

*Trustee Council Use Only*

Project No: \_\_\_\_\_

Date Received: \_\_\_\_\_

**GEM PROPOSAL SUMMARY PAGE**

*(To be filled in by proposer)*

Project Title: Alaska Coastal Habitat Web Site

Project Period "FY 04-FY 05"

Proposer(s): Susan Saupe, Cook Inlet Regional Citizens Advisory Council (RCAC)  
Dr. John Harper, Coastal and Ocean Resources, Inc.

Study Location: Kenai Peninsula including Kachemak Bay and outer coast

**Abstract:**

This proposal is to develop an Alaska Coastal Habitat Web Site based on several products currently being produced using ShoreZone Mapping techniques. This proposal will tie together several components in a user-friendly, web-accessible format. In a recent workshop hosted by EVOS and attended by personnel from local, state, and federal agencies, universities, and not-for profit organizations, participants strongly endorsed a coordinated process for continuing coastal mapping and the wide-spread distribution of data through web accessibility. The group also emphasized that the data should be provided in a user-friendly way that will facilitate use by the general public.

This proposal outlines a plan to (a) make recently collected ShoreZone data immediately web-accessible, (b) combine ShoreZone mapping data with the existing Gulf of Alaska Coastal Imagery web site, and (c) combine ShoreZone mapping data with detailed site-specific data for various habitats and descriptions of biological assemblages and species.

The project will be coordinated by the Cook Inlet RCAC through a subcontract to Coastal and Ocean Resources, Inc. (CORI) who developed the ShoreZone techniques and who is currently conducting various ShoreZone mapping projects in the GEM area. CORI is located in Sidney, British Columbia, where much of the work will be conducted. The Public Outreach development portion will be conducted in Kenai at the Cook Inlet RCAC offices and community visits will take place at various places on the Kenai Peninsula as well as to resources agencies in Anchorage.

Funding:	EVOS Funding Requested:	FY 04	\$ 19,000	
		FY 05	\$	
		FY 06	\$	TOTAL: 19,000
	Non-EVOS Funds to be Used:	FY 04	\$ 15,000	
		FY 05	\$	
		FY 06	\$	TOTAL: 15,000

Date: 7 June 2003

## ***GEM RESEARCH PLAN: Alaska Coastal Habitat Website***

### ***I. NEED FOR THE PROJECT***

#### ***A. Statement of Problem***

There are a number of coastal habitat mapping initiatives that are ongoing within Alaska at the present time, including NOAA's Environmental Sensitivity Index (ESI) and numerous ShoreZone Mapping projects sponsored by Cook Inlet RCAC, the EVOS/GEM, the National Park Service, and NOAA's Essential Fish Habitat (EFH) group. In a recent workshop hosted by EVOS and attended by personnel from local, state, and federal agencies, universities, and not-for-profit organizations, participants strongly endorsed a coordinated process for continuing coastal mapping and the wide-spread distribution of data through web accessibility. The group also emphasized that the data should be provided in a user-friendly way that will facilitate use by the general public.

This proposed project will prepared a prototype product of ShoreZone Mapping from the Kenai Peninsula coast, including Kachemak Bay, and will make it available over the internet. More specifically, this proposal outlines a plan to (a) make recently collected ShoreZone data immediately web-accessible, (b) combine ShoreZone mapping data with the existing Gulf of Alaska Coastal Imagery web site, and (c) combine ShoreZone mapping data with detailed site-specific data for various habitats and descriptions of biological assemblages and species. The mapping data presentation will be such that average citizens can access GIS maps of specific biological resources or shoreline attributes and they can pull up the more specific data from which the maps were made.

Large areas of the Alaskan coastline remain unmapped and there is an identified need for consistent, GEM-wide (or larger) descriptions of shoreline habitats that will support the most informed decision-making by resource and coastal zone managers. Aerial video mapping using ShoreZone mapping techniques has been conducted for a significant portion of shorelines within the GEM area and provides geological (substrate, geomorphology), biological (flora, fauna) and anthropogenic attribute as part of an intertidal and subtidal environmental dataset. ShoreZone Mapping was used extensively in Washington state (Berry 2001, Bookheim 2001, Harper and Berry 2001), British Columbia (Howes 2001), and is currently being revised and applied in parts of coastal Alaska in the GEM area. This technique systematically characterizes shoreline morphology, substrate, wave exposure and biota.

At a recent EVOS Trustee Council funded nearshore mapping workshop, ShoreZone technology was selected as the recommended coastal mapping procedure for the GEM area for a number of reasons as described in the workshop summary: "It [ShoreZone] is already being widely used for a substantial portion of the oil spill area, with aerial videography and mapping either underway, already completed or planned in the nearterm for: Kenai Fjords/Seward (EVOS); middle and upper Cook Inlet, including Kachemak Bay, and the outer Kenai Peninsula coast (Cook Inlet RCAC); the northern Kodiak and Afognak Islands (EVOS and Cook Inlet RCAC); and Aniakchak and Katmai National Park coastlines (NPS). It is cost-effective, affordable, timely in generating data, and includes both biological and physical elements. It produces products with a wide range of applicability, such as a tightly geographically referenced aerial

video with narration, photographs, and both an attribute and spatial GIS database. It is a flexible system that can be tailored to a user's needs by selecting and combining desired attributes. It has been successfully tested elsewhere (Washington State, British Columbia). It follows a protocol which can be shared with all users, and which is being adapted for Alaska. Its products can be posted on the Internet and made widely available."

***B. Relevance to GEM Program Goals and Scientific Priorities***

Meaningful public and community participation is an essential component of the GEM Program (GEM Program Document, Chapters 1 and 3; NRC 2002). The GEM Science Plan (Draft, May 2003) identified community involvement as one of two key implementation strategies for GEM and states that the "data and results from GEM will need to be interpreted and disseminated in a comprehensive form to communities, organizations, and the general public."

In the EVOS Trustee Council FY2004 Invitation for Proposals, there was an invitation for proposals that would develop specific products such as targeted workshops, databases, maps, publications, and community science symposia that provide services to communities and stakeholders in the GEM region related to marine ecosystem health and sustainability. More specifically, the invitation identified a potential project for Coastal Mapping that would produce GIS maps of resources for specific coastal communities, building on mapping efforts already completed and underway.

This proposal is in response to that invitation and to a recommendation made at the recent EVOS Trustee Council sponsored workshop titled "Biological and Physical Mapping of the Shoreline in the Exxon Valdez Oil Spill Area, Alaska" by a group of over 25 participants from local, state, and federal agencies, as well as not-for-profit organizations, oil industry, and the GEM program's Science and Technology Advisory Committee Chair to "prepare a prototype product of ShoreZone mapping from a comprehensive geographic area, for example Cook Inlet or the Kenai Peninsula, and post it on the Internet."

