RESEARCH REVIEW TEAM DATA REQUEST
Alaska Fisheries Science Center
National Marine Fisheries Service

1.) Please provide a copy of the most resent evaluation of the lab or center in pdf format .

A formal review of the Alaska Fisheries Science Center as a whole has never been performed. Rather, the Center operates under a stepwise policy requiring escalating levels of review from local, internal review for working data, website information and internal documents, mixes of combined internal/external reviews for gray literature and interim analyses, and external independent peer reviews for major findings and professional publications. Additionally, the Center initiates and actively participates in topical reviews as scientific uncertainty, outside interests, economic or social impacts and other controversy may suggest. A very large proportion of the scientific advice to management provided by the Center undergoes extensive review through processes established under law and regulation. Under the MSA, fish and crab stock assessment analyses and advice are reviewed by Council Plan Teams, by the Council's SSC, by the Council's other Advisory Panels and Working Groups, by NOAA GC, through the NEPA processes, and occasionally in Federal Court. Marine mammal stock assessments are periodically reviewed under MMPA and ESA processes including Recovery Teams, the Alaska Scientific Review Group, and the Marine Mammal Commission, each employing a mix of NOAA and external reviewers. The Center has undertaken several focused reviews each year using the NMFS Center for Independent Experts (CIE), typically for important, but not necessarily controversial applications of new modeling technology for stock assessment or ecosystem evaluation. In 2003 for example, CIE reviews for Bering Sea snow crab, and Gulf of Alaska Pollock were completed. In 2004 reviews for Bering Sea Pacific cod and Steller sea lion telemetry are scheduled. A list of independent peer reviews of AFSC projects can be provided upon request.

2.) Please provide a brief history, and mission of your laboratory /center.

Alaska Fisheries Science Center History

The history of the Alaska Fisheries Science Center can be traced back to the late 1800s when scientists aboard the U.S. Fish Commission vessel *Albatross* conducted fisheries investigations off the coasts of California, Oregon, Washington, and Alaska. During many of these cruises, Dr. Charles Gilbert, a professor of biology at Stanford University, acted as field leader of the scientific work. In 1909, Gilbert was appointed by the U.S. Bureau of Fisheries as Scientist in Charge of all fishery investigations along the Pacific Coast and in 1914 a small office opened in Seattle's historic Smith Tower Building as an administrative center for the Bureau's Pacific coast operations. The biology department at Stanford served as the temporary West Coast field station for the Bureau until 22 May 1931 when permanent research facilities were established on the Pacific coast with the official opening of the Seattle Laboratory at Montlake.

In 1956 the U.S. Bureau of Fisheries became the Bureau of Commercial Fisheries (BCF), and Alaskan fisheries research was transferred from Seattle to Juneau. The Auke Bay Laboratory was built in 1960, 12 miles north of Alaska's capital, to house the research groups in Alaska.

In 1971 the BCF became a component of the National Oceanic and Atmospheric Administration (NOAA) and changed its name to the National Marine Fisheries Service (NMFS). As part of this initial reorganization, four independent research groups in Seattle--the Biological Laboratory, the Marine Mammal Research Laboratory, the Exploratory Fishing and Gear Research Base, and the

Food Science Pioneer Research Laboratory--were combined with the exploratory fishing and gear research, the marine fisheries, and the shellfish groups located in Kodiak, Alaska, to form the Northwest Fisheries Center (NWFC). A fifth independent research group, the Technological Laboratory, was renamed the Pacific Utilization Research Center. As part of the 1971 reorganization, the exploratory fishing and gear research groups were renamed the Marine Fish and Shellfish Division. The fish passage group at the Biological Laboratory became the Coastal Zone and Estuarine Studies Division (CZES), and the Environmental Conservation (EC) Division was formed from the Food Science Pioneer Research Laboratory. The Auke Bay Laboratory in Alaska became a part of the Northwest Fisheries Center in 1974, which was then renamed the Northwest and Alaska Fisheries Center (NWAFC). In 1975, the Marine Fish and Shellfish Division was divided and the Resource Assessment and Conservation Engineering (RACE) and Resource Ecology and Fisheries Management (REFM) Divisions were created. In 1976, the Pacific Utilization Research Center was brought into the NWAFC and was renamed the Utilization Research (UR) Division.

