COOK INLET REGIONAL CITIZENS ADVISORY COUNCIL

ANNUAL REPORT 2005

Contents

Mission Statement

Our mission is to represent the citizens of Cook Inlet in promoting environmentally safe marine transportation and oil facility operations in Cook Inlet.

The mission statement of Cook Inlet RCAC is a reflection of the mandates spelled out by Congress when it passed the Oil Pollution Act of 1990, thereby creating two citizen oversight councils – one for Cook Inlet and one for Prince William Sound. Congress established the councils to ensure that citizens, the oil industry, and government agencies would work together to prevent oil spills in Alaska's waters.

Since that time, Cook Inlet RCAC has been a strong voice for citizens from Anchorage to Kodiak working to keep the waters of Cook Inlet free from pollution.

Donna McCoy

Cover photo by Mandy Lindeberg

Message from the Executive Director and President

Donna McCoy

When the M/V *Selandang Ayu* ran aground and broke apart in late 2004 near Dutch Harbor spilling its cargo and over 300,000 gallons of oil and diesel, it demonstrated once again that no one has more at stake in resource development than those who inhabit the region where it occurs. The Cook Inlet Regional Citizens Advisory Council is a product of that same reasoning – promoting citizen involvement where environmental monitoring and oil spill prevention is a concern.

Citizens in the Aleutian Islands lack the mechanism for citizen oversight afforded to Prince William Sound and Cook Inlet through the Oil Pollution Act of 1990. That law, crafted after the *Exxon Valdez* oil spill, sought to replace complacency with vigilance and entrusted the citizens most affected by development with the means to help reform an industry and the agencies charged with regulating it. Fifteen years after the signing of the law, this unique vehicle for citizen involvement continues to make a difference.

Cook Inlet RCAC has had another remarkable year where collaboration remains central to our development and success. By working with others, we are better able to stretch our resources to the benefit of citizens across our region. Workgroups comprised of representatives from state and federal agencies, industry, local villages, and cities drive projects such as the Geographic Response Strategies (GRS) for Kodiak, the Alaska Permits, Forms, and Applications Project, and more recently, the Geographic Resource Information Network or GRIN. The workgroup process ensures that local stakeholders from Anchorage to Kodiak have a role in developing the means for protecting their environment in the event of a spill.

Collaboration is just as important to our environmental monitoring program. Partnerships within the scientific community have enhanced projects such as Shorezone Mapping, Hydrographic Surveys, Drifter Buoy Tracking, and have assisted in developing a Gulf of Alaska component of the Alaska Ocean Observing System (AOOS). AOOS is the Alaska component of a growing national network of integrated ocean observing systems that will improve our ability to rapidly detect changes in marine ecosystems and living resources, and predict future changes and their consequences for the public good.

While we continue to make a difference in regulation development and contingency planning, we recognize that important gaps in prevention – like the need for a comprehensive navigational risk assessment – remain unaddressed. Oil tankers leave Valdez with tug escorts while a vessel tracking system that incorporates the best available technology monitors their progress. These prevention measures in place have significantly reduced the risk of an oil spill in Prince William Sound. We feel that regulators should focus the same attention on Cook Inlet, a waterway that is a critical transporation link for Southcentral Alaska and serves over half the state's population.

Marine traffic in Cook Inlet includes oil tankers, freight ships, LNG vessels, urea and fuel barges, wood chip haulers, cruise ships, thousands of personal use and commercial fishing watercraft and, if recent mining development plans are successful, ore carriers and coal barges. These vessels are operating in one of the most challenging waterways in the country. Government and industry officials attending the Council-sponsored "Safety of Navigation in Cook Inlet" forum in 1999, agreed through consensus that a comprehensive risk assessment was an essential step for improving vessel safety.

We remain committed to working with the U.S. Coast Guard and the State of Alaska to develop this assessment as well as our current projects described in these pages. Together, the projects serve our mission to promote safer marine transportation and oil facility operations in Cook Inlet.

Michael Munger
Executive Director

Doug Jones
President

Cook Inlet RCAC has had another remarkable year where collaboration remains central to our project development and success.

Top photo: R/V *Island C* in Uyak Bay, Kodiak Island

Membership & Organizations

Terrance Bryant

The USS *Hickory* deploys boom during the an oil spill exercise in Kachemak Bay.

The organization of the Cook Inlet Regional Citizens Advisory Council is outlined in the Oil Pollution Act of 1990 (OPA 90). The thirteen-member Board of Directors represents various municipalities, cities, boroughs, and special interest groups to ensure broad representation of all citizens within the Cook Inlet region. The Act also calls for the inclusion of non-voting Ex-Officio members, representing various state and federal agencies.

Board of Director Seats

Municipality of Anchorage
City of Homer
City of Kenai
City of Kodiak
City of Seldovia
Kenai Peninsula Borough
Kodiak Island Borough
Alaska Native Groups
Aquaculture Associations
Environmental Interest Groups
Commercial Fishing Groups
Recreational Groups
State Chamber of Commerce

Donna McCoy

Calcareous tube worm, *Serpula vermicularis.*

Ex-Officio Members

Captain Ronald Morris
United States Coast Guard

Gary Lehnhausen
U.S. Forest Service

Joe Dygas
Bureau of Land Management

John Whitney
National Oceanic and Atmospheric Administration

Matt Carr
Environmental Protection Agency

Richard T. Prentki
Minerals Management Service

Michelle Heun
Alaska Division of Emergency Services

William J. Hutmacher
Alaska Department of Environmental Conservation

Tom Bucceri
Alaska Department of Natural Resources

OPA 90 requires the Council to establish committees to accomplish its mandates. To that end, Council directors and public members comprise the Environmental Monitoring Committee (EMC), the Prevention, Response, Operations, and Safety Committee (PROPS), and the Protocol Committee to assist the Council in meeting its obligations.

