EVOS PROPOSAL SUMMARY PAGE

(Trustee Council Use Only)
Project No. ____G-030641_____
Cluster _____
Date Received ____11/12/02 (revised)_

Project Title: Development of an Alaska ShoreZone Mapping Protocol for GEM (Project 030641)

Project Period: A one year project funding period is requested, starting FY03

Proposer: Dr. John Harper
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EVOS Funding: $ $34,400 in FY03

Matching Funds: approx. $ 20k (CIRCAC and Kenai Borough) to cover pilot mapping

Study Location: prototype will be developed for Outer Kenai Peninsula or Cook Inlet

Trustee Agency: The proposed lead Trustee Agency would be ADFG through the Kachemak Bay National Estuary Research Reserve

Abstract:
This project is envisaged as a longer-term project for mapping the Gulf of Alaska shoreline at scales of approximately 1:5,000 to provide a spatial framework for long-term GEM monitoring. The first phase (this proposal) of the GEM shoreline mapping initiative would be to develop an Alaska ShoreZone Mapping Protocol, based on the BC-Washington protocol but incorporating special components for Alaska; a user workshop is included as part of the protocol development.

The development Alaska ShoreZone Mapping Protocol will involve four steps:

1. development of a DRAFT Protocol for Alaska based on the BC-Washington system but incorporating additions to accommodate unique characteristics of Alaska.
2. application of the DRAFT Protocol to ~1,000 km of shoreline (Outer Kenai Peninsula is proposed).
3. presentation of the DRAFT Protocol and prototype results from Outer Kenai at an Anchorage Users Workshop.
4. synthesis of agency and institutional comments on the DRAFT Protocol during and after the workshop and recommendations for additional implementation.

The ShoreZone Mapping Protocol will provide GEM researchers with a consistent, regional characterization of the physical and biological shore-zone features throughout the GEM project area. This mapping data is widely used by state and federal agencies for regional planning (e.g., GRS planning, eelgrass distribution maps), and development of derivative models (e.g., potential oil residence, sandlance spawning capability). Non-governmental organizations (NGO's) have routinely used the ShoreZone data for public awareness campaigns and marine Protected Area (MPA) planning.

I. INTRODUCTION

The GEM ShoreZone Mapping project was implemented in 2002 on very short notice (projects were funded following the GEM Nearshore Meeting in Homer in April 2002) to provide a systematic biophysical inventory of the GEM project area. The ShoreZone mapping approach is based on the same protocol used throughout Washington and British Columbia (WaDNR 2000; Harper and Berry 2001; Howes 2001) but has yet to be formalized into an Alaska ShoreZone Mapping Protocol.

Aerial video imagery is collected during the lowest tides of the year and this imagery provides the primary data for the mapping. Approximately 3,000 km of shoreline was imaged in 2002 with the EVOS-funding and an additional 2,200 km has been conducted with CIRCAC funding. The Kenai Borough has provided funding that will allow most of the imagery acquired to date to be mapped to the ShoreZone standard.

The ShoreZone Mapping Protocol will provide a standard for systematic regional mapping data that can be used for GEM planning and in particular for selection of more detailed sampling stations. At the present time, the ShoreZone data is being used by ADFG for their high resolution SCALE mapping in Kachemak Bay.

II. NEED FOR THE PROJECT

A. Statement of Problem

The ShoreZone Mapping proposal will provide a systematic high resolution, low-tide imagery throughout the GEM project area as well as a segment-by-segment data inventory of key physical and biological shore zone features. The existing Environmental Sensitivity Index (ESI; NOAA 2000; see also Ruby *et al* 1979, and Issacs Associates 1985) maps occur within the region but are not of sufficient resolution for ecosystem monitoring. The ESI maps are only partially available in a digital format throughout the GEM region; they do not include explicit exposure, substrate, morphology or biotic data, as does the ShoreZone Mapping data. Additionally, ShoreZone data include a detailed across-shore characterization of morphology, substrate type and biota. The ShoreZone mapping system also provides the benefit of the public availability of the digital video imagery in conventional formats (VHS tapes or DVD) or web-based images (http://imf.geocortex.net/mapping/demos/cori/launch.html).