In 1984, the Center Director's Office (including its Office of Fisheries Information Systems (OFIS)) and the RACE and REFM Divisions of the NWAFC moved to a new facility at the NOAA Western Regional Center at Sand Point in Seattle. The National Marine Mammal Laboratory (NMML) moved at this time from another Sand Point building to the new facility. The UR and EC Divisions remained at Montlake because of their extensive laboratory space, and the CZES Division remained at Montlake because of its fish-rearing facilities. The Fisheries Data and Management Systems Division was disbanded in early 1986. Mainframe computer services were carried on by the Office of Fisheries Information Systems group of the Center Director's Office.

In 1988, the NWAFC was divided into the Alaska Fisheries Science Center (ABL, NMML, OFIS, and the RACE and REFM Divisions) and the Northwest Fisheries Science Center (CZES, EC, and UR Divisions). The restructuring plan emphasized continued Division interaction. The RACE, REFM, and UR Divisions, and the NMML, with program responsibilities which apply to both the Northwest and Alaska regions, support the ecosystem goals of both the Northwest and Alaska Regional Offices. The ABL and the CZES Division, which have considerable salmonid expertise, also support both Regional Offices through the continuation of integrated programs, particularly regarding U.S.-Canada salmon treaty work. The EC Division, with a critical role in environmental science, assists both Regional Offices.

MISSION STATEMENT
ALASKA FISHERIES SCIENCE CENTER

The Alaska Fisheries Science Center (AFSC) is the fisheries research branch of the National Oceanic and Atmospheric Administration (NOAA) responsible for the study and conservation of living marine resources in Alaskan waters. The mission of the Alaska Fisheries Science Center, consistent with NOAA and NOAA Fisheries Strategic Goals and Objectives is to plan, develop, and manage scientific research programs that generate the best scientific data available for understanding, managing, and conserving the region's living marine resources and the environmental quality essential for their existence. The AFSC conducts field and laboratory research to help conserve and manage the region's living marine resources in compliance with the Magnuson-Stevens Fishery Conservation and Management Act of 1996, the Marine Mammal Protection Act of 1972, and the Endangered Species Act of 1973. Center scientists compile and analyze broad databases on fishery, oceanography, marine mammal, socioeconomic and

environmental research. These data are used to develop policies and strategies for fisheries management within the U.S. Exclusive Economic Zone, monitor the health of the region's marine mammal populations, and assess the impacts of chemical contaminants and physical alterations on select organisms and marine habitats. The Alaska Fisheries Science Center is headquartered in Seattle, Washington, with laboratories and other facilities in Auke Bay, Kodiak, Dutch Harbor, and Little Port Walter, Alaska, and Newport Oregon.

NOAA Mission Goals

The work conducted at the Alaska Fisheries Science Center is primarily in support of NOAA Mission Goal 1: Protect, restore, and manage the use of coastal and ocean resources through ecosystem-based management. Research and management support activities at the AFSC are nearly all associated with the Ecosystem Research goal team and to a lesser degree with the Undersea Research and Exploration, Protected Resources Management, and Habitat restoration goal teams. The AFSC is prepared to participate in and support NOAA Matrixed Programs as they develop.

NOAA Fisheries Strategic Objectives

The Alaska Fisheries Science Center develops and implements research programs to address each of the three NOAA Fisheries objectives under NOAA Mission Goal 1: A) Protect and restore ocean, coastal, and Great Lakes resources, B) Recover protected species, and C) Rebuild and maintain sustainable fisheries. As a major part of the AFSC mission, research relative to rebuilding and maintaining sustainable fisheries is conducted by three AFSC Divisions: Resource Assessment and Conservation Engineering (RACE), Resource Ecology and Fisheries Management (REFM) and the Auke Bay Laboratory (ABL). Similarly, research related to the recovery of protected species is addressed by multiple AFSC Divisions, but includes the majority of activities at the National Marine Mammal Laboratory (NMML). Protection and restoration of ocean and coastal resources is studied in various forms in all Divisions, including emphasis on benthic habitats, effects of fishing and essential fish habitat by ABL and RACE Divisions. Among the most significant AFSC activities associated with each of the NOAA Fisheries Strategic Objectives are the following:

