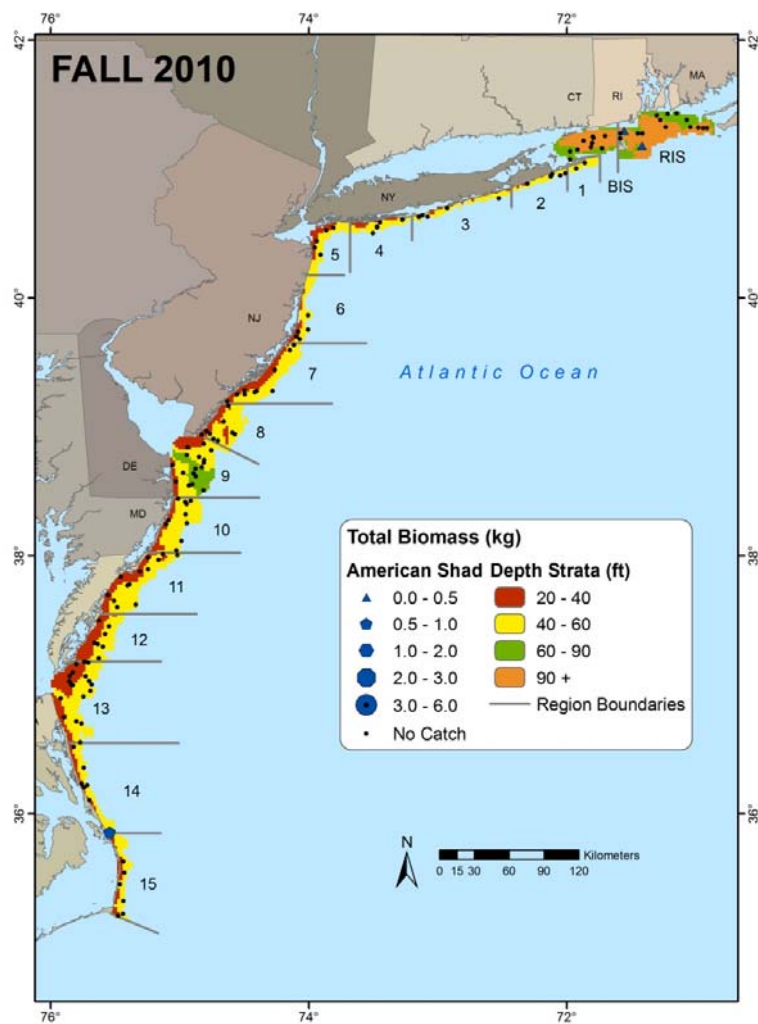
Oceanographic data collected

- temperature, salinity, D.O. at 1m, 2m, at 2m intervals, and at bottom
- atmospheric, weather, and sea state

Key citation for methodology

[http://www.neamap.net/publications/ASMFC_NEAMAP_Final%20Report_2005_2009.p
df](http://www.neamap.net/publications/ASMFC_NEAMAP_Final%20Report_2005_2009.pdf)

9.1.3. Figure



10. DFO, PACIFIC REGION

10.1. WEST COAST HAIDA GWAII MULTI-SPECIES GROUND FISH BOTTOM TRAWL SURVEY

10.1.1. Presentation: DFO_Pacific_Surveys.ppt

10.1.2. Summary

Person completing the template

- Malcolm Wyeth, 250-756-7300, Malcolm.Wyeth@dfo-mpo.gc.ca

General location

- Northern British Columbia (west coast of Haida Gwaii (formerly Queen Charlotte Islands))

Depth range

- 200-1300m

Year survey initiated

- 2006

Years conducted

- 2006, 2007, 2008, 2010

Planned frequency

- every 2 years in even-numbered years

Time of year conducted

- late August to late September

Government or charter vessel

- currently charter vessel

Agency responsible

- DFO/ MEAD/ Groundfish section

Current project leader

- Rick Stanley, 250-756-7134, Rick.Stanley@dfo-mpo.gc.ca

Contact person for data and/or results

- Kate Rutherford, 250-756-7171, Kate.Rutherford@dfo-mpo.gc.ca

Principal sampling gear

- bottom trawl

Number of stations/sets/tows

- target of 125 tows, visit ~150 stations

Principal data collected from above

- catches sorted to fish and invertebrates species (as much as possible)
- selected specimens sampled for length, sex, visual maturity, weight, ageing structures, genetics

Statistical design

- stratified random

Other gear or sampling methods used in survey

- net mensuration (door spread, wingtip spread, headrope depth and height) and bottom contact sensor

Oceanographic data collected

- net-mounted TDR (temperature-depth recorder)
- net-mounted CTD (conductivity, temperature, depth) with dissolved oxygen and pH

Key citation for methodology

Workman G.D., Olsen, N., and Rutherford, K.L. 2007. West Coast Queen Charlotte Islands groundfish bottom trawl survey, August 28th to September 25th, 2006. Can. Manuscr. Rep. Fish. Aquat. Sci. 2804: vii + 44p