The ShoreZone Mapping Protocol has not been formally developed or presented to participating resource agencies. This proposal would fund (a) the development of a protocol and (b) the presentation to a User Workshop for comment and discussion.

B. Rationale/Link to Restoration

“In establishing the GEM Program, the Trustee Council explicitly recognized that complete recovery from the oil spill may not occur for decades and that full restoration of injured resources will most likely be achieved through long-term observation and, as needed, restoration actions. The Council further recognized that conservation and improved management of injured resources and services will require substantial ongoing investment to improve understanding of the marine and coastal ecosystems that support the resources, as well as the people, of the spill region. In addition, prudent use of the natural resources of the spill area without compromising

their health and recovery requires increased knowledge of critical ecological information about the northern Gulf of Alaska. This knowledge can only be provided through a long-term monitoring and research program that will span decades, if not centuries."

The completed ShoreZone Mapping Protocol will provide a systematic methodology for collection of high-resolution data on physical and biological resources throughout the GEM project region. It is expected that the ShoreZone dataset, which will include about 4,000km of shoreline by summer of 2003, will contribute substantially by providing a spatial framework for more detailed monitoring studies, by augmenting trustee agencies resource management information and by raising public awareness to coastal resources.

C. Link to GEM Program Document

> ***GEM Mission Statement***
> Sustain a healthy and biologically diverse marine ecosystem in the northern Gulf of Alaska (GOA) and the human use of the marine resources in that ecosystem through greater understanding of how productivity is influenced by natural changes and human activities.

The proposed ShoreZone Mapping Protocol Development is seen as an initial step in a long-term mapping project that addresses the GEM Mission (inset, right) in a number of specific ways. The ShoreZone project is particularly relevant to three of the GEM goals:

1. *Understanding* - by providing a near synoptic, high-resolution picture of coastal resource distribution throughout the Gulf, spatial variation in biological resources will be related to important physical constraints (substrate, exposure, water quality) as well as man-made impacts (harvesting, seawall construction). For example, during the 2002 surveys, spatial variation in the distribution of chitons (visible during the survey!) could be related to subsistence harvesting near villages (e.g., Port Graham). The Protocol will provide for a standardized methodology that can be used by a variety of resource agencies.

2. *Informing* - the data products associated with the ShoreZone proposal provide immediate public access to imagery, often the only low-tide imagery available, and short-term access to synthesized mapping data in GIS format. Previous experience in the state of Washington and the Province of British Columbia indicates that the ShoreZone data will be utilized by a wide range of resource agencies for shore-spawning fish habitat assessment (Washington Department of Fish and Wildlife), for bird habitat capability (Washington Department of Fish and Wildlife), for oil spill sensitivity assessments (Burrard Clean Operations Inc., BC Ministry of Environment and Washington Department of Ecology, NOAA), for marine park siting (Orcas Pass Marine Protected Area Initiative), and planning (Olympic Marine Sanctuary, Pacific Rim National Park, Gwaii Hanaas National Marine Park). Non-governmental organizations have been significant users of the information (see Fig 3) and the dataset is routinely used by universities in research projects (Dr. T. Klinger, U of W, pers. communication 2002).

3. *Solve* - the proposed ShoreZone project includes highly innovative components for making imagery and ultimately mapping data web-accessible. With support of the Cook Inlet Regional Citizens Advisory Council (CIRCAC), approximately 2,000 km of shoreline imagery was recently posted on an ArcIMS web site, allowing web-users to "fly" the Cook Inlet shoreline during the lowest tides of the year. The Washington ShoreZone mapping project (Washington Department of Natural Resources) produced hundreds of CD-ROMs of the ShoreZone data that

were freely distributed. CORI has consistently examined means of making the ShoreZone dataset widely accessible.

The ShoreZone project will complement the GEM project in the following ways:

Innovative Information Transfer: The existing and proposed ShoreZone mapping project incorporates a highly innovative procedure for displaying all shoreline imagery collected on a publicly-accessible web site. One-second video captures are incorporated onto an ArcIMS web site to allow any web user to literally "fly" the shoreline (http://imf.geocortex.net/mapping/demos/cori/launch.html). This may represent the first use of the ArcIMS mapping technology as part of the GEM project. It is anticipated that the entire mapping dataset will be web-accessible through an ArcIMS, allowing users to generate distribution maps without the need of a GIS.