Environmental Monitoring Committee

Council members:

Molly McCammon, chair
Doug Jones
John French
Rob Lindsey
Bob Shavelson
James Showalter

Public members:

Craig Valentine
Marilyn Sigman
Walle Koning
Steve Hackett
Steve Hunt
Elizabeth Chilton
Glen Glenzer

Prevention, Response, Operations, and Safety Committee

Council members:

Paul Shadura, chair
Rob Lindsey
Grace Merkes
June Reuling
Mary Jacobs
John French

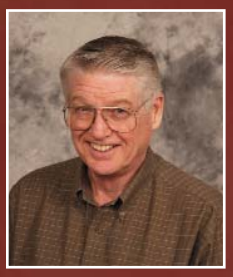
Public members:

Bob Baker
Jerry Brookman
Barry Eldridge
Joe Gabriel
Lois Epstein
Phillip Cutler
Bill Osborn

Protocol Committee

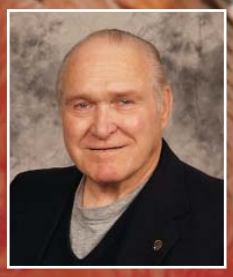
John Douglas, chair
Robert Peterkin, II
Paul Shadura
Doug Jones
Rob Lindsey
Grace Merkes

Board Members



Doug Jones
Recreational interest groups President

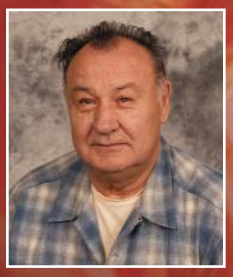
June Reuling
City of Seldovia Vice-President



John Douglas
City of Kenai Treasurer/Secretary

Paul Shadura
Commercial fishing interest groups

Molly McCammon
Municipality of Anchorage



James Showalter
Alaska Native organizations

Grace Merkes
Kenai Peninsula Borough

Bob Shavelson
Environmental interest groups

Rob Lindsey
City of Kodiak

Carla Stanley
City of Homer

John French
Aquaculture associations

Mary Jacobs
Kodiak Island Borough

Robert Peterkin II
State Chamber of Commerce

Staff

Michael Munger
Executive Director

Karen Williams
Assistant Executive Director

Susan Saupe
Director of Science and Research

Stephen Howell
Director of Public Outreach

Terrance Bryant
Director of Operations

Cara Steadman
Administrative Assistant

Projects

Donna McCoy

PROPS Projects

Geographic Resource Information Network

One of Cook Inlet RCAC's newest projects in 2005 was the Geographic Resource Information Network, or GRIN, designed to address logistical needs beyond just basic equipment and personnel for oil spill response. As the M/V *Selandang Ayu* spill and Hurricane Katrina illustrated, a wide range of information is needed and some response personnel may arrive at the scene unfamiliar with the local conditions and resources.

The GRIN provides reference information on resources, capabilities, and infrastructure along Alaska's coastal communities. This is accomplished by taking existing information from multiple sources, supplementing the information as needed, and compiling electronic and paper documents. A completed GRIN allows users to easily locate and view logistical information relevant to oil spill response in coastal Alaska.

The first days of a response are critical and spending that time gathering basic logistic, safety, and contact information can frustrate personnel and diminish the effectiveness of the response. Much of the information compiled in GRIN is available publicly through web sites, phone directories, and local emergency response manuals. However, GRIN improves on this by sifting through the information and compiling it in a familiar form that matches four sections of the Incident Command structure used in a response – Logistics, Safety, Public Information, and Liaison.

Nuka Research & Planning Group

The GRIN web site centralizes information used in the initial response during a crisis such as an oil spill.

Logistical information includes many of the categories currently included in the Subarea Plan, such as transportation information, availability of support facilities and emergency contact phone numbers for local officials. The Safety section includes information concerning firefighting, police and medical resources. The Public Information section provides references and resources that would assist the Incident Command in contacting appropriate media outlets, scheduling and conducting press briefings and public meetings, and similar considerations. The Liaison section includes demographic, socioeconomic data specific to the community, names and telephone numbers of community leaders, city/town council members, and state representatives.

Instead of relying on text-only descriptions of resources, GRIN uses maps, photos, and diagrams to provide responders with a visual reference to accompany textual information.

Cook Inlet RCAC worked with a contractor to solicit industry and agency input and develop the prototype web site found at www.nukaresearch.com/grin. The final version of the GRIN will be available online and as a separate CD/DVD, both of which will provide easy, point-and-click access to key information and photographic and map-based references.

Donna McCoy

Permits Project

Oil spills are paperwork intensive events and sometimes the process can slow a response unnecessarily. Cook Inlet RCAC initiated the Alaska Oil Spill Permits, Forms, and Applications Project to minimize the paperwork required and thereby speed the response. This project identifies all forms and permits required to carry out an effective spill response and provides a computer-based tool that will aid responders during an oil spill or drill. The Permits Project tool launched in 2005 after the workgroup reviewed each of the forms, tested links, and improved some of the computer navigation.

Cook Inlet RCAC and others on the workgroup revised state permits as needed, removed redundant permit requirements, and centralized all permits. Cook Inlet RCAC ultimately expects the product to be included in the Alaska Federal/State Preparedness Plan for Response to Oil and Hazardous Substance Discharges/Releases Unified Plan.

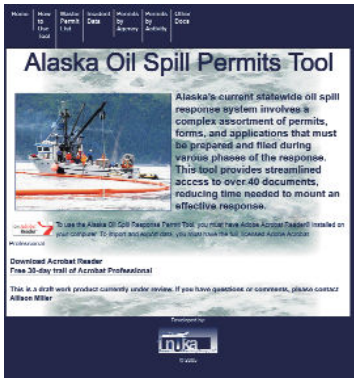
Director of Public Outreach Stephen Howell and John Kwietniak of Tesoro presented the project at Alaska Regional Response Team meetings in Anchorage and the Local Emergency Planning Committee meeting in Kodiak to make users aware of its benefits. Representatives also presented information on the project at the 2005 Pacific States/BC Task Force meeting in Anchorage. More recently, responders have used the tool in spill response exercises at CISPRI in an effort to guage its effectiveness. Visitors can use the tool at www.nukaresearch.com/permits.

Pipeline Integrity

Cook Inlet RCAC commissioned a report in 2005 on the status of all subsea pipelines and operators in Cook Inlet. After conducting interviews and reviewing and comparing data to industry and governmental standards and practices, Cook Inlet RCAC found that operators are using their subsea pipelines in a safe and compliant manner.

Given Cook Inlet's strong tidal currents, cold temperatures, and high concentration of dissolved oxygen – which can lead to corrosion – pipes must have external coating, and are also often stabilized with sandbags to prevent movement. Despite these precautions, there is potential for external corrosion, internal corrosion and physical damage to pipelines, which were focused on in the report. Most of the pipelines evaluated were built to handle larger volumes, higher pressures, and higher velocities than they currently experience due to diminished extraction over time and they continue to meet government and industry safety standards.