1. Protect and restore ocean, coastal, and Great Lakes resources
    - Discovery and characterization of dense aggregations of cold-water corals in the Aleutians and implementation of studies to delineate distribution and describe their biology and species associations
    - Research on the essential fish habitat of groundfish species and on the changes incurred by fishing to such habitat so that trends and impacts of fishing to groundfish stocks can be predicted
    - Mapping of benthic habitat associated with Alaskan fishing grounds
    - Documenting the persistence of Exxon Valdez oil in selected habitats and species, determining the link between persistent oil and its effects on sea otters and harlequin ducks (in cooperation with USFWS)

2. Recover protected species
- Comprehensive program of research related to the Steller sea lion decline, including abundance, trends, stock structure, life history, foraging ecology, and health
- Long term research on northern fur seal health, condition and co-management

- Research on the use of acoustic technology to determine the temporal and spatial distribution of large whales in the North Pacific
- Vessel and aerial surveys of cetaceans in Alaskan waters: emphases on killer whale distribution, abundance and foraging ecology in the range of the western population of Steller sea lions; and abundance and distribution of small cetaceans
- Co-management of Cook Inlet beluga whales and western Arctic bowhead whales
- Develop Stock Assessment Reports for marine mammal stocks in Alaskan waters

3. Rebuild and maintain sustainable fisheries

- Annual groundfish/crab bottom trawl survey of eastern Bering Sea shelf, biennial groundfish bottom trawl survey of Gulf of Alaska shelf and slope
- Annual winter acoustic surveys (EIT) for spawning Alaska pollock for Bogoslof Island area, Shumagin Islands, and Shelikof Strait including shelf break from Chirikof Is. to Prince William Sound
- Biennial summer acoustic survey (EIT) for Alaska pollock for western/central area of the Gulf of Alaska
- Determine status of major groundfish stocks and their biological productive potential in the Bering Sea-Aleutians region and the Gulf of Alaska
- Determine status of crab stocks and their guideline harvest levels in the Bering Sea-Aleutians region
- Develop multi-species technical interaction projection models to evaluate effects of fishing on multiple components of the ecosystem for Environmental Impact Statement Analyses

3.) Please provide a listing of major customers of the laboratory /center, with a one sentence description of what is being done for them.

NMFS Alaska Regional Office – The AFSC supplies the Regional Office with the scientific data and analyses that are required to manage fisheries, protected resources and habitat under NMFS jurisdiction in Alaska.

North Pacific Fisheries Management Council – Like the products provided to the AK region, AFSC provides the NPFMC with the scientific data and analyses that are required to manage fisheries, protected resources and habitat under NMFS jurisdiction in Alaska. In addition, AFSC staff serve on NPFMC committees and regularly testify, providing expert scientific advice on resource management issues.

Alaska Fishing Industry – The AFSC provides multiple components of the Alaskan fishing industry with science based information on the status of commercially important marine resources and research findings related to fisheries interactions with protected species and habitat.

International Whaling Commission – The AFSC Director is the Chairman of the IWC Scientific Committee and Center staff act as analysts and advisors to the US Commissioner to the IWC.

Alaska Marine Mammal Scientific Review Group – These regional entities are formed under the

MMPA to review an provide advice to NOAA on the status and management of marine mammals. They are major users and reviewers of the AFSC stock assessments for all marine mammals.

NGOs – A wide variety of non-governmental organizations commonly request data and analyses from the Center for use in public information campaigns, for their participation in public rulemaking processes, and for preparation of lawsuits against NMFS and other government agencies.

Media – Phone and television interviews, website sources and analyses are commonly provided to the media on subjects of public interest.

Academia – By virtue of its consistent efforts to assess the status of important stocks of fish, crabs and marine mammals in Alaskan waters, the AFSC has amassed a reliable substrate of biological information against which university scientists compare their results, track changes of interest over time, and formulate hypotheses for their research. The Center's databases are an invaluable and irreplaceable asset for the broader research community.

3.) Please provide a summary of research being conducted (Your list of major requirements from the Program Baseline Assessments (PBA) maybe helpful in answering this question.)