By making ShoreZone mapping data accessible over the web to any user, without requiring specialized GIS software, we can ensure that the data is not limited in use to researchers or resource managers. The digital image accessibility tool allows anybody who has access to high-speed internet to view coastlines along the remote shorelines of the areas surveyed. For this proposal, those shorelines will be the remote coastlines of the outer Kenai Peninsula and including Kachemak Bay. These images will also be linked to GIS maps of data resources. Finally, the database will provide an educational tool about intertidal animals and algae by linking the ShoreZone mapping data with pictures of intertidal community assemblages and individual species.

The web site that is produced as part of this proposal will be coordinated with additional work being conducted by the Cook Inlet RCAC to promote the use of the web site and to develop school curricula based on the coastal data and images.

## ***II. PROJECT DESIGN***

### ***A. Objectives***

The overall goal of this proposal is to develop a prototype Alaskan Coastal Habitat Web Site that will use and integrate the various components of ShoreZone mapping projects. The initial web site development will focus on data collected from the Kachemak Bay and outer Kenai Peninsula regions and incorporate the various levels and types of data that have been collected to date; ShoreZone mapping data from the aerial surveys, digital coastal images, on-the-ground survey data, and detailed descriptions of invertebrate and algal assemblages and species.

The specific objectives of this proposed project are to:

- (a) post completed thematic ShoreZone map data on the web in a format that will allow use at regional and at local scales (i.e., scalable map data),
- (b) post completed ArcView map files and Access data files in a format suitable for downloading for use by more sophisticated users.
- (c) combine the mapping data with the Coastal Imagery player that allows users to “fly the coast” while looking at the map data.
- (d) provide an aerial videotape index map that allows users to identify VHS or digital tapes that they may wish to purchase for specific areas
- (e) provide an avenue for posting field inventory data and associated photos.
- (f) allow expansion to accommodate other electronic mapping data

### ***B. Procedural and Scientific Methods***

#### Web Site Development

The purpose of this proposed project is to provide a functional web site, established at minimal cost to accommodate wide-spread distribution of ShoreZone mapping data. To do so, we are proposing that a single website accommodate the data *and* the imagery and the site serve as a focus for reporting progress. This site would use a URL such as AlaskaCoastal.com or CoastAlaska.com. Establishment of an independent URL will facilitate transparency to the user should sponsorship of the site change.

#### Mapping Data

Experience of Washington Department of Natural Resources (WaDNR) researchers has shown that a few parts of the ShoreZone dataset are *widely used* (e.g., shore type, eelgrass and kelp distributions and shore-modification data account for approximately 90% of the use in Washington). A few users (~10%) require more detailed info within the dataset and *need the full functionality* of database searches and GIS. The following components address these two ranges of users:

- an ArcIMS mapping engine would be used to display a variety of thematic map products. Recommended thematic maps are listed might include wave exposure, major substrate types, oil residence index, biological habitat types, major biobands such as grasses, barnacles, blue mussels, various kelps and other algae, and eelgrass. The ArcIMS system provides a system where regional scale maps of 1:1,000,000 can be produced (Fig. 1) or where maps as detailed as 1:500 can be produced of the various map themes (Fig. 2). The ArcIMS data system is relatively easy to use and is likely satisfy most users.

- a download portion of the site will permit Arc users to access the complete spatial map data and the associated database files and meta data. The download portion of the site would include PDF versions of the Alaska ShoreZone Mapping protocol and other relevant summary documents. The full functionality of the Arc-compatible files should satisfy the most sophisticated users.

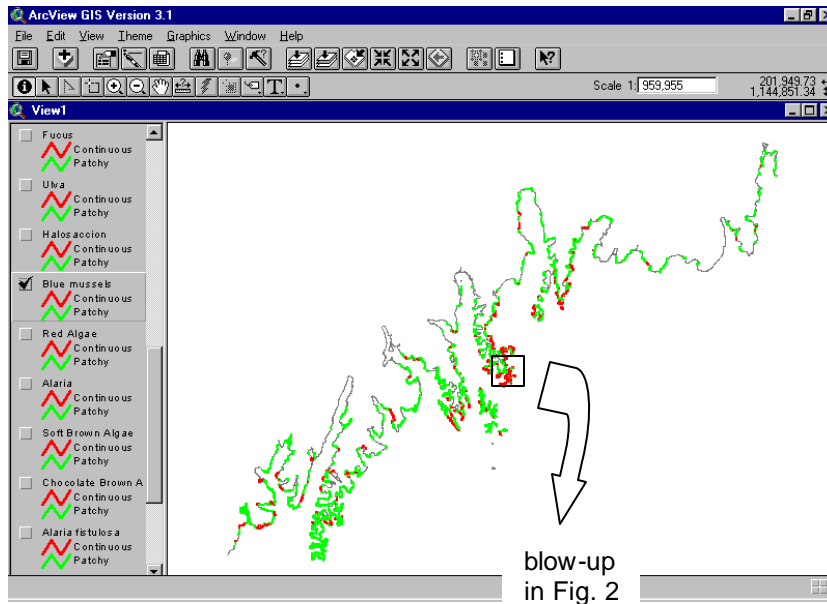
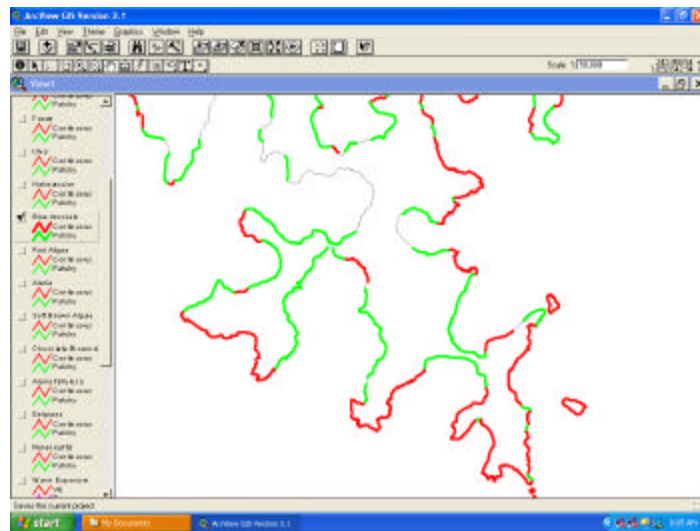


Figure 1 Example of proposed thematic data (blue mussel distribution in this example) that would be web-accessible through an ArcIMS web site. Map scale approximately 1:1,000,000.

Figure 2 A zoomed in view of the same theme (Blue mussels) as shown in Fig. 1 but at a scale of 1:50,000 showing distribution around the southern Aialik Peninsula.