Modeling Applications: The ShoreZone Protocol will allow for a uniform biophysical dataset throughout the 23,000 km of shoreline in the GEM project area. The data provide a rationale for extrapolating site-monitoring data beyond the actual monitoring site.

Cross-Habitat Linkages: The proposed ShoreZone Protocol and dataset includes mapping of resources in ***estuaries*** and as such provides direct linkage between *nearshore* resources and *watershed* resources. In addition, the ShoreZone data set will provide site-specific information on intertidal epibenthos, which is partly related to water quality characteristics of the *Alaskan Coastal Current*. It is expected that large-scale spatial variations in this epibenthos will be strongly related to variation within the *Alaska Coastal Current* ecosystem.

III. PROJECT DESIGN

A. Objectives

Specific objectives of this *revised* ShoreZone proposal are:

1. develop a DRAFT Alaska ShoreZone Mapping Protocol that is based on the BC - Washington Mapping Protocol but reflects unique attributes of the Alaskan coastal environment that are not accommodated by the present protocol.

2. develop pilot mapping products (the actual *mapping* to be funded by CIRCAC and EVOS FY02 funds) using the DRAFT Protocol.

3. conduct a ShoreZone Users Workshop to present the result of the prototype mapping, and accommodate institutional and agency comments.

4. synthesize agency and user comments and gauge agency institutional interest in the Protocol and system.

B. Procedural Methods

It is recommended that an external *Advisory Committee* of three individuals be formed to guide this project. The committee members would be formalized with the agency administrator and GEM/EVOS and would be expected to include interested agencies and institutions such as

CIRCAC, NOAA or NPS). The Advisory Committee would review interim products prior to public circulation.

B.1 Development of a DRAFT Alaska ShoreZone Mapping Protocol

The basis of the mapping conducted in Alaska to date has been the BC-Washington ShoreZone Mapping Protocol (WaDNR 200; Howes 2001); this system has been applied to over 35,000 km of shoreline, much of it similar to the Alaska coastline. Preliminary mapping within Cook Inlet has identified some problematic areas with the system, however. In particular, we have found that the BC-Washington system does not address very wide shorelines with the precision that users expect - the basic assumption of the shoreline as a linear mapping feature is inappropriate. We have been aware of this limitation in other areas but have ignored it due to the small percentage of coastline involved. Within the GEM area, there are large sections of shore that do not meet this assumption (e.g., Kamishak Bay, Copper River delta).

We are proposing that the BC-Washington protocol be revised to address this problem. The proposed revision would incorporate a formal procedure for mapping wide shorelines. We anticipate that "wide" shorelines will be mapped using a polygon-based mapping system rather than a linear/segment mapping system

The Alaska ShoreZone Mapping Protocol will result in data products that are consistent with EVOS data standards and will be registered with the Alaska State Geospatial Data Clearinghouse.

The actual products for this task are summarized below and both products would be reviewed by the Advisory Committee prior to web-posting:

- a DRAFT User's Manual outlining the Protocol. The Users Manual will include schematics of the system (e.g., Fig. 1 & 2) and an overview of assumptions used in the mapping. The DRAFT User's Manual will be in a PDF format and be web-posted prior to the Workshop.

- a DRAFT Technical Manual & Data Dictionary that outlines detailed procedures to be used and includes the database design (e.g., Tables 1 & 2). The DRAFT Technical Manual will be in a PDF format and web-posted prior to the Workshop.

B.2 Pilot Mapping Using the DRAFT Protocol

The DRAFT Protocol, would be applied to 1,000 km of shoreline of the Outer Kenai Coast or Cook Inlet to provide an adequate testing of the technique in a wide range of coastal environments (mapping costs are from EVOSFY02 funds and from CIRCAC funds). The application of a polygon mapping system is non-trivial and may involve the use of alternative remote sensing imagery because the low-water line, used to define the seaward limit of the intertidal zone, is not well defined for most of the GEM project region.