Each of the crude oil production companies in Cook Inlet provided information for the report and several made presentations at Cook Inlet RCAC meetings to describe their respective programs. One notable finding is that, with few exceptions, operators are using adequate data management, inspection monitoring, testing and reporting technology. Cook Inlet RCAC stresses that pipeline maintenance must remain an active issue, especially since some are nearly 40 years old. Our primary interest is in keeping oil in the pipelines and out of Cook Inlet.



Nuka Research & Planning Group

Alaska Oil Spill Permits Tool web site home page.

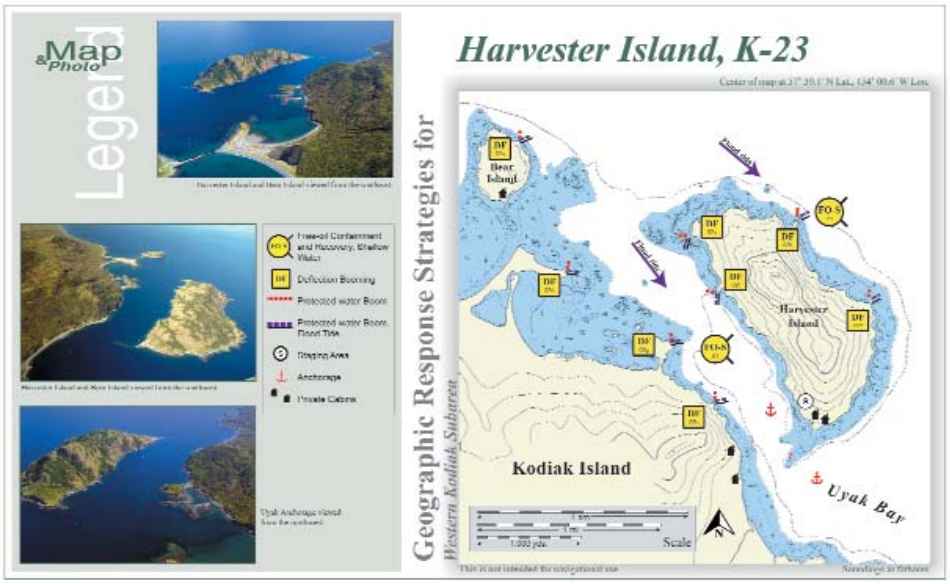
... pipeline maintenance must remain an active issue, especially since some are nearly 40 years old.

Top photos

Page 4: Intertidal biologist records species data, Kodiak Island.

Page 5: Feather duster worm, *Eudistylia* spp.

Donna McCoy



Nuka Research & Planning Group

This example of a GRS in the Kodiak region uses symbols and photos to help responders use spill response equipment effectively.

Kodiak GRS

Cook Inlet RCAC continues to protect salmon streams, wildlife habitat, bird rookeries and other environmentally sensitive sites through the development of Geographic Response Strategies (GRS) in the Cook Inlet region. The Kodiak GRS workgroup held its first meeting in March 2005 at the Fisheries Science Center in Kodiak. Over the summer, the workgroup identified five zones (northern, southern, eastern, western, and mainland) and an initial 25 sites in two of those zones for physical site surveys and GRS development.

GRS, tailored to protect a specific sensitive area from impacts following a spill, are well-known around Cook Inlet where 127 strategies have been completed for sensitive sites between Anchorage and Kodiak. These map-based strategies show responders where sensitive areas are located and where to place oil spill protection resources, steps that can save time during the critical first few hours of an oil spill response.

The steps for developing GRS for an area include:

- A workgroup convenes that includes agencies, industry, and community members who have responsibilities during oil spill response efforts;
- Workgroup participants identify sensitive areas that have the potential to be classified as "Areas of Major Concern" under criteria established in the governing oil spill response regulations, or Subarea Plan;
- Each site is evaluated based on its risk of being impacted by a spill on water and the feasibility of successfully protecting the site with existing technology;
- Based on feedback solicited from tribal representatives, user groups, and the public, the workgroup makes final site selections;
- Once site selection is complete, spill response professionals develop draft strategies for each site selected;
- The completed strategies are reviewed and approved by the entire workgroup who forward the final GRS to the appropriate Subarea Committee with the recommendation that they be adopted as part of the Subarea Contingency Plan. GRS are not considered final until they have been approved by the Subarea Committee.

Donna McCoy

For the Kodiak region, the workgroup initially identified 166 possible sites around Kodiak and Afognak islands and determined that by breaking the region into zones they could manage the task and focus on high priority locations within each zone. The workgroup then identified 11 high priority sites from the Northern zone, which consists of the Northwestern side of Afognak Island, and 14 sites from the Western zone, which consists of the Western side of Kodiak Island. The workgroup expects to identify sites within the other zones as funding becomes available. A zone map and other Kodiak GRS information are posted at http://www.state.ak.us/dec/spar/perp/grs/ki/home.htm.

When identifying GRS sites, public involvement is essential to ensure that the sites selected and the strategies developed reflect the environmental protection priorities of local villages, stakeholders, and resource users. To accomplish this in the Kodiak region, Cook Inlet RCAC coordinated visits to Larsen Bay, Port Lions, and Ouzinkie to give presentations on GRS and to solicit comments, answer questions, and gather information on sites important to the local communities. Director of Public Outreach Steve Howell, Cook Inlet RCAC Board Member James Showalter, Kodiak Area Natives Association representative Iver Malutin, Prince William Sound RCAC Community Liaison Linda Robinson, and Nuka Research representative Mark Janes flew to each of the villages and met with local residents and tribal leaders.

Command Change

Captain Ronald J. Morris retired from the U.S. Coast Guard and his position as Commanding Officer of the Marine Safety Office in Anchorage following a presentation of colors, inspection of troops, reading of the watch, and several other traditions. The Change of Command ceremony also welcomed Captain Mark DeVries to the position. Executive Director Michael Munger and Cook Inlet RCAC President Doug Jones attended the event at the Alaska Native Heritage Center and presented Captain Morris with an appreciation gift and a copy of the Council resolution thanking him for his service.

Captain Morris enlisted in the Coast Guard in 1972. His first tour of duty was on the icebreaker *Northwind* followed by a tour at the Air Station Port Angeles, WA before being commissioned in 1975. He served in Portsmouth, VA; Buffalo, N.Y.; and New Orleans, LA where he attended college at night during his tour, receiving his B.S. in Business Administration and Management. Later he worked in Yorktown, VA; Juneau; Cleveland, OH; Valdez; and New Orleans, LA where he served as the Western Rivers Coordinator over all or part of 26 states.