4.) Major Theme Areas:

3 and 4a are combined

Research activities at the Alaska Fisheries Science Center are predominantly associated with the Ecosystem Research Program. Likewise, studies are developed and implemented to address each of the three NOAA Fisheries Strategic Objectives within the overall Ecosystem mission strategic goal. The four AFSC Divisions are responsible for particular aspects of the overall research program, but do not represent separate research entities. Rather, they operate under the direction of the AFSC Science Director who sets overall priorities and directions in keeping with NOAA and NOAA Fisheries missions and policy. In the following sections, specific to each AFSC Division, the major research activities are characterized and linked to the NOAA Fisheries Strategic Objectives they support.

Resource Assessment and Conservation Engineering Division (RACE) - Conducts fishery surveys to measure the distribution and abundance of commercially important fish and crab stocks in the eastern Bering Sea, and Gulf of Alaska. Data derived from these surveys are analyzed by Center scientists and supplied to fishery management agencies and to the commercial fishing industry. The RACE Division is comprised of seven programs:

Midwater Assessment and Conservation Engineering (MACE) - Plans, executes, analyzes, and reports results from echo integration(acoustic) and midwater trawl surveys to assess the status of walleye pollock stocks from the Bering Sea and Gulf of Alaska. The program also carries out

research to optimize survey design, improve target strength measurements, understand fish avoidance due to radiated vessel noise, and advance the application of fishery acoustics.

Groundfish Assessment - Conducts and reports results of surveys designed to establish time series estimates of the distribution and abundance of groundfish resources in waters off Alaska following an annual and biennial survey strategy of the Eastern Bering Sea, Aleutian Islands, and the Gulf of Alaska. The Program conducts studies to estimate the catchability of survey gear for the dominant species and investigates biological processes and interactions with the environment to estimate growth, mortality, and recruitment

Recruitment Processes - Investigates the early life stages (eggs, larvae and early juveniles) of fish as a means to understand population processes.

Fish Behavioral Ecology - Conducts laboratory research aimed at understanding the relationship between behavioral responses of marine fish and their associated environmental factors, and how this relationship influences distribution, recruitment, and survival of economically important species.

Survey Gear Construction and Maintenance - Operates a large net shed staffed and equipped to construct and maintain standard fishing gear used in the RACE Division's resource assessment surveys.

Shellfish Assessment - Responsible for planning, executing, analyzing, and reporting results from surveys to establish time series estimates of the distribution and abundance of king, Tanner, and snow crab in the eastern Bering Sea. The activity also investigates biological processes and interactions with the environment to estimate growth, mortality, and recruitment of crab to improve the precision and accuracy of forecasting stock dynamics

RACE Current Activities:
(NOAA Fisheries Objectives supported**:** **PRO**=Protect and Restore Ocean, Coastal, and Great Lakes Resources, B) **RPS**=Recover Protected Species, and C**)** **RMSF**=Rebuild and Maintain Sustainable Fisheries)

- Annual groundfish/crab bottom trawl survey of eastern Bering Sea shelf, biennial groundfish bottom trawl survey of Gulf of Alaska shelf and slope **RMSF**
- Annual winter acoustic surveys (EIT) for spawning Alaska pollock for Bogoslof Island area, Shumagin Islands, and Shelikof Strait including shelf break from Chirikof Is. to Prince William Sound **RMSF**, **RPS**
- Biennial summer acoustic survey (EIT) for Alaska pollock for western/central area of the Gulf of Alaska **RMSF**, **RPS**
- Annual Pavlof Bay shrimp survey, the longest continuous annual survey of its type in the North Pacific offers a linkage of species community structure including forage fish species to climatic changes on decadal scales in the Gulf of Alaska **RMSF**, **RPS**