10.1.3. Figure



10.2. HECATE STRAIT MULTI-SPECIES GROUND FISH BOTTOM TRAWL SURVEY

10.2.1. Presentation: DFO_Pacific_Surveys.ppt

10.2.2. Summary

Person completing the template

- Malcolm Wyeth, 250-756-7300, Malcolm.Wyeth@dfo-mpo.gc.ca

General location

- Northern British Columbia inside waters (Hecate Strait)

Depth range

- 10-500m

Year survey initiated

- 2005

Years conducted

- 2005, 2007, 2009, 2011

Planned frequency

- every 2 years in odd-numbered years

Time of year conducted

- late May to late June

Government or charter vessel

- government, currently W.E. Ricker

Agency responsible

- DFO/ MEAD/ Groundfish section

Current project leader

- Rick Stanley, 250-756-7134, Rick.Stanley@dfo-mpo.gc.ca

Contact person for data and/or results

- Kate Rutherford, 250-756-7171, Kate.Rutherford@dfo-mpo.gc.ca

Principal sampling gear

- bottom trawl

Number of stations/sets/tows

- target of 160 tows, visit ~220 stations

Principal data collected from above

- catches sorted to fish and invertebrates species (as much as possible)
- selected specimens sampled for length, sex, visual maturity, weight, ageing structures, genetics

Statistical design

- stratified random

Other gear or sampling methods used in survey

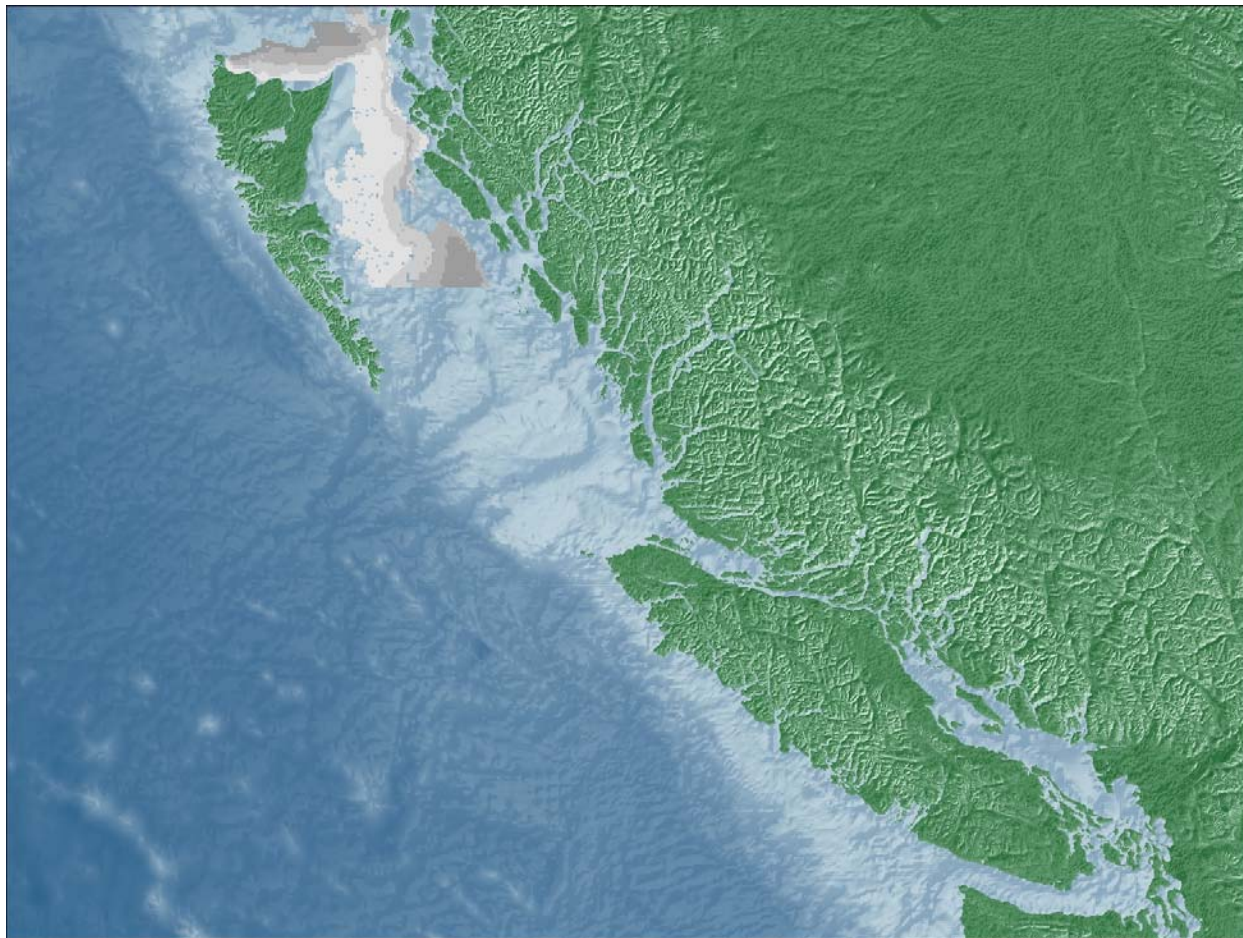
- net mensuration (door spread, wingtip spread, headrope depth and height) and bottom contact sensor