Captain DeVries reported to the MSO-Anchorage having just completed a two-year tour in the Middle East as the Officer-in-Charge, Maritime Liaison Office Bahrain and Marine Safety Special Assistant to Commander Naval Forces Central Command. He returned to Anchorage where he previously served as the Executive Officer from 1997-2000. Cook Inlet RCAC appreciates working with Captain DeVries and his staff to promote safe marine transportation and facility operations in Cook Inlet.

Courtesy of USCG

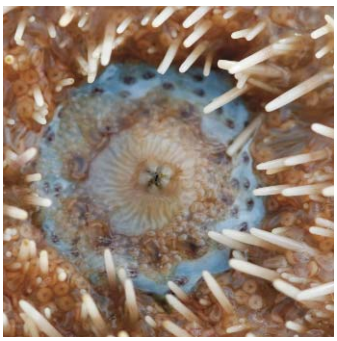
U.S. Coast Guard Command Change. Rear Admiral James C. Olson (right) during the ceremony for retiring Captain Ronald Morris (center) and his replacement, Captain Mark DeVries.

Top photos

Page 6: Shorezone aerial survey team resupplying the beach team.

Page 7: Sediment tide pool observed during coastal mapping.

Terrance Bryant



Donna McCoy

Sea urchin detail.

Spills and Drills

Oil spill drills are an important response planning tool, as they maintain familiarity with equipment, procedures, and roles within the Incident Command System. These drills have not always been the active prevention tool that they are today in Cook Inlet. In the years following the *Exxon Valdez* oil spill, regulators clarified expectations for all oil spill responders and response organizations developed their own internal protocols. Cook Inlet RCAC adds to these efforts by evaluating the adequacy of Unified, Subarea and industry contingency plans, identifying areas needing improvement, and working with industry to conduct drills of the plans. These drills are highly effective in testing industry's contingency plans and scenarios and by collaborating with Alaska Department of Environmental Conservation, Cook Inlet RCAC monitors incident command effectiveness and contingency plan adherence.

In 2005, Cook Inlet RCAC monitored and evaluated oil spill drills conducted by ConocoPhillips, Marathon Oil, Forest Oil, Cook Inlet Pipeline, and Tesoro Alaska. During these drills, Cook Inlet RCAC integrated our personnel into the various sections within the Incident Command System. These opportunities also allow us to continue to refine our own protocols for providing clear communication to our constituency.

Tanker towing exercises present special challenges due to weather and inherent dangers of large vessel maneuvers at sea. Cook Inlet RCAC encourages these extensive field deployments to test strategies. In 2005, Marathon Oil Company drilled to a scenario that centered on a disabled LNG tanker in Cook Inlet. The exercise included a fictional fire aboard the *Arctic Sun* in the engine room that resulted in the loss of propulsion and injured five personnel. A combined Marathon and Conoco/Phillips emergency response team addressed the scenario, hooking up and towing an LNG tanker, among other measures.

Steve Ebbert, USFWS

Soybean freighter *Selendang Ayu* aground near Dutch Harbor in late 2004.

Donna McCoy

C-Plan Review

The Protocol Committee, comprised of five members of the Board of Directors, deals with state and federal related issues with time-sensitive comment periods. Cook Inlet RCAC has a mandate in OPA 1990 to review contingency plans – the action plan a responsible party would take to address a spill – for the regulated crude oil industry in Cook Inlet.

Representing the public's interest, Cook Inlet RCAC works with state agencies and industry during plan review to reinforce their importance to protecting Cook Inlet's productive waters. Since the State of Alaska lengthened the effective period for contingency plans from three to five years, a thorough review of these plans is especially important to the health of the Inlet.

Cook Inlet RCAC developed and submitted comments on several State of Alaska Oil Discharge Prevention and Contingency Plans (ODPCP) for Cook Inlet Operators during 2005. Cook Inlet RCAC's comments focus on ways to improve contingency plans and existing spill response planning measures to reduce the risk of oil discharges to Cook Inlet.

Cook Inlet RCAC submits comments to the Alaska Department of Environmental Conservation (ADEC) and, in many cases, Cook Inlet RCAC requests have resulted in marked improvements to Cook Inlet operator contingency plans.

Cook Inlet RCAC commented on the following Contingency Plans in 2005:

- Forest Oil Corporation Cook Inlet Area Exploration Operations
- Aurora Gas, LLC Cook Inlet Area Production Operations
- Kenai Pipeline Company
- Union Oil Company of California (Unocal) Cook Inlet Vessel Operations

In June 2005, Cook Inlet RCAC also submitted comments to ADEC on proposed changes to the state regulations governing the prevention requirements for state contingency plans. Cook Inlet RCAC's highest priority issue was to develop stricter prevention standards for gathering and flow lines, which are largely unregulated by the state and federal governments. Revised regulations were published in September 2005, including many of the measures recommended by Cook Inlet RCAC. Cook Inlet RCAC submitted additional comments to ADEC in November 2005, expressing support for the new gathering and flow line regulations and for improved secondary containment requirements, among others. Cook Inlet RCAC recommended that additional regulations be developed to address vessel mooring systems, spot charter vetting procedures, and winter ice operating procedures, among others.

Cook Inlet RCAC has a mandate in the Oil Pollution Act of 1990 to review contingency plans, the action plan a responsible party would take to address a spill...

Top photos

Page 8: A "vessel of opportunity" tows ocean boom during a oil spill drill in Kachemak Bay.

Page 9: Clam, mussel, and barnacle shells.

Steve Howell

While many of the land-based firefighting skills translate to the marine environment, some of the equipment, procedures, and safety considerations do not.

Cook Inlet Marine Firefighting

Major marine fires need special consideration, particularly vessel fires which may require resources beyond those locally available. While many of the land-based firefighting skills translate to the marine environment, some of the equipment, procedures, and safety considerations do not. Upon arrival, a team may find volatile fuels on the water requiring special retardants and high-powered equipment. An effective response may also require resource deployment coordination among a broad range of organizations. The Marine Firefighting and Salvage Plan project assumes these challenges and suggests that this coordination requires pre-incident planning.

To address this need for pre-incident planning, Cook Inlet RCAC promoted a design similar to a contingency plan that identifies the means and methods necessary to access federal, state, and local resources. Like GRS, the process is also workgroup driven and in 2005, Cook Inlet RCAC submitted the product to the Cook Inlet Committee for Oil and Hazardous Materials Contingency Plan. Cook Inlet RCAC expects the plan to be included in the Cook Inlet Subarea Plan.