The resulting pilot mapping product will be in an ArcView format with linked databases and completed prior to the workshop. We would endeavor to provide a web-posted, downloadable version, providing that the product is not too large for users to access. It *may* be possible that this

product can be web-posted on an ArcIMS web site to allow potential users to use a fully web-based mapping product.

The pilot mapping product would be reviewed by the Advisory Committee prior to web-posting or circulation.

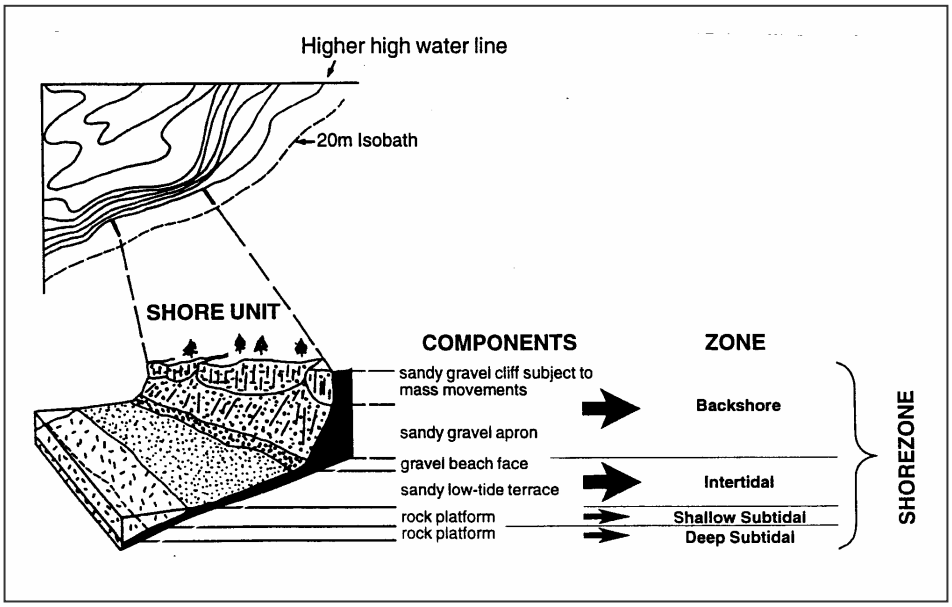

Figure 1. Schematic of the subdivision of the shoreline in *alongshore units* and *across-shore components*.

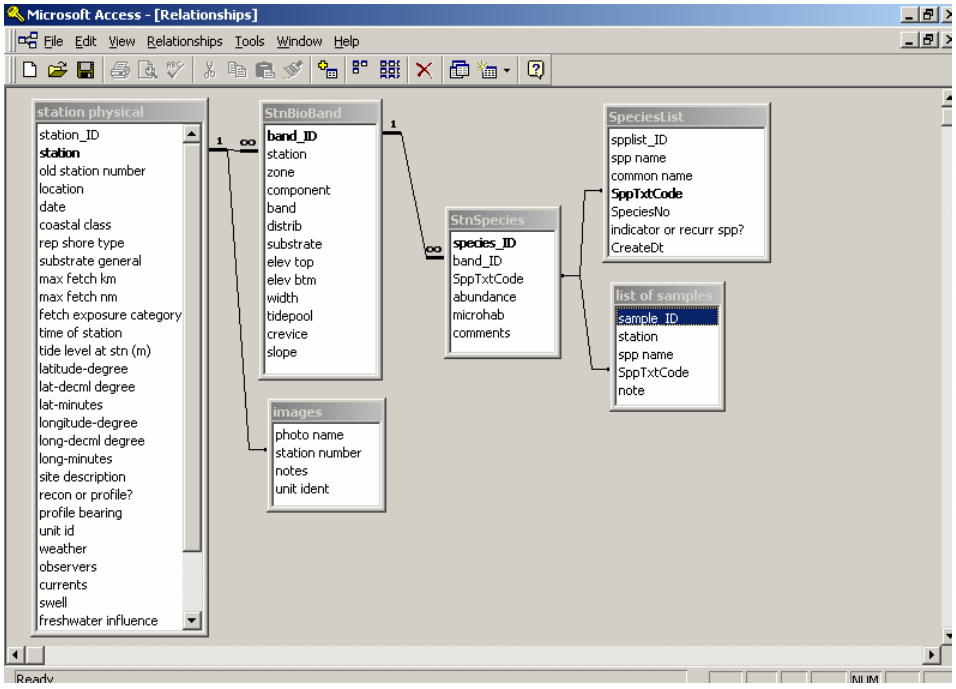

Fig. 2 Schematic of relational database used to catalog ShoreZone ground station data.