Oceanographic data collected

- net-mounted TDR (temperature-depth recorder)
- net-mounted CTD (conductivity, temperature, depth) with dissolved oxygen and pH
- surface temperature and salinity (shipboard thermosalinograph)

Key citation for methodology

Workman G.D., Rutherford, K.L. and Olsen, N.2008.Hecate Strait groundfish bottom trawl survey, May 25th to June 29th, 2005.Can. Manuscr. Rep. Fish. Aquat. Sci. 2805: vi + 53 p

10.2.3.Figure

10.3. QUEEN CHARLOTTE SOUND MULTI-SPECIES GROUND FISH BOTTOM TRAWL SURVEY

10.3.1. Presentation: DFO_Pacific_Surveys.ppt

10.3.2. Summary

Person completing the template

- Malcolm Wyeth, 250-756-7300, Malcolm.Wyeth@dfo-mpo.gc.ca

General location

- central British Columbia (Queen Charlotte Sound)

Depth range

- 50-500m

Year survey initiated

- 2003

Years conducted

- 2003-2005, 2007, 2009, 2011

Planned frequency

- every 2 years in odd-numbered years

Time of year conducted

- early July to early August

Government or charter vessel

- currently charter vessel

Agency responsible

- DFO/ MEAD/ Groundfish section

Current project leader

- Rick Stanley, 250-756-7134, Rick.Stanley@dfo-mpo.gc.ca

Contact person for data and/or results

- Kate Rutherford, 250-756-7171, Kate.Rutherford@dfo-mpo.gc.ca

Principal sampling gear

- bottom trawl

Number of stations/sets/tows

- target of 240 tows, visit ~300 stations

Principal data collected from above

- catches sorted to fish and invertebrates species (as much as possible)
- selected specimens sampled for length, sex, visual maturity, weight, ageing structures, genetics

Statistical design

- stratified random

Other gear or sampling methods used in survey

- net mensuration (door spread, wingtip spread, headrope depth and height) and bottom contact sensor