The firefighting manual provides for a coordinated response by the U.S. Coast Guard and other federal, state, local, and civilian responders to fires onboard vessels or at waterfront facilities. Cook Inlet RCAC and the workgroup integrated relevant policies into the manual as well as procedures for coordination of on-scene responders including community profiles and capabilities, response resources, command and control, initial response and other areas of concern.

Steve Howell

Incident response personnel review dock and ship drawings during a marine firefighting drill in Nikiski.

One of the proponents of the manual, Tesoro Alaska, conducted a drill as part of their internal exercise program that included use of the manual. The exercise centered around a tanker pump room explosion and fire that eventually exceeded the vessel's firefighting capabilities prompting a call for outside assistance. Drills such as these provide valuable feedback on the manual's effectiveness.

The Cook Inlet Marine Firefighting Manual is available on the web at www.circac.org/library.html.

Donna McCoy

EMC Projects

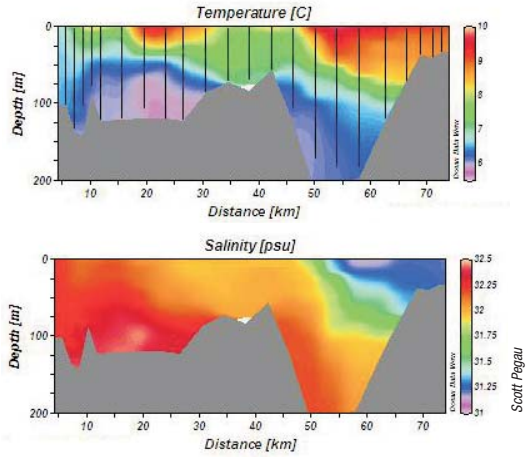
Physical Oceanography Program

Physical oceanography data collections are high priority for fulfilling Cook Inlet RCAC's goals to better understand the potential transport of surface oil, dispersed oil, sediment plumes, or contaminant plumes in Cook Inlet. To improve our ability to predict these transports, observational data are needed to enhance numerical modeling efforts. Water transport is driven by various currents such as tidal and density currents. Data that improve our understanding of these currents are essential to understanding the movement of oil spills or other pollutants into, within, or out of Cook Inlet. Cook Inlet RCAC is working hard to promote these data collections in Cook Inlet and to partner with other research organizations to fill the data gaps as described below.

Cook Inlet Physical Oceanography Workshop

Nearly 100 participants joined Cook Inlet RCAC, the Kachemak Bay Research Reserve (KBRR), and the Alaska Ocean Observing System (AOOS) for their "Cook Inlet Physical Oceanography Workshop" in February at the Alaska Islands and Oceans Visitors Center in Homer. The major goals for the workshop were to provide descriptions of on-going research and monitoring in Cook Inlet waters and to assess the needs and generate ideas for valuable products and services to aid mariners, scientists, industry, resource managers, educators, and other users of marine resources.

Guest speakers came from as far away as the Jet Propulsion Laboratory in southern California to share information on new technology systems for data collection, observation, and modeling. Dr. James Schumacher of Two Crow Environmental compiled the final proceedings for the event, which are available through Cook Inlet RCAC and AOOS. The workshop also provided opportunities for coordination and integration of research, monitoring, and modeling efforts which will be essential in developing the Cook Inlet portion of an AOOS. AOOS is the Alaska component of a growing national network of integrated ocean observing systems that will improve our ability to rapidly detect changes in marine ecosystems and living resources, and predict future changes and their consequences.



Scott Pegau

Temperature and salinity along a transect crossing Kennedy Kennedy (right side of graph) and Stevenson (left side of graph) entrances in lower Cook Inlet. The data show cold and saline water being upwelled near Shuyak Island (left side of graphs).

All of the physical oceanography programs together, if carefully integrated and communicated between and among researchers, modelers, and user-groups, can help us provide the best tools for predicting water movement in Cook Inlet and potential oil spill or underwater plume trajectories.

Top photos

Page 10: A responder fills a 2500 gallon portable tank during a marine firefighting drill.

Page 11: The hood of a lion nudibranch, *Melibe leonina*.

Donna McCoy

http://visibleearth.nasa.gov

Location of transect where temperature and salinity profiles are providing information about density-driven currents in Cook Inlet and at its boundaries.

Hydrographic Surveys

In 2004 and 2005, hydrographic surveys have been conducted along five Cook Inlet transects (figure at left) where ocean water enters or exits Cook Inlet, where major river systems enter the upper Inlet, and where major parts of Cook Inlet meet in the central Inlet and the mouth of Kachemak Bay.