### Coastal Imagery

In previous ShoreZone mapping projects funded by CIRCAC and by EVOS, coastal video imagery has been sampled and posted to an ArcIMS web site for viewing (Fig. 3). It is proposed that this viewing capability will be maintained on the same site and new imagery be posted as it

becomes available. This web site has proven to be functional and appeals to a wide range of users. The access to the site would be through CoastAlaska.com so the somewhat awkward Geocortex link will be eliminated. Three new additions to the site will provide improved functionality and access to imagery.

1. **Linkage of Imagery to Mapping Units** - a new addition to the site will allow a user to “click” on a section of coast while viewing data (e.g. Fig. 4) and “fly” that mapping unit.

2. **Higher resolution video clips** will be linked to the shoreline segment for areas of high interest or environmental sensitivity, and provided as either higher frequency of capture rates on the existing imagery site (e.g., sample 5-frames per second) or as a downloadable video file. These are relatively memory-intensive, but for a few specific areas, such as the mouth of the Kenai River, will provide more detail than what is presently available through the Imagery site here the digital video was sub-sampled once per second, or approximately every 28 frames.

3. **Videotape Identification and Ordering** - some users of the ShoreZone data have inquired about acquiring copies of the videotapes. ArcIMS maps would show the distribution of the videotapes, allowing a user to click on the area of interest and identify the associated videotape (Fig. 5). This could then link to an ordering and supplier system (not part of this proposal; it is suggested that an arrangement be setup with an existing distributor such as the Alaska Sea Grant Office, which presently has a videotape ordering and distribution system(see [http://www.uaf.edu/seagrant/Pubs\\_Videos/pubs/Forum-V.html#borrow](http://www.uaf.edu/seagrant/Pubs_Videos/pubs/Forum-V.html#borrow)). The video could be purchased in either VHS or digital format.

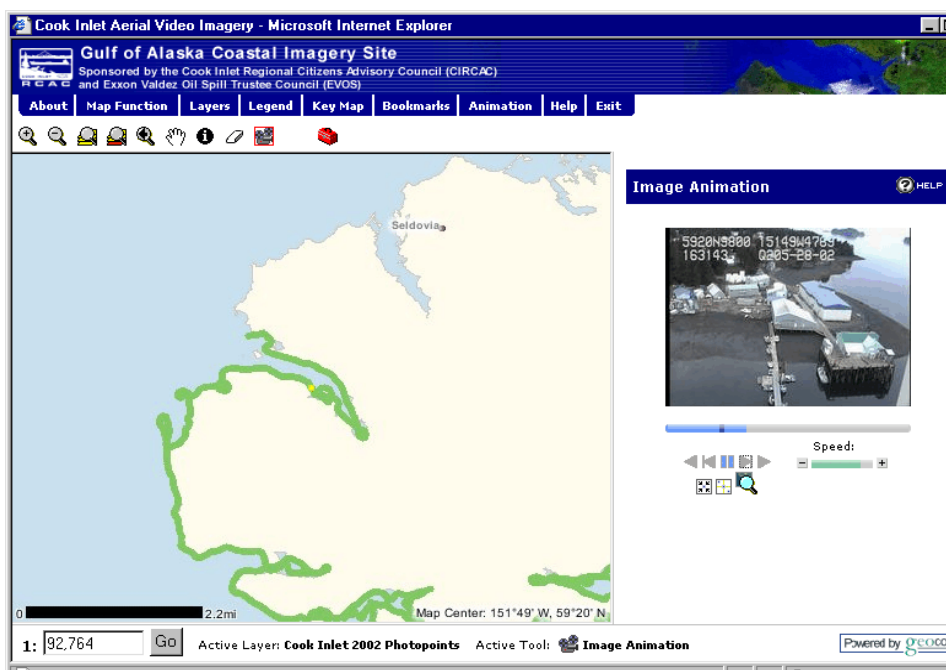


Figure 3 Example of the Gulf of Alaska Coastal Imagery site where users can select a portion of the coast of interest (left portion of screen, yellow dot) and then “fly” the section of coast using the video player (right portion of the screen) (<http://imf.geocortex.net/mapping/demos/cori/launch.html>).

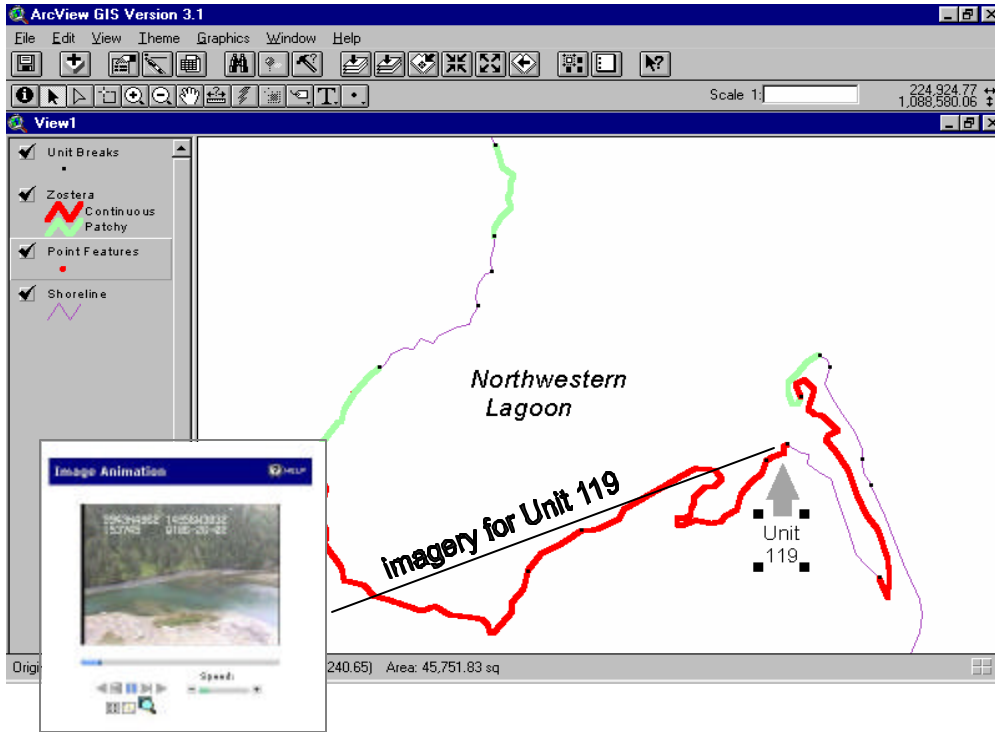


Figure 4. Example of linking imagery to specific mapping units to allow the user to “fly” the actual shoreline (in this case Unit 119) on which the resource (eelgrass) is mapped.