- Research cruise and cooperative industry EFP cruise to experiment with trawl gear modifications and conduct trials to reduce the bycatch of salmon in midwater pollock fishery **RMSF**, **RPS**
- Lead the NOAA Fisheries Advanced Technology Working Group **RMSF**
- Lead the development of NOAA Protocols for bottom trawl surveys and participate in other survey protocol development exercises **RMSF**
- Publish and distribute survey data reports and Industry reports on the bottom trawl surveys **RMSF**
- Improve the accuracy of species identification of fish and invertebrates captured on RACE resource surveys and publish new species descriptions. **RMSF**, **PRO**
- Conduct research and publish results on the effects of chronic bottom trawling on the abundance and size structure of soft-bottom benthic invertebrates **PRO**, **RMSF**
- Conduct Fisheries Oceanography Coordinated Investigations annual research cruises to measure bio-physical processes in the Gulf of Alaska relevant to the recruitment and survival of pollock year classes **RMSF**, **RPS**
- Conduct the research to examine the physical and biological factors that affect the geographic distribution and interannual variability of nursery habitats for juvenile pollock and capelin in the western Gulf of Alaska which are important prey species for Steller sea lions **RMSF**, **RPS**
- Publish laboratory research on potential for survival of critical bycatch species (halibut, juvenile pollock, sablefish, and lingcod) that undergo capture stress **RMSF**
- Expand research efforts to merge laboratory studies with field research to identify the essential habitat for juvenile rock sole and Pacific halibut to determine role of biogenic and bed-form structures on the predation mortality and habitat preferences of juvenile flatfishes **RMSF**, **PRO**
- Documentation of modeling results of relative fishing gear effects on seafloor habitat to be incorporated in the EFH EIS. **RMSF**, **PRO**
- Division scientists are active in several community outreach programs to interest K-12 students marine science and NOAA research. Chair the Steering Committee of the Ballard Maritime Academy within the Seattle Public Schools **RMSF**, **PRO**, **RPS**
- Seasonal series of short research cruises in collaboration with ADFG to sample snow crab (Chionoecetes opilio) to discern their reproductive dynamics and life-history of in the eastern Bering Sea **RMSF**
- Publish results of studies examining genetic population structure in walleye pollock and initiate a comparable study of Pacific cod in the Bering Sea and Gulf of Alaska **RMSF RPS**
- Laboratory studies on early life history of red king crab, snow crab, Tanner crab, Hairy crab (*Haplogaster mertensii*) and several other species to ascertain hatch times and survival of larvae, cultivation methods, larval description, and tagging mortality in addition to improving methods for cultivating crab larvae, understanding settlement behavior by crab larvae and use of essential habitats, and determining cannibalism/predation levels of settling crab **RMSF**, **PRO**

Resource Ecology and Fisheries Management Division (REFM) - Conducts research and data collection to support management of Northeast Pacific and eastern Bering Sea fish and crab resources and to improve understanding of marine ecosystem relationships for advancing ecosystem-based management advice. Groundfish and crab stock assessments are developed

annually and used by the North Pacific Fishery Management Council to set catch quotas. Division scientists evaluate how fish stocks, other ecosystem components and user groups might be affected by fishery management actions and evaluates the role of climate in producing change. The REFM Division is comprised of six Programs:

Fisheries Observers - Collects and disseminates information obtained by observers deployed aboard Alaska groundfish fisheries vessels and at shoreside processing plants. The information is used for: assessing in-season catch and discard rates and total annual catch levels; producing annual groundfish stock assessments; monitoring incidental catch of protected species including marine mammals and seabirds; and monitoring compliance with management regulations.

Age and Growth Studies - Provides age data for use in age structured modeling of exploited fish populations and contributes to our basic understanding of fish species in the contexts of sustainable fisheries, species conservation, and ecology.

Status of Stocks and Multispecies Assessments - Conducts analyses of the condition of Alaskan fisheries resources in the U.S. Exclusive Economic Zone and develops strategies for managing those resources. Research focuses on updating information on population dynamics trends, estimation of biological yields, and management strategies.

Resource Ecology and Ecosystems Modeling - Collects and analyzes data relating to trophic interactions in the North Pacific marine ecosystems and incorporates those data into environmental assessments, single-species models and multispecies models.

Socio-Economic Assessment - Collects economic and socio-cultural data relevant for the conservation and management of living marine resources and develops models to use that data both to monitor changes in economic and socio-cultural indicators and to estimate the economic and socio-cultural impacts of alternative management measures.