Table 1 Summary of Data Attributes Recorded for Each Shore Unit

Category	*Attribute*	*Description*
General	Unit ID	unique identifier used to link database to maps
	Type	polygon, line or point features
	Length	alongshore length of unit
	Area	area of polygon
	Source	sources of imagery
	Mapper	name of mapper
	Map Date	date of mapping
	Editor	name of editor
	Edit Date	date of editing
Exposure	Exposure Calculated	exposure class calculated by GIS model (6 classes)
	Exposure Observed	exposure class observed by mapper (6 classes)
	Exposure Biological	exposure class determined by observed biota within unit
	Effective Fetch	fetch window
	maximum fetch length	maximum measured fetch
	max fetch direction	direction of maximum fetch
	orientation	shore normal direction to shoreline orientation
Shore Character	Shore Type	substrate/morphology summary (34 classes)
	Habitat Type	biological summary based on exposure and substrate (10 classes)
Sediment	Abundance	index of sediment (3 classes)
	Source	source of sediment in unit (3 classes)
	Transport Direction	direction of alongshore transport
Shore Modification	Mod1 type	type of primary shore modification
	Mod1 %	% of shore modification in unit
	Mod1 length	length of shore modification
	Mod2 type	type of secondary shore modification
	Mod2 %	% of shore modification in unit
	Mod2 length	length of shore modification
	Mod3 type	type of tertiary shore modification
	Mod3 %	% of shore modification in unit
	Mod3 length	length of shore modification
Other	Riparian %	% of riparian vegetation in unit
	Riparian Length	length of riparian
	Oil Residence Index	derived estimate of potential oil residence based sediment type and exposure

Table 2 Data Attributes Recorded for Each Across-Shore Component within a Shore Unit

Category	***Attribute***	***Description***
General	Component ID	unique identifier linked component to a unit
	Zone	the elevation of the component in the shore zone (3 classes)
	Sequence	the sequence of the component in the zone
Geologic	Component Morphology	a descriptor of the morphology (22 classes)
	Component Sediment	a descriptor of the sediment (22 classes)
	Component Width	width of component
	Component Slope	slope of component
	Process	dominant process (5 classes)
Biologic (Biobands)	VER	'Verrucaria'
	PUC	salt-tolerant grasses
	GRA	Grasses
	BAR	upper barnacle
	FUC	'Fucus'
	BLGR	Blue-green
	ULV	'Ulva'
	HAL6	'Halosaccion'
	BMU	blue mussel
	RED6	mixed filamentous & blade reds
	ALA1	Intertidal *Alaria* spp. with *Semibalanus cariosus*
	SBR6	Soft browns
	CHB6	Chocolate browns
	RED7	Bright red zone
	ZOS	'Zostera'
	ALA2	Dragon kelp
	NER	Nereocystis

B.3 User Workshop

The ***Pilot Mapping*** result***s***, along with the ***Draft Protocol***, would be presented at a ***Users Workshop*** as part of the vetting. We believe that a Users Workshop is required to acquaint potential researchers and partner agencies with the details of the proposed DRAFT Alaska ShoreZone Mapping Protocol. The workshop will allow potential users to become familiar with the strengths and weaknesses of the system and provide a formal mechanism for incorporating suggestions. The DRAFT Protocol would be circulated with a Pilot Mapping dataset at least 2 weeks prior to the workshop.

Attendance at the workshop would be by invitation and limited to approximately 25 user/partners to be determined by the Advisory Committee and GEM/EVOS. We propose that the Advisory Committee Members be used to moderate the workshop and synthesize comments and suggestions. A two-day workshop, probably within the Anchorage area is proposed.