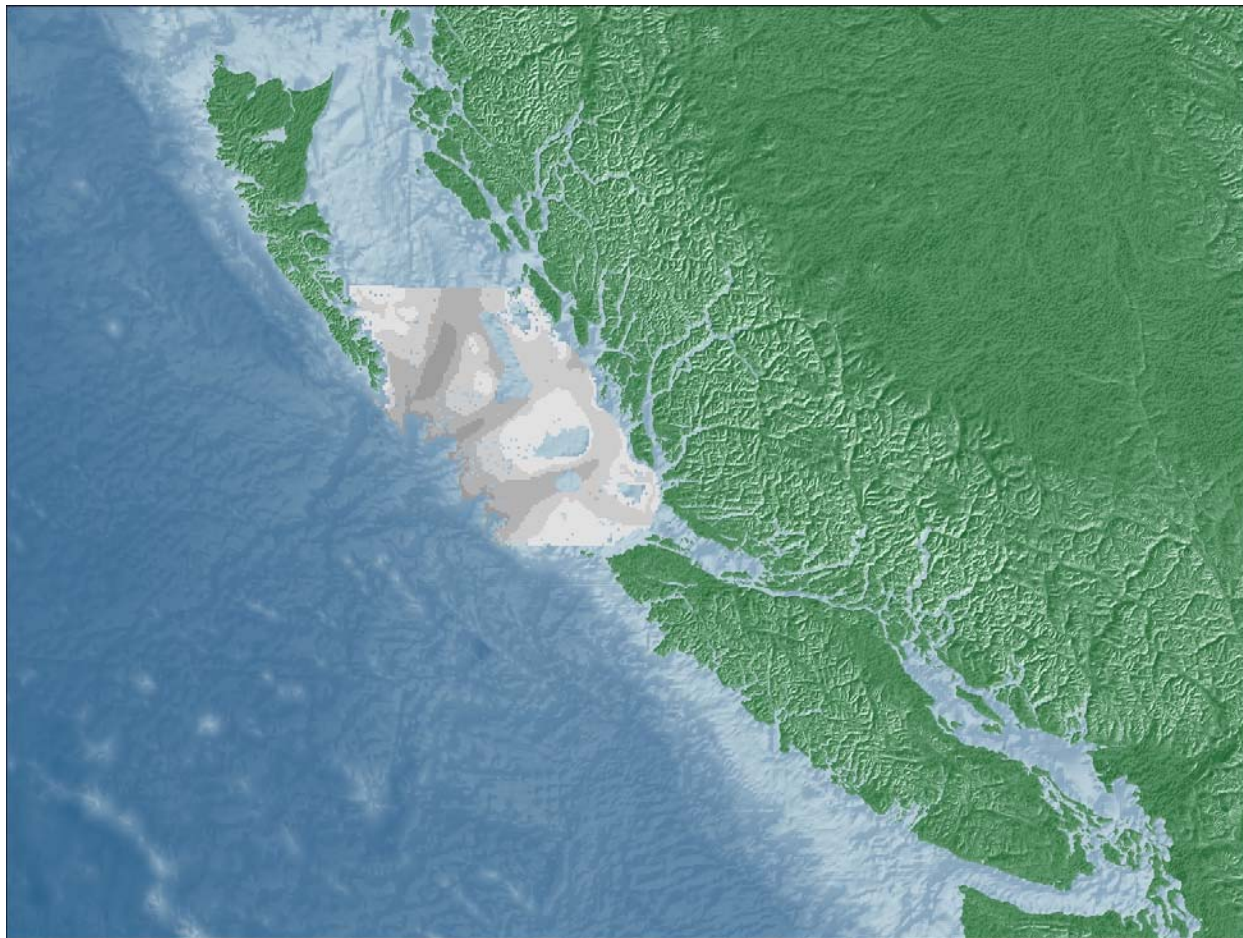
Oceanographic data collected

- net-mounted TDR (temperature-depth recorder)
- net-mounted CTD (conductivity, temperature, depth) with dissolved oxygen and pH

Key citation for methodology

Olsen, N., Workman, G.D., and Stanley, R.D. 2007. Queen Charlotte Sound Groundfish Bottom Trawl Survey July 3rd to August 10th, 2003. Can. Manuscr. Rep. Fish. Aquat. Sci. 2782: 58p

10.3.3. Figure



10.4. WEST COAST VANCOUVER ISLAND MULTI-SPECIES GROUND FISH BOTTOM TRAWL SURVEY

10.4.1.Presentation: DFO_Pacific_Surveys.ppt

10.4.2.Summary

Person completing the template

- Malcolm Wyeth, 250-756-7300, Malcolm.Wyeth@dfo-mpo.gc.ca

General location

- southern British Columbia (west coast of Vancouver Island)

Depth range

- 50-500m

Year survey initiated

- 2004

Years conducted

- 2004, 2006, 2008, 2010

Planned frequency

- every 2 years in even-numbered years

Time of year conducted

- late May to late June

Government or charter vessel

- government, currently W.E. Ricker

Agency responsible

- DFO/ MEAD/ Groundfish section

Current project leader

- Rick Stanley, 250-756-7134, Rick.Stanley@dfo-mpo.gc.ca

Contact person for data and/or results

- Kate Rutherford, 250-756-7171, Kate.Rutherford@dfo-mpo.gc.ca

Principal sampling gear

- bottom trawl

Number of stations/sets/tows

- target of 160 tows, visit ~220 stations

Principal data collected from above

- catches sorted to fish and invertebrates species (as much as possible)
- selected specimens sampled for length, sex, visual maturity, weight, ageing structures, genetics

Statistical design

- stratified random

Other gear or sampling methods used in survey

- net mensuration (door spread, wingtip spread, headrope depth and height) and bottom contact sensor

Oceanographic data collected

- net-mounted TDR (temperature-depth recorder)
- net-mounted CTD (conductivity, temperature, depth) with dissolved oxygen and pH

- surface temperature and salinity (shipboard thermosalinograph)

Key citation for methodology

Workman G.D., Olsen, N., Fargo, J., and Stanley, R.D. 2008. West Coast Vancouver Island groundfish bottom trawl survey, R/V W.E. RICKER, May 25th to June 10th, 2004. Can. Manuscr. Rep. Fish. Aquat. Sci. 2826: viii + 64p

10.4.3. Figure



10.5. MULTI-SPECIES SMALL MESH (SHRIMP) BOTTOM TRAWL SURVEY

10.5.1. Presentation: DFO_Pacific_Surveys.ppt

10.5.2. Summary

Person completing the template

- Malcolm Wyeth, 250-756-7300, Malcolm.Wyeth@dfo-mpo.gc.ca

General location

- southern British Columbia, west coast of Vancouver Island (WCVI); central British Columbia, Queen Charlotte Sound (QCS)

Depth range

- 50-200m

Year survey initiated

- 1973 (WCVI) and 1998 (QCS), groundfish involvement 2003

Years conducted

- 1973 (1998) to present

Planned frequency

- annually

Time of year conducted

- late April to late May

Government or charter vessel

- government, currently W.E. Ricker

Agency responsible

- DFO/ MEAD/ Shellfish section

Current project leader

- Dennis Rutherford, 250-756-7174, dennis.rutherford@dfo-mpo.gc.ca

Contact person for data and/or results

- For invertebrate data
- Leslie Barton, 250-756-7306, leslie.barton@dfo-mpo.gc.ca
- For groundfish data
- Kate Rutherford, 250-756-7171, kate.rutherford@dfo-mpo.gc.ca

Principal sampling gear

- small mesh (shrimp) otter bottom trawl

Number of stations/sets/tows

- 190

Principal data collected from above

- catches sorted to fish and invertebrate species
- biological data collected from selected shrimp species and eulachon
- since 2003, selected groundfish sampled for length, sex, visual maturity, weight, ageing structures, genetics