REFM Current Activities:

(NOAA Fisheries Objectives supported**:** **PRO**=Protect and Restore Ocean, Coastal, and Great Lakes Resources, B) **RPS**=Recover Protected Species, and C**)** **RMSF**=Rebuild and Maintain Sustainable Fisheries)

- Deploy scientific observers to sample 100 % of the large fishing vessels and all processing plants, and 30% of the smaller fishing vessels engaged in the Alaska groundfish fisheries **RMSF**, **RPS**
- Evaluate restructuring of the North Pacific Groundfish observer program to meet current goals of fisheries management **RMSF**, **RPS**
- Provide production age reading and research verification of aging techniques **RMSF**
- Determine status of major groundfish stocks and their biological productive potential in the Bering Sea-Aleutians region and the Gulf of Alaska **RMSF**
- Determine status of crab stocks and their guideline harvest levels in the Bering Sea-Aleutians region **RMSF**
- Improve assessments for rockfish and other species off Alaska under NOAA's Fisheries Stock Assessment Improvement Plan. **RMSF**

- Study short-term, localized effects of trawl fisheries on Pacific cod, Atka mackerel and walleye pollock abundance as they would affect the availability of these groundfish species as prey to Steller sea lions **RMSF**, **RPS**
- Develop multi-species technical interaction projection models to evaluate effects of fishing on multiple components of the ecosystem for Environmental Impact Statement Analyses **RMSF**, **RPS**
- Evaluate strategies for assessing and managing minor species components and catches in the fisheries **RMSF**
- Provide technical liaison between fisheries science and management to bring about application of scientific research to fisheries regulations **RMSF**, **RPS**
- Compile information on predator/prey relationships **RMSF**, **RPS**
- Compile ecosystem status and trend information **RMSF**, **RPS**
- Develop multispecies and ecosystem predator/prey models **RMSF**, **RPS**
- Develop indicators of ecosystem change **RMSF**, **RPS**, **PRO**
- Evaluate effects of fishing and climate on the ecosystem **RMSF**, **RPS**
- Develop improved methods for estimating fishing capacity **RMSF**
- Develop socio-cultural indicators and profiles for fishing communities **RMSF**
- Develop economic profiles for fishing communities and regional economic models **RMSF**
- Develop economic data collection programs **RMSF**
- Compile traditional ecological knowledge **RMSF**, **RPS, PRO**
- Contribute to regulatory analyses for a range of management issues **RMSF**, **RPS**, **PRO**
- Provide data to support industry efforts to rationalize the BSAI groundfish fisheries **RMSF**
- Contribute to national and regional efforts to address the bycatch problem **RMSF**

National Marine Mammal Laboratory (NMML) - Responsible for conducting research on marine mammals important to the mission of NOAA, with particular attention to issues in Alaska and the North Pacific. This work includes stock assessments, life history determinations, and status and trends. Determination of marine mammal population status and trends requires information on abundance, stock structure, mortality and net productivity and involves censuses from ships, aircraft and on land. The NMML is comprised of six Programs

Alaska Ecosystems - Responsible for conducting research on Steller sea lions and northern fur seals and advising NMFS on the status of these species. Biological information relating to the following are collected and analyzed: 1) Stock structure (distinguishing subgroups within a particular species); 2) Abundance (number of animals) and net productivity (population growth); 3) Mortality of animals caused by natural and anthropogenic sources; 4) Life history data (rates of survival and reproduction); 5) Foraging ecology, health and condition, and diet/prey distribution.

Polar Ecosystems - Conducts pinniped research in Arctic, sub-Arctic, and Antarctic marine ecosystems with the underlying objective of determining population dynamics and the factors which are primarily responsible for influencing these populations. Current studies focus on abundance, feeding ecology, reproductive success, growth and condition, demography, and habitat needs. Sub-Arctic research is focused on Alaska harbor seals throughout their entire geographic range. Research on Arctic ice seals (ringed, bearded, spotted, and ribbon seals) include surveys and behavioral studies utilizing satellite-linked transmitters. Studies of Antarctic

ecosystems are currently focused on ice seal ecology, which provides valuable ecological comparisons with Arctic ice seals.

Cetacean Assessment and Ecology - Monitors the status of cetacean species in Alaska waters, including bowhead whales, beluga whales, gray whales, killer whales, fin whales, North Pacific right whales, humpback whales, harbor porpoise, and Dall's porpoise. Periodic assessments are conducted through aerial surveys, shipboard research, shore-based counts, acoustic studies, tagging studies, photo-identification of individual animals, and collection of opportunistic sighting data through the Platforms of Opportunity Program.