B.4 Workshop Report

A workshop report will synthesize comments and discussion at the workshop relative to the DRAFT Protocol. If appropriate, the workshop will incorporate the Recommended Alaska ShoreZone Mapping Protocol for use in the GEM Program.

The workshop will also gauge potential agency/institutional interest in the protocol and provide GEM with an implementation scenario if appropriate.

C. Statistical Methods

No specialized statistical analysis is required for the proposed ShoreZone Mapping Program.

D. Description of Study Area

The Protocol development is not region-specific but the Pilot Mapping exercise will be conducted in either the Outer Kenai Coast, including Kenai Fiords National Park, or in Cook Inlet. The coastal communities most likely to benefit from this exercise are Seward, Kenai, Homer, Soldovia and Port Graham.

E. Coordination and Collaboration with Other Efforts

The proposed ShoreZone Mapping Project complements a number of ongoing projects in the region, including existing mapping initiatives by CIRCAC and by Alyeska SERVES. The proposed mapping is a pre-cursor for more detailed mapping/monitoring initiatives being conducted by the Kachemak Bay National Estuarine Research Reserve (KBNERR) as part of GEM. The proposed initiative directly complements interests of the National Park Service (NPS) in Lake Clark, Katmai and Kenai Fiords National Parks. We have already been in direct contact with resource managers at the Sensitive Areas Work Group (Doug Mutter), at NPS (Alan Bennett and Peter Amatto), at Alyeska SERVS(Jule Magee, Sharon Hillman), at CIRCAC (Susan Saupe) and at KBNERR (Carl Schoch). Cooperative groups involved with GRS planning for the GEM region have also been supportive of the ShoreZone initiative (Steve Howell of CIRCAC).

CIRCAC and the Kenai Borough have committed to funding all of the mapping for Cook Inlet and the outer Kenai Coast to Port Bainbridge on the southwestern corner of Prince William Sound as well as to the survey of additional ground survey stations.

IV. SCHEDULE

A. Project Milestones

Objective B.1 Develop a Draft Alaska ShoreZone Mapping Protocol
January/February 2003

Objective B.2 Conduct a Pilot Mapping Project
February 2003

Objective B.3 Conduct an Alaska ShoreZone User Workshop & Revise Protocol
March 2003

Objective B.4 Provide a Workshop Report
April 2003

B. Measurable Project Tasks

The proposed project tasks are organized in terms of our "suggested" schedule.

FY 03, 1st quarter (October 1, 2002-December 31, 2002)
November 25: Project funding approved by Trustee Council

FY 03, 2nd quarter (January 1, 2003-March 31, 2003)
January 13-17: Annual EVOS Workshop
February 15 Draft ShoreZone Protocol completed; distributed
March 15 ShoreZone Users Workshop

FY 03, 3rd quarter (April 1, 2003-June 30, 2003)
April 30: Workshop Report; final ShoreZone Mapping Protocol

V. RESPONSIVENESS TO KEY TRUSTEE COUNCIL STRATEGIES

A. Community Involvement and Traditional Ecological Knowledge (TEK)

No specific program is included for inclusion of TEK as part of this project.

In the Washington ShoreZone project, community groups have welcomed the systematic, state-wide dataset and have groomed the ShoreZone data for use in their own areas of interest (Fig. 3).

B. Resource Management Applications

The ShoreZone mapping data has a range of potential resource management applications; actual uses of the ShoreZone data in Washington and BC are summarized (inset at right).