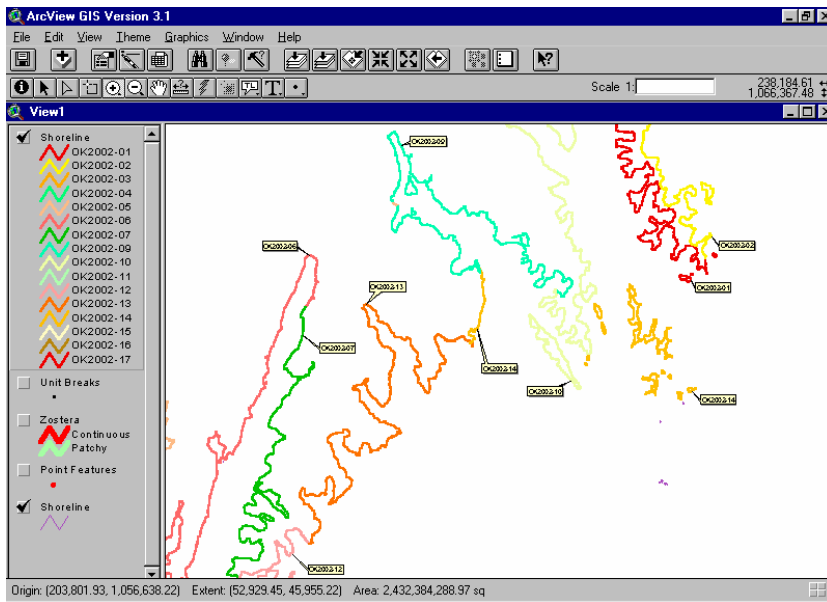


Figure 5 Videotape location and identifiers could be directly linked to an ordering site.

## Field Inventory System

Part of the Alaska ShoreZone Mapping Protocol specifies that field inventories are required to ensure accurate interpretation of the aerial videography and to provide more detailed information about species assemblages for various habitats and ecoregions. ShoreZone-driven inventories of rocky habitat were conducted in 2002 on the Outer Kenai. A procedure is presently under development (sponsored by CIRCAC with funding from the Kenai Peninsula Borough) to formalize the data recording (Fig. 6), establish a web-based photo voucher system for the inventory (Fig. 7), and provide detailed biological descriptions of invertebrate and algal assemblages (Fig. 8). This system is still under development but will be coordinated with this proposed web site development to ensure that it will be web-accessible and coordinated as part of this larger ShoreZone product to provide a direct linkage to ShoreZone Mapping data. The Alaska Coastal Habitat Web site would be designed to accommodate this component.

The screenshot shows a Microsoft Access form titled "station (physical)". The form is divided into several sections:

- Station Information:** Includes fields for station number (RP-02-23), location (south west corner of Nuka Island), site description (bedrock ramp in HIGH exposure), date (11-JUL-02), time of station (3:45), latitude/longitude coordinates, profile bearing, weather, current, and freshwater influence.
- Description of bands:** A text area containing detailed descriptions of different bands: VER (very wide but bedrock is black so it doesn't show on rock surface), BAR (upper beige barnacle, C. dal and B. glandula, two Polysipha, very narrow band above BMJ), BMJ (dense but patchy, M. bosmina with lots of filamentous reds and patches of S. costata, lower with B. glandula and C. dal, upper most really and BMJ/BAR nodules (certain M. californicus here)), and SLK (slender).
- band and zone detail:** A table with columns: station, band, distib, zone, compor, subst, and bedrock. It lists five bands: VER, BAR, BMJ, ALA, and D-B.
- Species:** A table with columns: species, name, abbrev, abundance, and record ID. It lists various species like ALAPMA, LESSLI, LAM SE, LIT ROT, PSACOC, DEPMIM, SERPVE, STYESP, and HENRLE.

Figure 6. Example of web-accessible, linked field station data, currently being collected as part of ShoreZone,



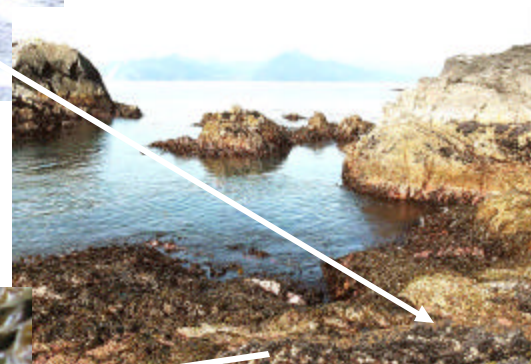
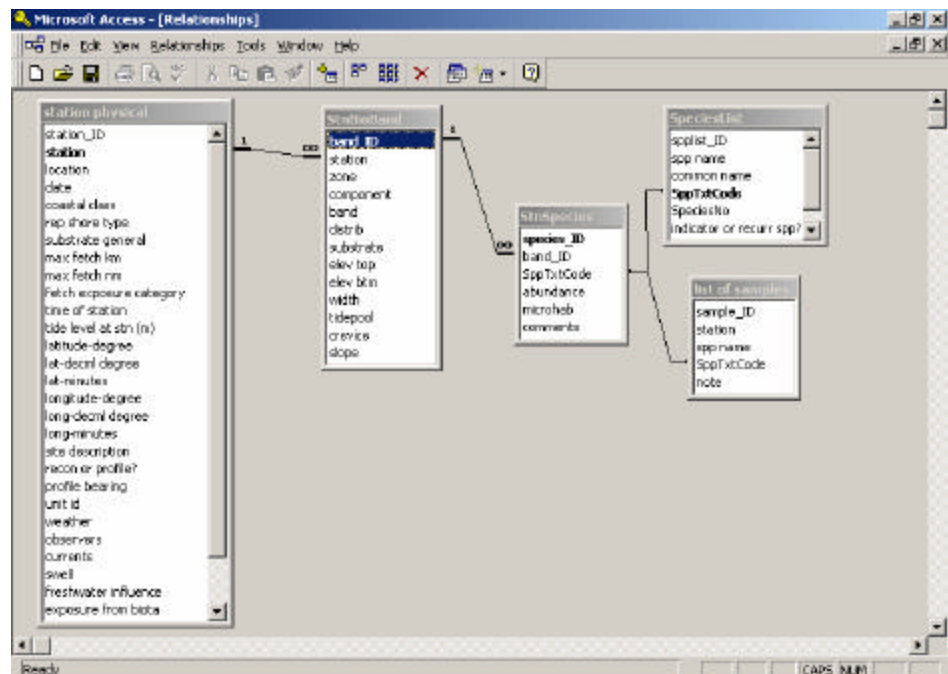


Figure 7. Aerial imagery is used for mapping Alongshore Units and Across-shore BioBands (left). Ground survey sites document specific BioBands (below) and species assemblages (lower, left) are inventoried and tagged to specific BioBands.