California Current Ecosystems - Assesses status and trends of marine mammals in Washington, Oregon and California waters including the ecological impact of their involvement with fisheries. Research focus includes population status, trends, disease and response of pinniped populations to oceanographic environmental variability caused by atmospheric patterns such as ENSO and the Pacific Decadal Oscillation (PDO).

Systemic Management - Provides alternative management advice on achieving sustainable fisheries in harvesting fish resources simultaneously from individual species, groups of species, and ecosystems based on empirical information and accounting for factors such as population dynamics, genetic effects of harvesting, predator/prey relationships, competition and nutrient flow in proportion to their relative importance.

NMML Current Activities:
(NOAA Fisheries Objectives supported**:** **PRO**=Protect and Restore Ocean, Coastal, and Great Lakes Resources, B) **RPS**=Recover Protected Species, and C**) RMSF**=Rebuild and Maintain Sustainable Fisheries)

- Steller sea lion abundance, trends, stock structure, life history, foraging ecology, health, and co-management **RPS**
- Northern fur seal health, condition and co-management **RPS**
- Population abundance and trends, glacial photogrammetry, stock structure and co-management; potential for vessel disturbance of Alaska harbor seals **RPS**
- Research on the use of acoustic technology to determine the temporal and spatial distribution of large whales in the North Pacific **RPS**
- Vessel and aerial surveys of cetaceans in Alaskan waters: emphases on killer whale distribution, abundance and foraging ecology in the range of the western population of Steller sea lions; and abundance and distribution of small cetaceans **RPS**
- Co-management of Cook Inlet beluga whales and western Arctic bowhead whales **RPS**
- Population abundance, trends and foraging ecology of California sea lions, fur seals, harbor seals and harbor porpoise in the North Pacific, with special emphasis on Puget Sound waters **RPS**
- Health and disease status of California sea lions (NSF) **RPS**
- Arctic ice seal seasonal distribution, habitat selection and co-management **RPS**
- Antarctic pack ice seal ecology (w/ NSF) **RPS**
- Develop Stock Assessment Reports for marine mammal stocks in Alaskan waters **RPS**

Auke Bay Laboratory (ABL) - ABL is a diversified laboratory conducting research to solve a variety of domestic and international fishery management problems. The Little Port Walter field station on Baranof Island is ABL's primary field station where researchers conduct studies on five species of salmon. The ABL is comprised of six research Programs:

Marine Salmon Interactions (MSI) - Conducts research on the early marine ecology of juvenile salmon populations using surface trawls to study migration timing and abundance patterns along with associated biophysical parameters. Such research includes studies on the bioenergetics of diets and seasonally available prey foods to estimate carrying capacity of wild and hatchery stocks in near shore and coastal waters of Southeast Alaska

Stock Identification (SIDA) - Conducts genetic research to provide information on Pacific salmon stock identity in support of regional, national, and international agreements and treaties.

Ocean Carrying Capacity (OCC) - Conducts research on variations in salmon and other fish populations, climatic and environmental conditions, and oceanic ecosystems to identify linkages between current trends in ocean productivity and salmonid carrying capacity.

Groundfish Assessment - The program conducts annual stock assessments and recommends harvest levels used by the North Pacific Fishery Management Council to manage Alaska sablefish and Gulf of Alaska rockfish fisheries. Research also includes the annual cooperative longline survey, studies on benthic habitat (including cold-water corals) and the effects of fishing impacts on that habitat.

Habitat - Conducts field and laboratory assessments on the health of ecosystems, by measuring either energy state in target species or their forage, or by the measurement of persistent contaminants directly in target species or the habitat. This multi-disciplinary program relies heavily on biologist/chemist teams and instrumentation to measure a variety of health parameters (lipids, fatty acids, calories), parasite loads, or a variety of contaminants.

Exxon Valdez Oil Spill (EVOS) - Conducts long-term effects research on the effects of the 1989 oil spill on fish and invertebrates of Prince William Sound and persistence of oil in the environment.