Statistical design

- fixed station (regular grid) within selected shrimp management areas

Key citation for methodology

Boutillier J.A., J.A. Bond, and H. Nguyen 1999. Evaluation of a new assessment and management framework for shrimp stocks in British Columbia. Canadian Stock Assessment Secretariat Res Doc. 99/124

10.5.3. Figure



10.6. PACIFIC HAKE ACOUSTIC SURVEY

10.6.1. Presentation: DFO_Pacific_Surveys.ppt

10.6.2. Summary

Person completing the template

- Chris Grandin, 250-756-7170, chris.grandin@dfo-mpo.gc.ca

General location

- British Columbia Coastwide, Hecate Strait, Queen Charlotte Sound, Dixon Entrance

Depth range

- 50-1500m

Year survey initiated

- 1995

Years conducted

- 1995, 1998, 2001, 2003, 2005, 2007, 2009

Planned frequency

- every 2 years

Time of year conducted

- August-September

Government or charter vessel

- government, currently W.E. Ricker

Agency responsible

- DFO/ MEAD/ Groundfish section
- NOAA/ NMFS

Current project leader

- Chris Grandin, 250-756-7170, chris.grandin@dfo-mpo.gc.ca

Contact person for data and/or results

- Chris Grandin, 250-756-7170, chris.grandin@dfo-mpo.gc.ca

Principal sampling gear

- midwater trawl

Number of stations/sets/tows

- ~ 60

Principal data collected from above

- catches sorted by species
- selected specimens (Hake only) sampled for length, sex, weight, ageing parts, genetics

Statistical design

- Transects are 10nmi apart with the starting transect defined by a random seed and each following based on the first
- Opportunistic ground-truthing trawls based on acoustic echograms

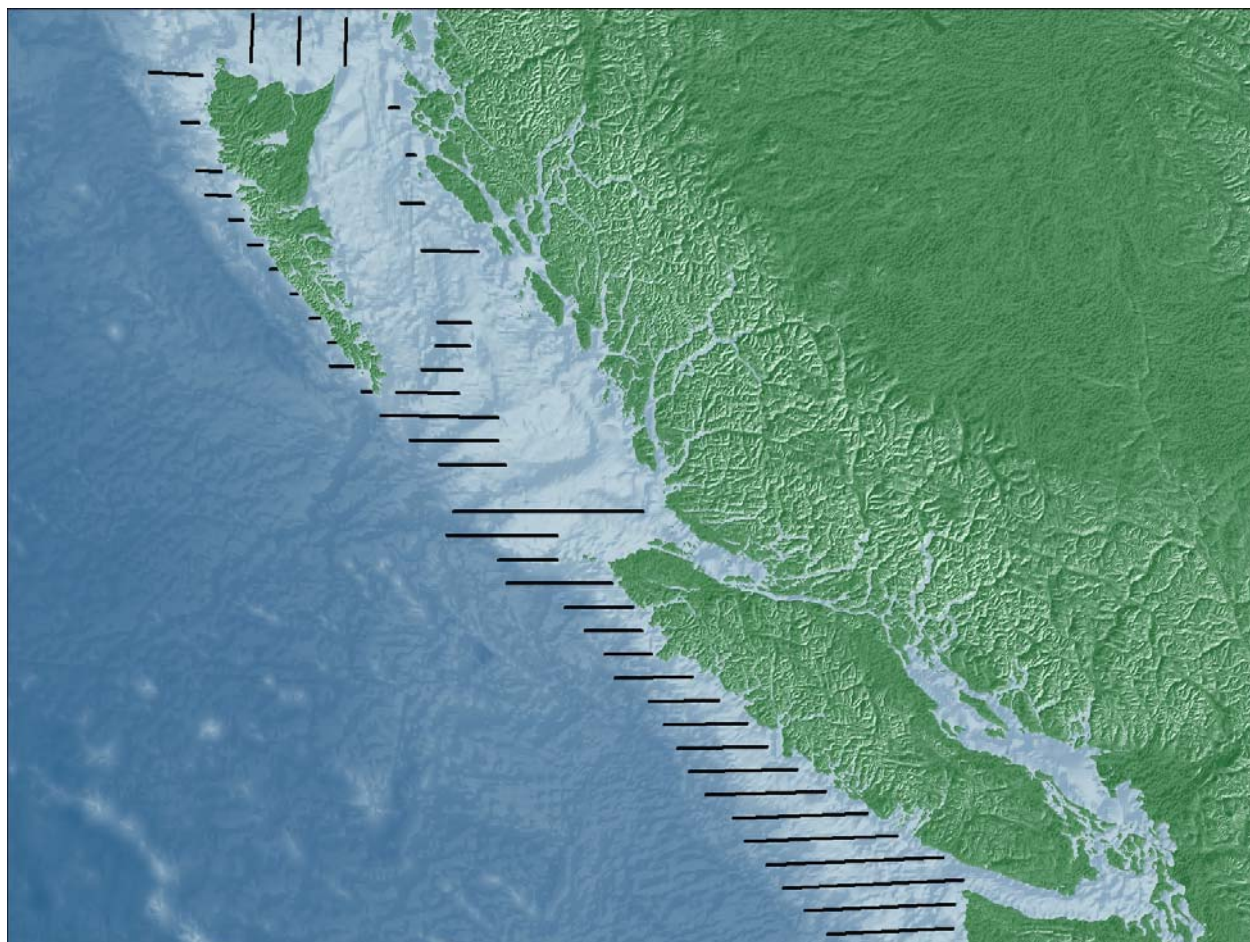
Other gear or sampling methods used in survey