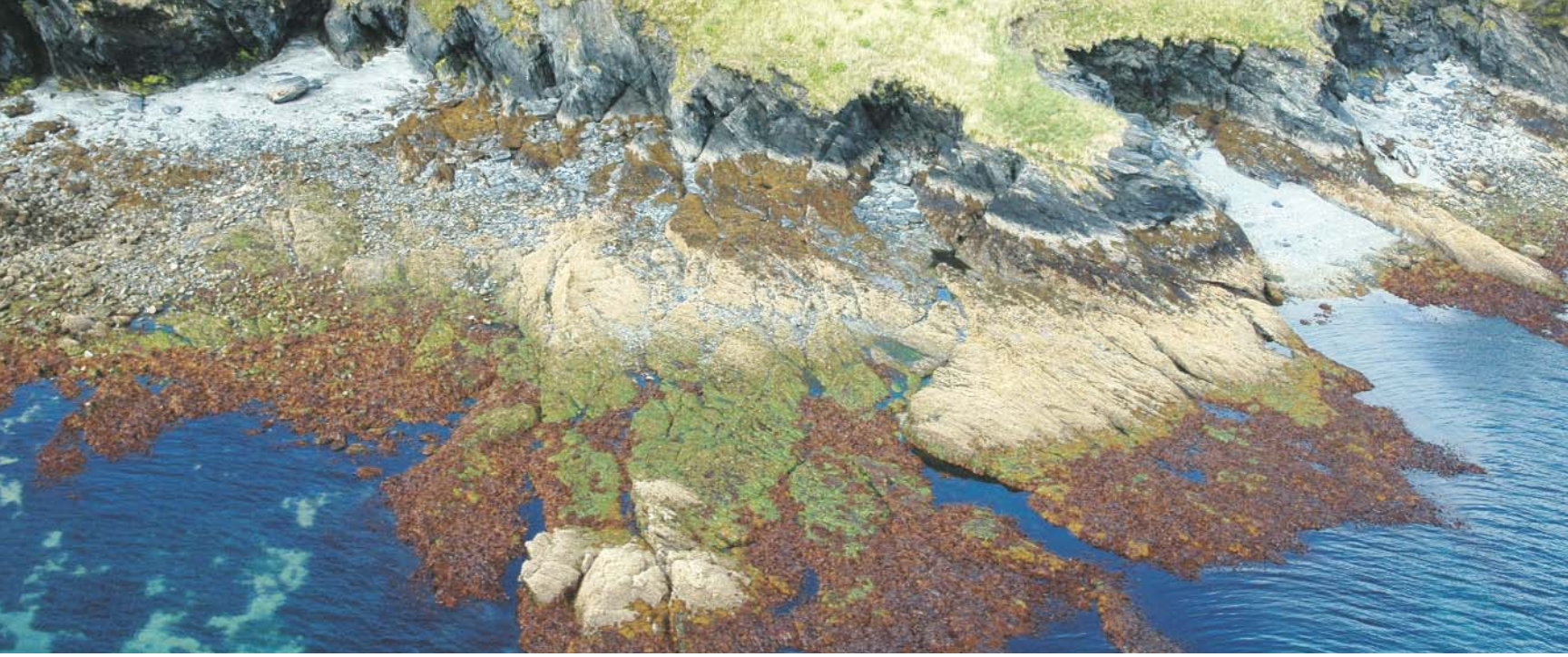
For each survey, Dr. Scott Pegau of the KBRR and Dr. Steve Okkonen of UAF collected data on temperature, salinity, dissolved oxygen, and transmissivity (a measure of suspended sediments). These collections provide information on several major freshwater sources to Cook Inlet, such as the Alaska Coastal Current and upper Cook Inlet glacial rivers. Freshwater influxes to coastal waters can drive "net" currents, or currents that determine longer-term transport pathways of water masses or contaminants.

The results indicate a seasonal component to how strongly the Alaska Coastal Current influences lower Cook Inlet, with minimal water exchange in the winter and early spring and greater exchange during the summer.

The data also show a cold, high-salinity water mass in Stevenson Entrance (figure on previous page), indicating an upwelling component near northern Shuyak Island. Upwelling brings nutrients to the surface, important for phytoplankton growth and subsequent carbon supply to the marine food web, and the area north of Shuyak Island is known for its rich ecosystem. Recent coastal surveys in the area (described below) indicate that this upwelling may also influence the intertidal zone since the biomass and diversity of seaweeds were some of the highest seen for the Kodiak area.

Satellite Drifter Buoys

Cook Inlet RCAC purchased additional drogued satellite drifter buoys to support an MMS and UAF project by Dr. Mark Johnson titled "Water and Ice dynamics in Cook Inlet." A drogue is an underwater sail that creates resistance to seawater movement and, when suspended at a specific depth, helps determine the set and drift of the current at that depth by tracking the movement it gives the surface buoy. Each buoy beams a signal to satellites so that researchers can track them over time. Cook Inlet Spill Response, Inc. has also supported this project by releasing and retrieving many of the buoys. The data from these buoy deployments are instrumental in validating a three dimensional circulation model being developed by Dr. Johnson's team.



Mary Morris

Coastal Habitat Mapping

A team of scientists worked together for a total of 20 days in May and June to support Cook Inlet RCAC's project to survey and map coastal habitat on Kodiak and surrounding islands. The scientists worked in teams to conduct concurrent aerial surveys using helicopters and airplanes and shore-based surveys using boats. These surveys combine with those from earlier years to provide detailed biophysical data for intertidal and shallow subtidal areas of Cook Inlet and surrounding areas.

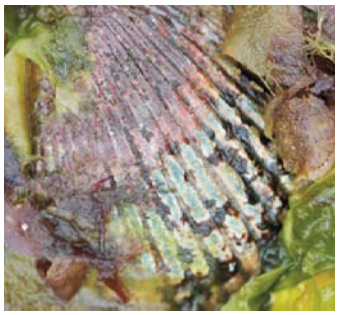
The aerial survey team, led by Cook Inlet RCAC contractors Dr. John Harper of Coastal and Ocean Resources, Inc. and Mary Morris of Archipelago Marine Resources, Ltd., used a helicopter flown by Kodiak pilot Tom Walters. This survey team provided digital imagery and information about the geology, morphology, and biology of the shorelines of Kodiak, Afognak, Shuyak, Sitkinak, Tugidik, Sitkalidak, Marmot, Spruce, Raspberry, and many other smaller islands. The digital imagery is available on the web at www.coastalaska.net, a website that allows you to virtually fly along Kodiak's coast, as well as other shorelines in the Gulf of Alaska surveyed in earlier years.

Concurrently, Cook Inlet RCAC's Director of Science and Research, Susan Saupe, led a vessel-based shore-station survey team throughout the islands. A total of 113 sites were sampled for detailed invertebrate and algal species-level information and 160 sites were visited to provide up-close geomorphology data and validate mapping done by for the aerial survey team.

The team conducted their work from the Kodiak-based R/V *Island C.*, a local Kodiak charter vessel. Owner Jack King and his experienced crew provided invaluable local input, which gave the scientists a 100% success rate in accessing sampling sites. Members of the team included expert taxonomists Drs. Sandra Lindstrom and Allan Fukuyama, who provided detailed voucher collections. Mandy Lindeberg, from NMFS's Auke Bay Lab in Juneau, compiled thousands of high resolution species-level photographs during the survey and is developing a web-based illustrated dictionary of seaweeds documented during Shorezone intertidal surveys. Dr. Carl Schoch traveled hundreds of miles by skiff to map coastal geomorphology at more than 160 sites. Several additional field crew measured beach profiles, mapped species locations, or provided GIS mapping expertise and included Dr. Jodi Harney, Heather Anderson, Robyn Fyles, Neil Borecky, and Sheri Ward.

Cook Inlet RCAC had a special opportunity to work with a professional intertidal photographer by providing bunk space on the research vessel. Donna McCoy's images have been provided to Cook Inlet RCAC for use in the public outreach. Several of those images grace Cook Inlet RCAC's office walls and can be seen in this report.

The scientists worked in teams to conduct concurrent Shorezone projects: aerial surveys using helicopters and shore-based intertidal sampling and coastal mapping validation using boats.