Figure 8. Example of relational database linking mapping data to specific species data at a site, to photos and to collections.



### ***C. Data Analysis and Statistical Methods***

The data incorporated into this web site will be produced based on the Alaska Shorezone Mapping protocols. Methods for summarizing intertidal data collected from the on-the-ground surveys are still being developed. This project will just compile mapping data collected during previous EVOS funded projects and those of the Cook Inlet RCAC. Not statistical analyses will be conducted other than using GIS software to summarize coastline mileage for various resources.

### ***D. Description of Study Area***

The project will use ShoreZone mapping data collected along the Kenai Peninsula coast including Kachemak Bay and the outer coast bounded roughly by 149 and 152 degrees W longitude and by 59.105 and 60.105 N latitude or, in other words, the contiguous coast from roughly Anchor Point to just east of Resurrection Bay.

### ***E. Coordination and Collaboration with Other Efforts***

The proposed project is a result-based effort designed to facilitate use of the ShoreZone datasets, which have been sponsored by a variety of agencies. To date, CIRCAC, EVOS, National Park Service, the Kenai Peninsula Borough, US Fish and Wildlife Service, the University of Alaska, and the Alaska Coastal Impact Assistance Program have all sponsored or funded components of ShoreZone. All these agencies have expressed an interest in making their data widely accessible. The data used for the prototype proposed here will be from the Kenai Peninsula coastline.

At a recent EVOS Trustee Council sponsored workshop titled “Biological and Physical Mapping of the Shoreline in the Exxon Valdez Oil Spill Area, Alaska.” At this workshop, recommendations were made by a group of over 30 participants from local, state, and federal agencies, as well as not-for-profit organizations, oil industry, and the GEM program’s Science and Technology Advisory Committee Chair to adopt the ShoreZone method as the standard for mapping biological and physical characteristics in the GEM area and for the ShoreZone Mapping Workgroup to advance this method in the GEM area and potentially statewide. This workgroup is composed of participants from the Cook Inlet RCAC (committee chair), the Nature Conservancy, ADEC, NPS, USF&WS, Kachemak Bay Research Reserve, the contractors who developed ShoreZone mapping techniques, and adjunct members from Washington State Department of Natural Resources and the British Columbia’s Ministry of Sustainable Resource Management. The ShoreZone Mapping Workgroup will work in an advisory capacity to help guide this project and to provide input by user-groups. Project coordination will be provided by Cook Inlet RCAC as an in-kind match.

In addition, participants of the workshop recommended a ShoreZone coordinator position be created as a position at The Nature Conservancy. The proposed Alaska Coastal Habitat Website will provide a tool that can be used by this ShoreZone coordinator to gather support for expanding ShoreZone mapping to other contiguous coastlines in Alaska.

### **III. SCHEDULE**

#### **A. Project Milestones**

**Table 2 Proposed Tasks and Implementation Schedule**

<b>Task</b>	<b>Activity</b>	<b>Description</b>	<b>Date Start</b>	<b>Date End</b>
1	Establish Website	setup an appropriate URL	1 Oct 03	15 Nov 03
2	Posting Thematic Data	Outer Kenai Data set-up on an ArcIMS server; additional shoreline sections posted as completed	1 Nov 03	15 Jan 04
3	Downloadable Products	Outer Kenai ShoreZone mapping data (Arc shape files; meta data and Data manual) posted in download portion of the web site; additional shoreline sections posted as completed.	1 Oct 03	30 Jan 04
4	Coastal Imagery Site	establish transparent link to existing Gulf of Alaska Coastal Imagery Viewer	1 Oct 03	30 Oct 03
5	Link Imagery to Mapping data	create a database that links images, presently on the imagery web site [Task 4] to mapping units [Task 2] and provide video clips of areas of high interest	1 Dec 03	30 Jan 04
6	Videotape Identification and Ordering Link	setup a map that allows users to easily identify and order videotapes of interest	15 Nov 03	30 Jan 04
7	Field Data Display	Develop a framework for the future inclusion of a web-based species data, survey data and voucher photos	15 Nov 03	15 Feb 04

Dates Based on a Contract Start of 01 Oct 2003

#### **B. Measurable Project Tasks**

Specify, by each quarter of each fiscal year, when critical project tasks (for example, sample collection, data analysis, manuscript submittal, etc.) will be completed. This information will be the basis for the quarterly project progress reports which are submitted to the Trustee Council Office. Please format your schedule like the following example.

FY 04, 1st quarter (October 1, 2003-December 31, 2003)

October: Project funding approved by Trustee Council; all project tasks begin

FY 04, 2nd quarter (January 1, 2004-March 31, 2004)

January 12-16 (tentative): Present at annual EVOS Meeting

February 15: Deliver Final Web-based Products

FY 04, 3<sup>rd</sup> quarter (1 April – June 31, 2004)

April-May: Presentations for user groups, local communities, and resource agencies.

### **IV. RESPONSIVENESS TO KEY TRUSTEE COUNCIL STRATEGIES**

### ***A. Community Involvement and Traditional Ecological Knowledge (TEK)***

The Cook Inlet RCAC will be the project lead for this proposed Web site project and through in-kind services of their Public Outreach and Research staff will provide outreach to local communities and other user groups. This will be conducted through community visits and offers to train and present the web-based data for various user groups and resource agencies at their request. The Board of Directors of the Cook Inlet RCAC includes representatives from various communities within the GEM area as well as specific interest or user groups including: the cities of Seldovia, Homer, Kenai, Kodiak, and Anchorage; the Kodiak Island and Kenai Peninsula Boroughs, and; Native, Aquaculture, Environmental, Commercial Fishing, and State Chamber of Commerce interest groups. These organizations have unanimously supported the ShoreZone projects of the Cook Inlet RCAC and will provide a link for this information and educational offer back to their communities and group members. In addition, public members on Cook Inlet RCAC committees also include members from communities on the southern Kenai Peninsula, *e.g.* Nanwalek.

### ***B. Resource Management Applications***

As explained above, there has been significant support from local, state, and federal resource agencies as well as other organizations that have use for coastal data. Participants at a recent workshop on nearshore mapping where ShoreZone techniques were recommended for adoption as GEM nearshore mapping standard included representatives from National Park Service, U.S. Fish and Wildlife Service, National Marine Fisheries Service, Kachemak Bay Research Reserve (ADF&G), the Alaska Department of Environmental Conservation, Alaska Department of Natural Resources, U.S. Geological Survey, the Nature Conservancy, the Cook Inlet and Prince William Sound RCACs. Center for Alaskan Coastal Studies, the Exxon Valdez Oil Spill Trustee Council, and others.