ABL Current Activities:
(NOAA Fisheries Objectives supported**:** **PRO**=Protect and Restore Ocean, Coastal, and Great Lakes Resources, B) **RPS**=Recover Protected Species, and C**)** **RMSF**=Rebuild and Maintain Sustainable Fisheries)

- Genetic stock identification analyses of chum and sockeye salmon in the Gulf of Alaska and the Bering Sea to determine stock specific marine migration timing and pathways **RMSF**
- Field studies associated with the Southeast Coastal Monitoring Program, GLOBEC, and BASIS research programs to understand mechanisms underlying environmental and climatic effects on the distribution, migration, growth, and survival of salmon in the Gulf of Alaska and Bering Sea **RMSF**

- Retrospective analyses using archived salmon scales to test hypotheses that salmonid growth and survival is determined largely by interdecadal and interannual variations in physical environmental conditions and productivity of subarctic Pacific waters **RMSF**
- Documenting the persistence of Exxon Valdez oil in selected habitats and species, determining the link between persistent oil and its effects on sea otters and harlequin ducks (in cooperation with USFWS) **SHC**
- Determining the fatty acid signature and energy state in several forage species, which can be used to assess significance relative to Steller Sea Lion declines **RPS**
- Discovery and characterization of dense aggregations of cold-water corals in the Aleutians and implementation of studies to delineate distribution and describe their biology and species associations **PRO**
- Conduct direct assessments of groundfish stocks in support of their fisheries management: this activity includes the annual longline survey of the Gulf of Alaska and of the Bering Sea/Aleutians (supported logistically by RACE) **RMSF**
- Research on the essential fish habitat of groundfish species and on the changes incurred by fishing to such habitat so that trends and impacts of fishing to groundfish stocks can be predicted **RMSF**, **PRO**
- Field research supporting Steller sea lion management issues include a seasonal prey availability and foraging study in Southeast Alaska, and a sleeper shark-sea lion predation study **RPS**, **RMSF**
- Mapping of benthic habitat associated with Alaskan fishing grounds **RMSF**, **PRO**
- Development of strategies to help in recovery of salmonid stocks listed under the Endangered Species Act (ESA) **RPS**, **RMSF**
- Studies on hatchery-wild stock interactions in two stocks of Southeast Alaska chinook salmon **RMSF**
- Long-term monitoring freshwater and marine survival variability in seven endemic anadromous salmon populations at Auke Creek **RMSF**

4b. Provide the geographic scope of your research - regional, national, global.

Center research has its primary focus on the US EEZ in the North Pacific and Bering Sea, and the biological and physical processes influencing those areas. International research collaboration involves Russia, Japan, Korea, Canada and Norway for commercial fish resources, marine mammals, and the climatic and oceanographic processes affecting those resources. Global level work involves collaborating to bring regional information and analyses into global perspective and to contribute to larger scale synthesis of process information.

4c Provide the time frames of your research - short term, (0-2 years), medium term, (2-5 years), long term (greater than 5 years).

The AFSC is involved in research at all time scales. The mix is dictated by the priority information needs for resource management and recovery, the relative value of time series data, and the resources available. Most research is short to mid term, generating information as required for management decision-making. Exceptions include long time series on Bering Sea and Gulf of Alaska groundfish and crab biomass, Pribilof Islands fur seal stocks, and the western stock of Steller sea lion.

5.) Please provide a listing of 3-5 major accomplishments in the last five years.

1. Annual Stock Assessment and Fishery Evaluation (SAFE, for fish and crab) and Stock Assessment Reports (SARs for marine mammals) documents

2. Discovery of deep-sea coral beds in the Aleutian Islands

3. Analyses of long-term effects of crude oil on coastal habitat

4. Development of National Standard 1 guidelines to elucidate targets for improved fishery stock assessment and management

5. Operation of the largest fisheries observer program in the United States

6.) Please provide a summary of legal mandates for the work in the laboratory/center.

The primary laws and treaties include (there are dozens of minor laws):

- Magnuson-Stevens Act (MSA)
- Endangered Species Act (ESA)
- Marine Mammal Protection Act (MMPA)
- National Environmental Policy Act (NEPA)
- Pacific Salmon Treaty
- North Pacific Anadromous Stocks Act
- Convention on the International Trade in Endangered Species
- Convention on the Conservation and Management of Pollock Resources in the Central Bering Sea

7.) Attached in Excel format is the compilation of financial and staffing data that your laboratory or line office provided.

See attached, corrected spreadsheet.

In your response please identify a contact person and a telephone number, in case clarifying information is needed.

Jim Coe, Deputy Science & Research Director, AFSC
Phone: 206 526-4000
E-mail: jim.coe@noaa.gov