Donna McCoy

Cockle shell.

Top photos

Page 12: Dr. Carl Schoch conducts geomorphology surveys in Kodiak.

Page 13: Rocky reef habitat showing intertidal biobands mapped for Kodiak Shorezone project.

Donna McCoy

Interesting Results

The information from the aerial surveys is currently being interpreted and systematically recorded into a database linked to digital shorelines that can then be used to produce maps of various shoreline features. While turning the survey data into mapped data, the scientists have reported that Kodiak's shorelines are very diverse and in short distances can cover many different coastal habitat classes and exposures, making this dataset especially interesting and challenging.

Susan Saupe

Giant Green Sea Anenome, *Anthapleura xanthogrammica.*

During the summer surveys, the researchers documented two examples of a major range extension for the kelp *Macrocystis integrifolia* on Afognak and Kodiak Islands. Prior to the Shorezone surveys, this kelp had not been documented in the area as attached kelp, although drift specimens have been collected historically. The new beds were initially documented from the helicopter. The largest bed on Afognak Island was mapped in more detail using skiffs and GPS and collections were made for vouchers and DNA analysis.

Preliminary results from the 2005 summer surveys also indicate that beaches in the northern Shuyak Island area had some of the richest seaweed communities. These areas are near the upwelling area documented during the Hydrographic Survey Project (described earlier) which may be providing extra nutrients needed by seaweeds to grow.

Background Metals

In 2004, a pilot project was conducted by Cook Inlet RCAC to improve our understanding of natural metal inputs to Cook Inlet from watershed sources. Through a contract with Dr. Christopher Guay, water samples for metals analyses were collected in March (low-flow conditions) and September (high-flow conditions) from seven Cook Inlet watershed/estuary systems encompassing a wide range of physical and geological domains: the Matanuska, Kenai, Kasilof and Anchor rivers, and small rivers leading into Seldovia Bay, Chrome Bay, and Port Chatham. Analyses were done for dissolved, particulate, and colloidal metal fractions in each watershed. The results provided to Cook Inlet RCAC in 2005 demonstrated a large degree of variation in metal concentrations among the rivers, with significant spatial and seasonal variability and differences between colloidal and truly dissolved fractions observed within the individual rivers. Cook Inlet RCAC is expanding this project to other watersheds and to higher sampling frequencies in several rivers.

Donna McCoy

Samples from watersheds on the southern Kenai Peninsula (Chrome Bay, Port Chatham, and Seldovia) contained very high concentrations of chromium (Cr) and nickel (Ni) relative to samples from the other watersheds. This result matches with the high concentrations of Cr and Ni found in marine sediments on the southern Kenai Peninsula during the National Coastal Assessment project described below.

National Coastal Assessment Program

Cook Inlet RCAC continues to partner with the Alaska Department of Environmental Conservation (ADEC) to provide results from Alaska's first component of a National Coastal Assessment Program funded by the Environmental Protection Agency. Susan Saupe was Chief Scientist for the initial sampling program that took place in 2002, and was lead author of the final report completed after laboratory and statistical data were received from national laboratories in 2005. ADEC will release the final report, titled "National Coastal Assessment Program: The Condition of Southcentral Alaska's Bays and Estuaries Technical Report and Statistical Summary," to the public in spring 2006.

The report summarizes sediment and water quality data for coastal waters from the Alaska Peninsula to Prince William Sound and includes information such as sediment and fish tissue contaminant concentrations, taxonomy and counts of of sediment-dwelling organisms, sediment toxicity, and numerous water column indicators such as dissolved oxygen, nutrients, and suspended sediments.

Based on the indices used during the study, ecological conditions in south-central Alaska bays and estuaries are considered good. Sediment contaminant levels fell below concentration known to cause detrimental effects to sediment-dwelling organisms at over 98% of the area. Higher levels for some metals were found in several bays, such as the high chromium concentrations found in Chrome Bay. There was little indication of elevated levels of organic contaminants in the sediments or of sediment toxicity. Dissolved oxygen, chlorophyll-a concentrations, and levels of nitrogen are considered good. Based on the water clarity indicator, some areas of south-central Alaska estuaries have poor light penetration, which is often an indicator of degraded water quality in other areas. For these areas of Alaska, however, all incidences of low water clarity were due to high glacial silt loads naturally introduced to nearshore waters.

Ballast Water/Non-Indigenous Species (NIS)

In 2005, through a cooperative agreement with the U.S. Fish and Wildlife Service, Cook Inlet RCAC received funding to develop a ballast water sampling project for ships transiting the north Pacific. Cook Inlet RCAC has developed an agreement with the Smithsonian Environmental Research Center and shipowner Marathon Oil Company to sample and analyze treated and untreated ballast water originating in Japan. Sampling will take place during the spring and summer of 2006.

Donna McCoy

Intertidal barnacles.

Top photos

Page 14: Intertidal sampling team selects sites during Kodiak Shorezone surveys

Page 15: Intertidal Hermit Crab, *Pagurus alaskensis*

Neil Borecky

Linda Robinson

A staff member demonstrates Shorezone Mapping tools on the CoastAlaska.net web site.

Each year, Cook Inlet RCAC staff and volunteers attend conferences to educate the public on oil production and transportation issues affecting Cook Inlet as well as bringing new information back to the organization.

Top photo: Dr. Allan Fukuyama collects invertebrate species data, Shark Point, Ugak Bay, Kodiak Island.

Conferences

Each year, Cook Inlet RCAC staff and volunteers attend conferences to educate the public on oil production and transportation issues affecting Cook Inlet as well as bringing new information back to the organization. A brief summary of some of these activities follows.

In January 2005, Susan Saupe presented a summary of the Environmental Monitoring and Assessment Program (EMAP) program that she conducted with ADEC to characterize southcentral Alaska's coastal water and sediment quality. Her presentation at the Anchorage Marine Sciences Symposium focused on the development of the program and the initial analytical results.

Cook Inlet RCAC Director of Public Outreach Stephen Howell, Board Member Rob Lindsey, and PROPS Committee Member Barry Eldridge attended the spring 2005 International Oil Spill Conference (IOSC) in Florida, which was co-sponsored by the U.S. Coast Guard. Board and committee members attended a variety of sessions on issues related to spill prevention and response to learn about innovations and initiatives within the industry. Representatives from other area organizations also attended including Nuka Research, Tesoro Alaska, Alaska Chadux, CISPRI, Prince William Sound RCAC, and ADEC. Three Cook Inlet RCAC staff members served on IOSC planning committees reviewing papers submitted on oil spill prevention and clean-up technologies.