- Acoustic data - 38kHz, 120kHz recorded on predefined transects

Oceanographic data collected

- CTD (conductivity, temperature, depth) casts, typically one per transect

10.6.3. Figure



10.7. INSHORE ROCKFISH PACIFIC HALIBUT MANAGEMENT ASSOCIATION (PHMA) OUTSIDE LONGLINE HOOK SURVEY

10.7.1.Presentation: DFO_Pacific_Surveys.ppt

10.7.2.Summary

Person completing the template

- K. Lynne Yamanaka, 250-756-7211, Lynne.Yamanaka@dfo-mpo.gc.ca

General location

- British Columbia outside waters (excluding inside waters between Vancouver Island and the mainland)

Depth range

- 20-250m

Year survey initiated

- 2006

Years conducted

- 2006, 2007, 2008, 2009, 2010

Planned frequency

- annual, covering ½ of the coast, alternating between north (even-numbered years) and south (odd-numbered years)

Time of year conducted

- August 1 to September 15

Government or charter vessel

- chartered commercial halibut fishing vessels

Agency responsible

- DFO/ MEAD/ Groundfish section
- PHMA

Current project leader

- K. Lynne Yamanaka, 250-756-7211, Lynne.Yamanaka@dfo-mpo.gc.ca

Contact person for data and/or results

- K. Lynne Yamanaka, 250-756-7211, Lynne.Yamanaka@dfo-mpo.gc.ca

Principal sampling gear

- demersal longline hook

Number of stations/sets/tows

- ~200 annually

Principal data collected from above

- hook by hook catch composition to species (as much as possible)
- catch sorted to species and weighed
- selected specimens sampled for length, sex, weight, ageing parts, genetics

Statistical design

- stratified random over hard bottom areas

Other gear or sampling methods used in survey

- marine mammal and bird sightings (opportunistic)

Oceanographic data collected

- longline mounted TDR (temperature depth recorder)

10.7.3.Figure



10.8. INSHORE ROCKFISH DFO INSIDE LONGLINE HOOK SURVEY

10.8.1.Presentation: DFO_Pacific_Surveys.ppt

10.8.2.Summary

Person completing the template

- K. Lynne Yamanaka, 250-756-7211, Lynne.Yamanaka@dfo-mpo.gc.ca

General location

- British Columbia inside waters (between Vancouver Island and the mainland)

Depth range

- 40-100m

Year survey initiated

- 2003

Years conducted

- 2003, 2004, 2005, 2007, 2008, 2009, 2010

Planned frequency

- annual, covering ½ to 1/3 of the area, (2006 missed)

Time of year conducted

- August

Government or charter vessel

- government, currently Neocaligus

Agency responsible

- DFO/ MEAD/ Groundfish section

Current project leader

- K. Lynne Yamanaka, 250-756-7211, Lynne.Yamanaka@dfo-mpo.gc.ca

Contact person for data and/or results

- K. Lynne Yamanaka, 250-756-7211, Lynne.Yamanaka@dfo-mpo.gc.ca

Principal sampling gear

- demersal longline hook

Number of stations/sets/tows

- ~70 annually

Principal data collected from above

- hook by hook catch composition to species (as much as possible)
- catch sorted to species and weighed
- selected specimens sampled for length, sex, weight, ageing parts, genetics

Statistical design

- stratified random

Other gear or sampling methods used in survey

- marine mammal and bird sightings (opportunistic)

Oceanographic data collected

- longline mounted TDR

Key citation for methodology

Lohead, J.K., and Yamanaka, K.L.2004.A new longline survey to index inshore rockfish (Sebastes spp.): summary report on the pilot survey conducted in Statistical Areas 12 and 13, August 17 – September 6, 2003.Can Tech Rep. Fish Aquat. Sci. 2567: ix + 59 p

Lohead, J.K. and Yamanaka, K.L.2006.Summary report for the inshore rockfish (Sebastes spp.) longline survey conducted in Statistical Areas 12 and 13, August 24 – September 10, 2004.Can. Tech. Rep. Fish. Aquat. Sci. 2627: x + 65 p

Lohead, J.K., and Yamanaka, K.L.2007.Summary report for the inshore rockfish (Sebastes spp.) longline survey conducted in Statistical Areas 14 to 20, 28 and 29, from August 11 to September 6, 2005.Can. Tech. Rep. Fish. Aquat. Sci. 2690: ix + 53 p