The above group identified Shoreline habitat mapping as desirable by many user groups including land and resource managers, recreational and community planners, oil spill responders, researchers, and citizen groups. The most common attributes requested from habitat mapping are the type of substrate (sand, gravel, mud, rock, wetlands, for example), major biological assemblages (such as wetlands, eelgrass, kelp, or other algae), and evidence of human impact or development. The following specific uses were identified by the group during the workshop:

- Monitoring – determine locations to sample trends over time
- Environmental assessments and determining potential environmental impacts
- Oil spill response, resource prioritization and planning
- Planning by industries – oil, fishing, tourism, forestry
- Resource management, such as identifying Essential Fish Habitat
- Recreational Use and Conservation planning
- Habitat management
- Subsistence species locations
- Coastal community managing and planning
- Private landowner – development and permitting
- Public education

Finally, several resource agency personnel have agreed to participate as members of the ShoreZone Mapping Advisory Workgroup, members of which are listed below.

*Sue Saupe (Chair, Cook Inlet RCAC), Amalie Couvillion (TNC), Joel Cusick (NPS), Dale Gardner(ADEC), John Harper (ShoreZone contractor), Mary Morris (ShoreZone contractor), Carl Schoch (KBNERR), Lewis Sharman (NPS), Dana Seagars (FWS), Gail Colby (Alyeska), Rod Hoffman (Alyeska), and adjunct members Hally Hofmeyr (BC) and Helen Berry (WA)*

## **V. PUBLICATIONS AND REPORTS**

Any future publications that result from this funding will fulfill the EVOS Trustee Council's adopted policy regarding an acknowledgment and disclaimer to be used in publishing results of projects it has supported. A final report will be submitted upon project completion that will summarize the web-site products and instructions for use.

## **VI. PROFESSIONAL CONFERENCES**

Professional conferences attended as part of this project will be funded through matching funds by the Cook Inlet RCAC.

## **VII. REFERENCES**

- Berry, H.D., J. R. Harper, T. F. Mumford, Jr., B.E. Bookheim, A.T.Sewell, and L.J. Tamayo. 2001. The Washington State ShoreZone Inventory User's Manual. Washington State Department of Natural Resources, Olympia, WA.
- Bookheim, B, H. Berry and J.R. Harper 2001. An Inventory of Washington State's Marine Shorelines using the ShoreZone Mapping System. Proceedings of the 2001 Puget Sound Research Conference, Seattle, Washington. (poster).
- Harper, J.R. and H. Berry 2001. Examples of Application of ShoreZone Mapping Data from the State of Washington. Proceedings of the 2001 Puget Sound Research Conference, Seattle, Washington.(poster).
- Howes, D. E., 2001. BC Biophysical shore-zone mapping system – a systematic approach to characterize coastal habitats in the Pacific Northwest. Proceedings of the 2001 Puget Sound Research Conference, Seattle, Washington: 11p.
- Howes, D.E., J.R. Harper and E.H. Owens 1994. Physical shore-zone mapping system for British Columbia. Technical Report by Coastal & Ocean Resources Inc, Sidney, BC for the Coastal Task Force of the Resource Inventory Committee (RIC), RIC Secretariat. Victoria, B.C. 71p.
- Searing, G.F. and H.R. Frith 1995. British Columbia shore-zone mapping system. Contract Report by LGL Ltd., Sidney, BC for Land-Use Coordination Office, BC Ministry of Environment, Victoria, BC. 46p.

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**JOHN R. HARPER**

P. Geo.

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## **SPECIALTIES:**

- *coastal and nearshore processes*
- *multidisciplinary marine studies*
- *coastal zone management*
- *oilspill research and planning*

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## **EDUCATION:**

- B.Sc. Geology (cum laude), University of Massachusetts (1973);  
L.R. Wilson Award for Excellence in Geology
- M.Sc. Marine Science, Louisiana State University (1976)
- Ph.D. Marine Science, Louisiana State University (1978)

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## **WORK EXPERIENCE:**

- 1987-present **Principal**, Coastal and Ocean Resources (previously Harper Environmental Services), British Columbia and Nova Scotia
- 1989-present **Adjunct Professor**, Centre of Earth and Ocean Resources, University of Victoria, Victoria, British Columbia
- 1987-1989 **Marine Geologist/Coastal Coordinator**, Committee for Co-ordination of Joint Prospecting for Mineral Resources in South Pacific Offshore Areas (CCOP/SOPAC), Suva, Fiji
- 1986-1987 **Manager**, Maritime Region, Dobrocky Seatech Ltd., Halifax, Nova Scotia
- 1985-1986 **Manager**, West Coast Region, Dobrocky Seatech Ltd., Sidney, BC
- 1983-1985 **Manager**, Geosciences and Hydrographic Services, Dobrocky Seatech Ltd.
- 1980-1983 **Senior Project Scientist**, Woodward-Clyde Consultants, Victoria, British Columbia and San Francisco, California
- 1978-1980 **Post-Doctoral Fellow**, Geological Survey of Canada, Pacific Geoscience Centre., Sidney, British Columbia
- 1973-1978 **Research Assistant**, Coastal Studies Institute, Louisiana State University, Baton Rouge, Louisiana

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## **GEOGRAPHIC EXPERIENCE:**

East, west and arctic coasts of Canada; east, west and arctic coasts of the United States; Brazil; Costa Rica; Fiji; Kenya; Kiribati; Papua New Guinea; Tonga; Western Samoa.

Over the past 15 years, Dr. Harper has personally managed over 250 separate projects related to coastal and marine resources including the following disciplines:

***Coastal Zone Management*** - Dr. Harper has been closely involved with coastal management planning in British Columbia and is currently conducting a resource inventory and user needs assessment for the province of British Columbia. He is also involved with the development of marine region classification of Canada for use in environmental ecosystem monitoring. Dr. Harper has been closely involved with the development of coastal habitat classification and mapping systems over the past three years, using state-of-the-art remote sensing and GIS systems.

***Oil Spill Research, Planning and Response*** - oil spill research studies since 1980, including several years of field studies associated with the Baffin Island Oil Spill experiment, sensitivity evaluations for the coasts of northern California, British Columbia, Kodiak Island, the Chukchi and Beaufort Sea coasts of Alaska, the Beaufort Sea coast of Canada, Labrador and Newfoundland. Other research areas have included the long-term fate of oil on shorelines, decision-making for shoreline cleanup operations and long-term monitoring programs. In 1984, he designed and implemented a physical monitoring program of the MV Puerto Rican oil spill off San Francisco. In 1991, Harper Environmental Services compiled the first Directory of Canadian Marine Oilspill Specialists. In 1992, he directed an Oil Spill Sensitivity Mapping Workshop in Costa Rica for ARPEL. Dr. Harper has been extensively involved in the EXXON Valdez oil spill cleanup operation in Prince William Sound (1989-1992) with participation in quality assurance for preparation of oiling maps, coordination of the Prince William Sound Fate and Persistence Studies, bioremediation monitoring surveys.