Cook Inlet RCAC Director of Operations Terrance Bryant and Assistant Executive Director Karen Williams attended the annual Arctic and Marine Oil Spill Program (AMOP) held by Environment Canada. The technical conference often highlights new developments in oil spill response in cold climates and during this year's conference, Mr. Bryant presented the Alaska Oil Spill Permits, Forms and Applications project (described elsewhere in this report).

Early in 2005, Alaska Governor Frank Murkowski appointed Cook Inlet RCAC Executive Director Michael Munger to a committee within the Interstate Oil and Gas Compact Commission (IOGCC). The IOGCC, which held its midyear meeting in July in Anchorage, is an organization of states that promotes conservation and efficient recovery of domestic oil and natural gas resources while protecting health, safety and the environment. The committee on which Mr. Munger serves, the Environmental and Safety Committee, is a national forum for oil and gas issues and gathers information on legislative, regulatory, and technological developments. More information on the IOGCC, can be found at http://www.iogcc.state.ok.us.

The Newfoundland and Labrador Environmental Industry Association invited Cook Inlet RCAC Director of Science and Research Susan Saupe to a November gathering of oil spill response experts in St. John's, Newfoundland. The conference theme was "Integrated Approach to Oil Spill Preparedness and Response" and focused on integration models from several countries. Ms. Saupe was asked to discuss the various tools and resources that Cook Inlet RCAC brings to Incident Command during oil spills and drills. She also participated as a paneliest during a role-playing exercise for a large spill into Newfoundland coastal waters. The goal of the drill was to have each international participant play the role as they would in their own area to see how it might apply within the Canadian response system.

Charter Funding Companies

- Cook Inlet Pipeline Company
- Forest Oil
- Marathon Oil Company
- ConocoPhillips
- Tesoro Alaska
- Unocal
- XTO Energy

Additional Funding Sources

- Kenai Peninsula Borough
- Exxon Valdez Oil Spill Trustee Council
- Coastal Marine Institute (University of Alaska Fairbanks and Minerals Management Service)
- National Oceanic and Atmospheric Administration
- U.S. Fish and Wildlife Service
- Prince William Sound Tanker Group
- Alaska Department of Natural Resources, Coastal Impact Assistance Program
- Alaska Department of Environmental Conservation

Project Partners

- Prince William Sound RCAC
- National Park Service
- Alaska Ocean Observing System
- Donna McCoy Photography
- National Marine Fisheries Servies - Auke Bay Lab
- CISPRI - Cook Inlet Spill Prevention & Response, Inc.
- Oil Spill Recovery Institute
- Kachemak Bay Research Reserve
- Tesoro Alaska
- Union Oil Company of California

Contractors

- Coastal and Ocean Resources, Inc.
- Archipelago Marine Research, Ltd.
- Dr. Sandra Lindstrom
- Dr. Alan Fukuyama
- Maritime Helicopters and Andrew Airways
- Island C. Research
- Nuka Research and Planning Group, LLC

Reports and Publications

The following reports were developed or published during 2005:

"DR&R: Dismantling and Removal of Offshore Oil and Gas Platforms and Restoration of the Impacted Environment in Alaska's Cook Inlet." By Ann Rothe, Nuka Research and Planning Group, LLC, February 2005, for Cook Inlet Regional Citizens' Advisory Council.

"A Review of 2004 Cook Inlet Nontank Vessel Contingency Plan Project Activities and Recommendations for Future Actions." By Nuka Research and Planning Group, LLC, May 16, 2005, for Cook Inlet Regional Citizens' Advisory Council.

"Taming the Oil Spill Paperwork Beast: The Alaska Oil Spill Response Permits Project." By Elise DeCola and Tim Robertson, Nuka Research and Planning Group, LLC; Terry Bryant, Cook Inlet Regional Citizens' Advisory Council; and Gary Folley, Alaska Department of Environmental Conservation, 2005. Published in Proceedings of the 2005 International Oil Spill Conference.

"Streamlining the Oil Spill Permitting Process for Wildlife Response and Other Activities in Alaska." 2005 Effects of Oil on Wildlife Conference. By Terry Bryant, 2005. Cook Inlet Regional Citizens' Advisory Council.

"Hydrography of Lower Cook Inlet." By W. S Pegau, S. Saupe, S. Okkonen, and M. Willette, 2005. Published in Cook Inlet Physical Oceanography Workshop Proceedings, edited by Two Crow (Aka J. D. Schumacher). Final report submitted to Cook Inlet Regional Citizens" Advisory Council.

"Hydrography of Central Cook Inlet." By S. Okkonen, 2005. Published in Cook Inlet Physical Oceanography Workshop Proceedings, edited by Two Crow (aka J. D. Schumacher). Final report submitted to Cook Inlet Regional Citizens' Advisory Council.

"Observations of Hydrography in Central Cook Inlet, Alaska, during Diurnal and Semidiurnal Tidal Cycles and Physical Measurements and Seasonal Boundary Conditions in Cook Inlet." By S. Okkonen, 2005. Published in Proceedings of the Tenth MMS Information Transfer Meeting and Barrow Information Update Meeting. OCS Study MMS 2005-036. Prepared by MBC Applied Environmental Sciences, Costa Mesa, CA. for the U.S. Dept. of the Interior, Minerals Management Service, Alaska OCS Region, Anchorage, AK.

"National Coastal Assessment Program: The Condition of Southcentral Alaska's Bays and Estuaries Technical report and Statistical Summary." By S.M. Saupe, J. Gendron, and D. Dasher, 2005. A draft report submitted to Alaska Department of Environmental Conservation, Anchorage, AK.

"Aerial Video Imagine Surveys, Kodiak Island, Alaska (22-29 May & 21-24, 27 June 2005)." By Coastal and Ocean Resources, Inc., 2005. A Field report submitted to Cook Inlet Regional Citizens' Advisory Council, Kenai, AK.

"Kodiak National Wildlife Refuge, Kodiak Island, Afognak Island, Shuyak Island and Trinity Islands: Ground Station Survey (May 20-29th and June 20-27th 2005)." By Archipelago Marine Research, Ltd. 2005. A Field report to Cook Inlet Regional Citizens' Advisory Council, Kenai, AK.

Detail of a Pycnopodia sea star

Donna McCoy

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Dr. Jodi Harney surveys a coastal marsh on Kodiak Island

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