10.8.3. Figure



10.9. STRAIT OF GEORGIA SPINY DOGFISH LONGLINE HOOK SURVEY

10.9.1.Presentation: DFO_Pacific_Surveys.ppt

10.9.2.Summary

Person completing the template

- Jackie King; (250)756-7176; Jackie.King@dfo-mpo.gc.ca

General location

- British Columbia inside waters; Strait of Georgia

Depth range

- 0-250 m

Year survey initiated

- 1986

Years conducted

- 1986, 1989, 2005, 2008

Planned frequency

- every 3 years

Time of year conducted

- October

Vessel

- Government, currently Neocaligus

Agency responsible

- DFO/ MEAD/ Groundfish section

Current project leader

- Jackie King; (250)756-7176; Jackie.King@dfo-mpo.gc.ca

Contact person for data and/or results

- Jackie King; (250)756-7176; Jackie.King@dfo-mpo.gc.ca

Principal sampling gear

- bottom longline hook

Number of stations/sets/tows

- 10 sites, 5 sets per site

Principal data collected from above

- catches sorted to fish
- selected specimens sampled for length, sex, weight, ageing parts, genetics

Statistical design

- fixed station index sites
- depth stratified

Key citation for methodology

King, J.R., and McFarlane, G.A. 2009. Biological results of the Strait of Georgia spiny dogfish (*Squalus Acanthias*) longline survey October 10-22, 2008. Can. Data Rep. Fish. Aquat. Sci. 1220: iii + 27 p

10.9.3. Figure



10.10. SABLEFISH LONGLINE TRAP SURVEY

10.10.1. Presentation: DFO_Pacific_Surveys.ppt

10.10.2. Summary

Person completing the template

- Malcolm Wyeth, 250-756-7300, Malcolm.Wyeth@dfo-mpo.gc.ca

General location

- offshore British Columbia coast wide; northern and central British Columbia inlets

Depth range

- Standardized Program: 275-1200 m (150-650 fm)
- Randomized Program: 180 – 1375 m (100-750 fm)
- Inlets Program: 400-800 m

Year survey initiated

- Standardized Program: 1990
- Randomized Program: 2003
- Inlets Program: 1994

Years conducted

- Standardized Program: 1990-2010
- Randomized Program: 2003-2010
- Inlets Program: 1994 - 2010

Planned frequency

- Standardized Program: no plan to continue
- Randomized Program: annual
- Inlets Program: annual

Time of year conducted

- October to mid November

Government or charter vessel

- currently charter vessel

Agency responsible

- DFO/ MEAD/ Groundfish section

Current project leader

- Rob Kronlund, 250-756-7108, Allen.Kronlund@dfo-mpo.gc.ca

Contact person for data and/or results

- Lisa Lacko, 250-756-7385, Lisa.Lacko@dfo-mpo.gc.ca

Principal sampling gear

- longline trap

Number of stations/sets/tows

- Standardized Program: 45
- Randomized Program: 90
- Inlets Program: 20

Principal data collected from above

- trap by trap catches sorted to fish and invertebrates species (as much as possible)

- selected specimens sampled for length, sex, visual maturity, weight, ageing structures, genetics
- selected specimens tagged and released

Statistical design

- Standardized Program: fixed stations of selected commercial areas
- Randomized Program: stratified random
- Inlets Program: fixed station

Oceanographic data collected

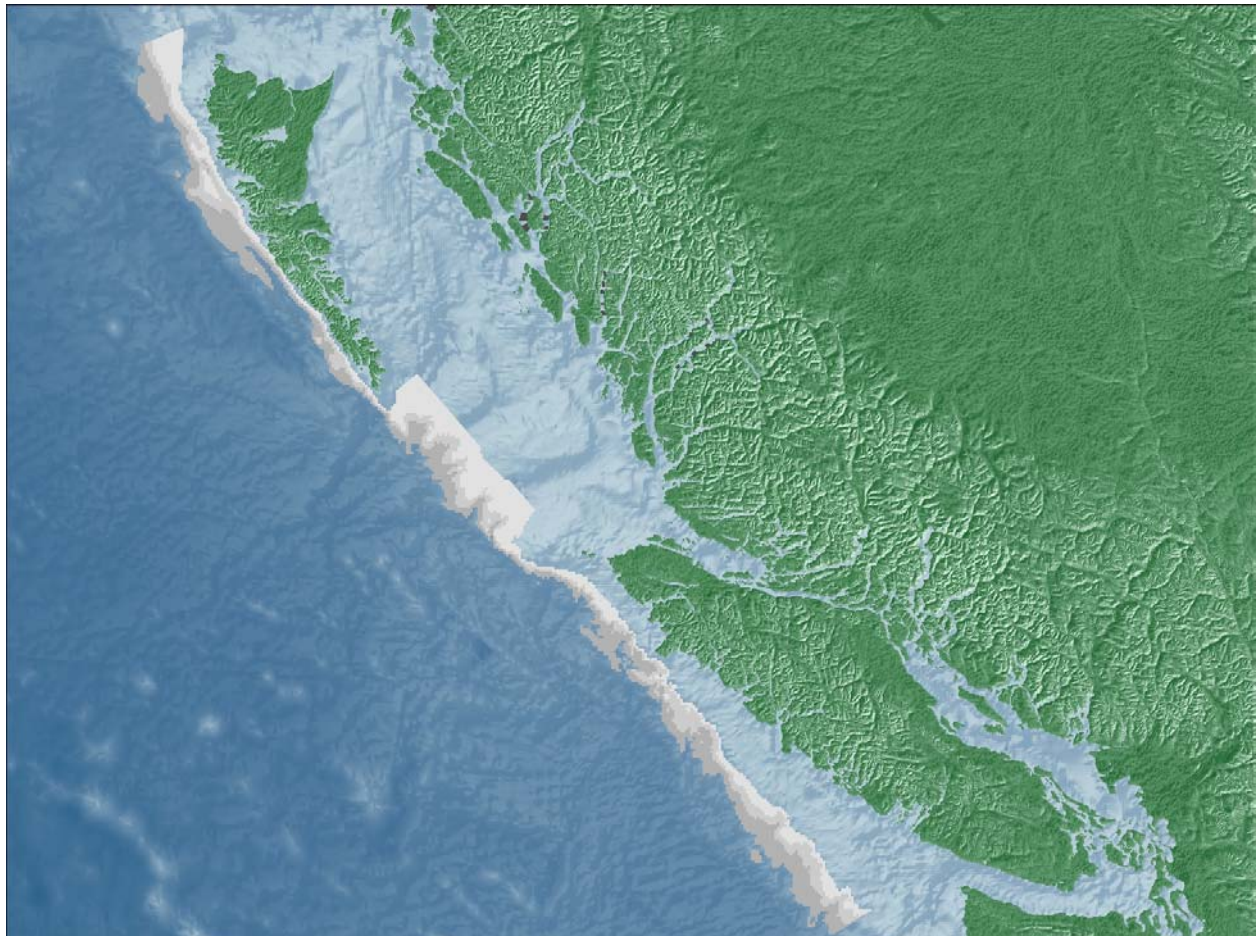
- trap-mounted TDR (temperature-depth recorder)