***Coastal Research/Marine Geology*** - coastal and nearshore studies since 1971 and with research projects on all major coastlines of North America and throughout the South Pacific. Research topics have included: beach monitoring, coastal mapping, sediment transport predictions and measurements, coastal erosion and scour monitoring, and coastal storm surge surveys.

***Environmental Impact*** - since 1973, Dr. Harper has been closely involved with large, multidisciplinary impact assessments including: the first superport to be developed in the US (Harper, 1974), major construction projects at Prudhoe Bay (causeway construction and oil field waterflood construction), siting and impact evaluation of a major marine oil terminal in Santa Barbara, and the Beaufort Sea Environmental Monitoring Project (BEMP). Also he has been extensively involved with oil spill contingency planning in the marine environment with input to plans for offshore drilling in western Canada (Chevron, PetroCanada), the Beaufort Sea (Dome Petroleum) and Prudhoe Bay, Alaska (ARCO).

Coastal and Ocean Resources Inc. (CORI). 2002. 2002 Aerial Video Imaging Survey, Outer Kenai, Alaska (24-28 June 2002). Contract Report by Coastal and Ocean Resources Inc. of Sidney, British Columbia to the Exxon Valdez Oil Spill Trustee Council, Anchorage, Alaska.

Coastal and Ocean Resources Inc., (CORI). 2002. 2002 Field Verification Survey of Shorelines in Cook Inlet and the Outer Kenai Peninsula. Contract Report by Coastal and Ocean Resources Inc. of Sidney, British Columbia to the Cook Inlet Regional Citizens Advisory Council, Kenai, Alaska.

Harper, J.R. and P.D. Reimer 1995. Review of aerial video survey techniques and recommendations of survey standards. Technical Report by Coastal and Ocean Resources Inc., Sidney, BC for the Ministry of Agriculture, Fisheries and Food, Victoria, BC, 32 p. w appendices

Harper, J.R., D.F. Dickins, D. Howes and G. Sergy, 1992. Recent shoreline mapping projects in British Columbia and significance to oil spill countermeasure planning. Proceedings of the 15th Arctic and Marine Oil Spill Technical Seminar (AMOP), Environment Canada, p. 293-300.

**Susan M. Saupe**

910 Highland Ave., Kenai, AK 99611

home: (907) 776-5824

**Education:**

**M.S. Chemical Oceanography**, Univ. of Alaska, Fairbanks, May 1990  
**B.S. Chemistry**, Univ. of Alaska, Fairbanks, May 1985  
 University of Oregon, Eugene, 9/80-6/81.

**Professional Experience:**

2001-present **Lead Scientist**, Alaska Environmental Monitoring and Assessment Program (EMAP), ADEC, Anchorage, AK  
 1996-present **Director of Science and Research**, Cook Inlet Regional Citizens Advisory Council, Kenai, AK  
 1990-1996 **Crew Leader/Data Analysis Supervisor**, Institute of Marine Science, Univ. of Alaska, Fairbanks, AK  
 1988-1991 **Research Assistant**, The Ecosystems Center, Marine Biological Laboratory, Woods Hole, MA  
 1985-1988 **Graduate Research Assistant**, School of Fisheries and Ocean Science, Univ. of Alaska, Fairbanks, AK  
 1984-1985 **Laboratory Technician**, Inst. of Northern Engineering/Water Research Center, Univ. of Alaska, Fairbanks, AK  
 1982-1984 **Teaching Assistant**, Chemistry Dept., Univ. of Alaska, Fairbanks, AK

**Field Experience:**

6/02-8/02 **Chief Scientist**, Alaska EMAP, Gulf of Alaska  
 5/02; 6/01 **Shoreline Ecologist/Project Manager**, ShoreZone Mapping Project, Cook Inlet and Kenai Peninsula Coastline  
 9/00 **Project Manager**, Intertidal Reconnaissance Surveys, central Cook Inlet, AK  
 6/99 **Invited Scientist**, Collaborated with NOAA Hazmat Scientists for Intertidal Studies, Kasitsna Bay, Alaska.  
 6/99 **Project Manager**, Acoustic Doppler Current Profile Study conducted by University of Alaska Fairbanks, Cook Inlet, Alaska.  
 6/98 **Invited Scientist**, Collaborated with NOAA Hazmat Scientists for Intertidal Studies, Prince William Sound, Alaska.  
 3/94-9/96 **Chief Scientist**, Intertidal Studies, Kachemak Bay, Alaska (4 months).  
 6/96-7/96 **Scientific Diver**, Nearshore Vertebrate Predators. R/V *Bering Explorer*  
 6/90-9/95 **Chief Scientist**, Intertidal Damage Assessment and Restoration Studies, Prince William Sound and Ke Peninsula, R/Vs *Bering Explorer*, *Pacific Star*, *Sea Haven*, and *Acania* (17 mos.).  
 3/92-4/92 **Contractor** to University of Texas, Under-Ice Photosynthesis Studies in Boulder Patch, Endicott Island, Alaska.  
 8/88-3/91 **Research Assistant**, Estuarine Modeling Study, Cape Ann and Cape Cod, MA (2 mos.).  
 8/88 **Contractor** to Kinnetic Laboratories, Pulp mill effluent effects on primary production. R/V *Curlaw*.  
 4/88-5/88 **Graduate Student**, Bering Sea marginal ice zone study. R/V *Alpha Helix*.  
 9/87 **Graduate Student**, Stable isotope food web study, Chukchi Sea. R/V *Surveyor*.  
 8/87 **Graduate Student**, Nitrate uptake experiments, Northern Bering and Chukchi Seas. R/V *T.G. Thomson*  
 2/87-3/87 **Contractor** to LGL Alaska, Water and zooplankton collections, Aleutian Islands. R/V *Miller Freeman*  
 10/86 **Graduate Student**, Zooplankton collections, Beaufort Sea. USCGC *Polar Star*.  
 9/86 **Graduate Student**, Stable isotope Study, Chukchi Sea. R/V *Oceanographer*.  
 9/84-8/85 **Graduate Student**, Carbon Energetics Study, Southeastern Bering Sea (4 mos.) R/V *Miller Freeman*.

**Project Management:**

2001-present **Alaska Environmental and Monitoring Program**, Alaska Dept. of Environmental Conservation  
 2001-present **ShoreZone Mapping**, Contracts with Coastal and Ocean Resources  
 2000-2002 **Intertidal Reconnaissance Surveys**, Contract with Littoral Ecological and Ecosystem Services, Inc.



2000	<i>Tide-Rip Study in Cook Inlet</i> , Contract with Dr. Mark Johnson, University of Alaska Fairbanks
1996-1998	<i>P450 Reporter Gene System Assays</i> , Contract with Jack Anderson, Columbia Analytical Inc.
1996-1997	<i>Cook Inlet Shelikof Strait Project</i> , Contract with Kinnetic Laboratories Incorporated
1997-1998	<i>Kenai River Estuary Sediment Characterization Study</i> , Contract with Kinnetic Laboratories, Inc.
1997-1998	<i>Cook Inlet Sediment Toxicity Study</i> , Contract with Kinnetic Laboratories, Inc.
1994-1998	<i>Kachemak Bay Intertidal Recruitment and Succession Study</i> , Contract through CMI

***Additional Experience and Education:***

- Shoreline Countermeasures Assessment Team Training, April 1999
- Adjunct Faculty, Kenai Peninsula Community College, Jan 98-May 2000
- Commercial Longline and Set-net Salmon Fisherman in Kodiak, 1984, 1992
- NAUI Openwater II SCUBA Certification (Dry-Suit Trained)
- Chart Navigation, Massachusetts Maritime Academy
- Outboard Engine Repair Classes (Mass. Maritime and Fairbanks Community Schools)
- Welding Technology (SMAW, Tanana Valley Community College)

***Misc. Steering and Planning Committees***

- Alaska Non-Indigenous Species Working Group, Representative for CIRCAC
- Oil Spill Recovery Institute, At-large member of Advisory Board
- Habitat Committee, EVOS Trustee GEM Program
- Alaska Water Quality Program Rebuild Working Group, Alaska Department of Environmental Conservation
- ARRT, Science and Technology Work Group, Representative for CIRCAC
- Kachemak Bay National Estuarine Research Reserve, Research Committee
- Environmental Monitoring Committee and Prevention, Response, Operations, and Safety Committee, Cook Inlet RCAC

***Misc. Publications/Presentations related to Proposal***

- Harper, J.R. and S. M. Saupe. 2002. Intertidal Biophysical Mapping of Kachemak Bay and Cook Inlet Using Low-Tide Oblique Aerial Video Imaging. Proceedings Kachemak Bay Conference, Homer, AK.
- Saupe, S.M. 2002. Shoreline Inventory Mapping System. EVOS Trustee Council Workshop Detecting and Understanding Change in Nearshore Environments: Planning for Habitat Mapping in the Gulf of Alaska, Homer, AK.
- Saupe, S.M. 2003. Mapping Coastal Habitats in Southcentral Alaska using the ShoreZone Technique. Quarterly newsletter of Alaska Chapter of the American Fisheries Society, Vol. 23 No.2., Juneau, AK.
- Harper, J., H. Berry, and S. Saupe. 2003. A Summary of the ShoreZone Mapping System. Proceedings of the Northeastern Pacific Marine Habitat Classification Workshop, 27 May 2003, CA.

**EXXON VALDEZ OILSPILL TRUSTEE COUNCIL  
DETAILED BUDGET FORM FY 04 - FY 06**

<b>Budget Category:</b>	Proposed FY 04	Proposed FY 05	Proposed FY 06	TOTAL PROPOSED
Personnel	\$0.0	\$0.0	\$0.0	\$0.0
Travel	\$0.0	\$0.0	\$0.0	\$0.0
Contractual	\$17.6	\$0.0	\$0.0	\$17.6
Commodities	\$0.0	\$0.0	\$0.0	\$0.0
Equipment	\$0.0	\$0.0	\$0.0	\$0.0
Subtotal	\$17.6	\$0.0	\$0.0	\$17.6
Indirect (rate will vary by proposer)	\$1.8			
Project Total	\$19.4	\$0.0	\$0.0	\$17.6
Trustee Agency GA (9% of Project Total)	\$1.7	\$0.0	\$0.0	\$1.6
Total Cost	\$21.1	\$0.0	\$0.0	\$19.2

**Cost-share Funds:**

Cook Inlet RCAC will provide in-kind match for project management salary (5K) and travel. Funds to the Cook Inlet RCAC from the Kenai Peninsula Borough have of over 140K have been dedicated for the collection of the data that will be presented in this proposal's products. The Kenai Peninsula Borough has funded Cook Inlet RCAC 15K directly for development of the database dictionary which is a portion of this proposal. Travel for contractors to attend the annual EVOS Trustee Council meeting in 2004 will be provided by Cook Inlet RCAC.

**FY 04-  
06**

Date Prepared:

Project Number:  
Project Title:  
Proposer:

**FORM 4A  
NON-  
TRUSTEE  
SUMMARY**



**EXXON VALDEZ OILSPILL TRUSTEE COUNCIL  
DETAILED BUDGET FORM FY 04 - FY 06**

<b>Contractual Costs:</b>		Contract
Description		Sum
Coastal and Ocean Resources, Inc. (Dr. John Harper)_and subcontractors (Mary Morris of Archipelego Marine Resources)		
Set-up web site		1.7
Post Thematic Data (including labor and ArcIMS Site hosting costs for one year)		5.1
Set-up downloads		1.3
Costal Imagery Site		0.4
Link Imagery to Map Data		3.7
Video tape ordering		2.4
Posting coastal field data		3.0
If a component of the project will be performed under contract, the 4A and 4B forms are required.		
<b>Contractual Total</b>		\$17.6
<b>Commodities Costs:</b>		Commodity
Description		Sum
<b>Commodities Total</b>		\$0.0

**FY 04**

Project Number:  
Project Title:  
Name:

**FORM 4B  
Contractual &  
Commodities  
DETAIL**





**EXXON VALDEZ OILSPILL TRUSTEE COUNCIL  
 DETAILED BUDGET FORM FY 04 - FY 06**

<b>Contractual Costs:</b>		Contract
Description		Sum
If a component of the project will be performed under contract, the 4A and 4B forms are required.		<b>Contractual Total</b>
		\$0.0
<b>Commodities Costs:</b>		Commodity
Description		Sum
		<b>Commodities Total</b>
		\$0.0

**FY 05**

Project Number:  
 Project Title:  
 Proposer:

FORM 4B  
 Contractual &  
 Commodities  
 DETAIL







**EXXON VALDEZ OILSPILL TRUSTEE COUNCIL  
 DETAILED BUDGET FORM FY 04 - FY 06**

<b>Contractual Costs:</b>	Contract
Description	Sum
<b>Contractual Total</b>	\$0.0
<b>Commodities Costs:</b>	Commodity
Description	Sum
<b>Commodities Total</b>	\$0.0

**FY 06**

Project Number:  
 Project Title:  
 Proposer:

FORM 4B  
 Contractual &  
 Commodities  
 DETAIL