Key citation for methodology

Wyeth, M.R, A.R. Kronlund, and M. Elfert. 2007. Summary of the 2005 British Columbia Sablefish (*Anoplopoma fimbria*) research and assessment survey. Can. Tech. Rep. Fish. Aquat. Sci. 2694: 105 p

Wyeth, M.R. and A.R. Kronlund. 2003. Sablefish (*Anoplopoma fimbria*) research and assessment surveys conducted in British Columbia waters from 1996 through 2000. Can. Data Rep. Fish. Aquat. Sci. 1116: 130 p

10.10.3. Figure



11. IPHC (INTERNATIONAL PACIFIC HALIBUT COMMISSION)

11.1. IPHC ANNUAL SETLINE STOCK ASSESSMENT SURVEY

11.1.1. Presentation: IPHC_Survey.ppt

11.1.2. Summary

Person completing the template

- Claude Dykstra, 206 552-7662, clauded@iphc.int
- Eric Soderlund, 206-552-7678, eric@iphc.int

General location

- southern Oregon border, northward through British Columbia, southeast Alaska, the Gulf of Alaska, the Bering Sea shelf edge to 60 degrees north, the Pribilof Islands, St. Matthew Island, and along the Aleutian Island chain to 170 degrees east

Depth range

- 20-275 fm

Year survey initiated

- 1998 (current design)

Years conducted

- 1998-2010

Planned frequency

- annual

Time of year conducted

- target June – August, tolerating starts in the last week of May and extending to the first week of September

Government or charter vessel

- charter (10 – 15 commercial longliners)

Agency responsible

- IPHC

Current project leader

- Claude Dykstra, 206 552-7662, clauded@iphc.int

Contact person for data and/or results

- Tom Kong, 206 552-7670, Tom@iphc.int

Principal sampling gear

- fixed-gear longline hook

Number of stations/sets/tows

- ~1240 station on a 10x10 nmi grid

Principal data collected from above

- Pacific halibut sampled for length, sex, maturity, otoliths, prior-hooking injuries
- Projects initiated by other agencies
 - since 2003 in British Columbia, hook by hook data and biological samples (length, sex, visual maturity, weight, ageing structures, genetics) from selected rockfish specimens

- since 2003 (approximately) in Washington and Oregon, every rockfish captured, along with location and depth information, have been delivered to state biologists for further sampling
- in the Bering Sea, Pacific cod length frequencies for NMFS
- Spiny dogfish length frequency project in all areas begins in 2011

Statistical design

- systematic grid

Other gear or sampling methods used in survey

- marine mammal interactions with the gear; i.e., depredation events
- hook status (e.g., the organism on the hook, whether bait is present, missing hook, etc.) of first 20 hooks of each skate, representing 20% of all hooks
- marine mammal sighting (opportunistic)
- seabird count estimates – at the end of every haul, all seabirds within 50m sphere if stern are identified and counted
- Short-tailed Albatross sightings (opportunistic)
- environmental data – sea state, wind direction, swell height

Oceanographic data collected

- sea state
- wind direction
- swell height during haul
- vertical CTD cast at the start of each haul for conductivity (salinity), pressure (depth), temperature, chlorophyll, dissolved oxygen, pH

Key citation for methodology

IPHC Setline Stock Assessment Field Manual

11.1.3. Figure