Resource Management Applications
oil spill sensitivity mapping
GRS site planning
sandlance spawning capability
bird habitat management
recreational planning
riparian vegetation disturbance
shore-zone modification (seawalls)
marine protected area planning
archaeological site potential

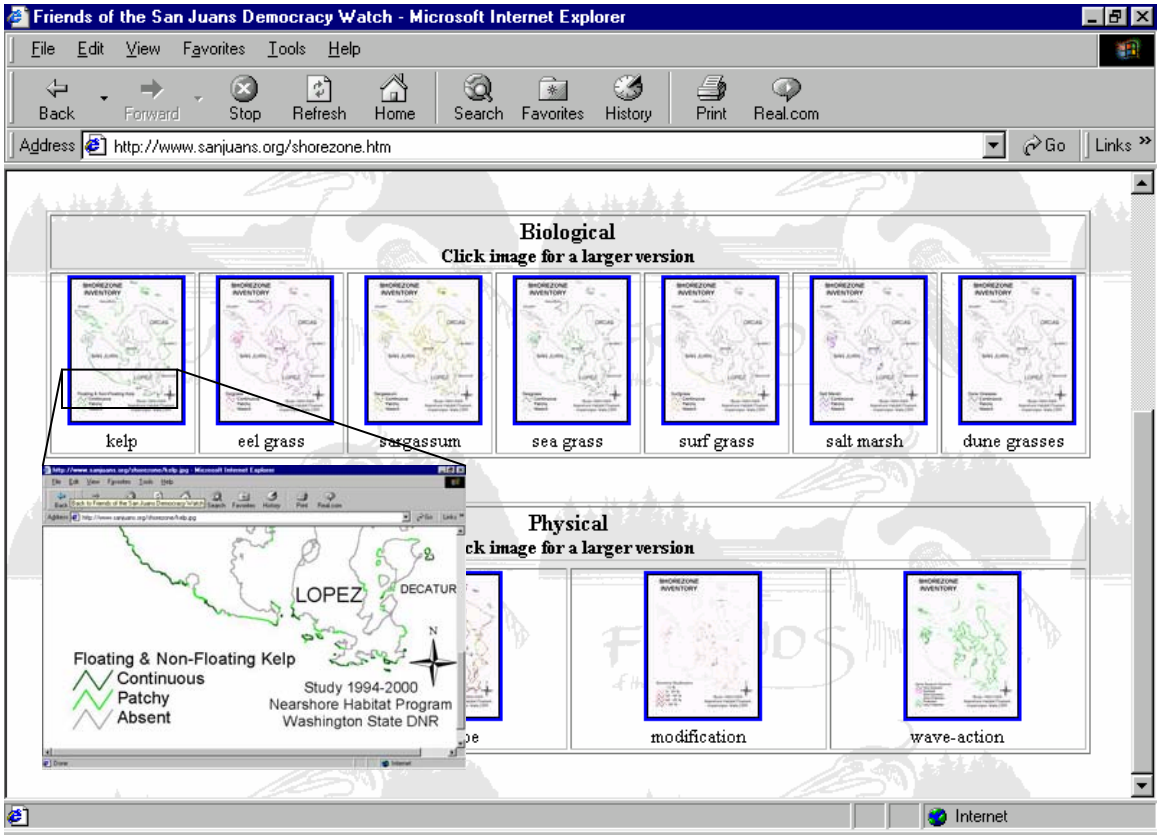

Figure 3 Example of the Washington ShoreZone data adapted by the Friends of the San Juan's for their web site (http://www.sanjuans.org/shorezone.htm). Inset (lower left) shows blow-up of the kelp distribution map

VI. PUBLICATIONS AND REPORTS

We anticipate publishing a peer-reviewed paper summarizing (a) the Alaska ShoreZone Mapping Protocol. The two most appropriate journals appear to be:

1. Coastal Management Journal

2. Journal of Ocean and Coastal Zone Management

VII. PROFESSIONAL CONFERENCES

We anticipate presenting preliminary results at least one scientific conference, preferably one that focuses on the Pacific Northwest. Potential candidates are:

- International Conference on Remote Sensing for Marine and Coastal Environments
- Pacific Estuarine Research Society Conference

VIII. PERSONNEL

A. Principal Investigator (PI)

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B. Other Key Personnel

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C. Contracts

We expect that the Department of Alaska Fish and Game, through the Kachemak Bay Estuarine Research Reserve in Homer would be the most appropriate administrative agency. The primary contract will be to Coastal & Ocean Resources Inc. of Sidney, BC. Biological mapping components will be subcontracted to Archipelago Marine Research Ltd. of Victoria, BC.

IX. PRINCIPAL INVESTIGATOR QUALIFICATIONS

Dr. John Harper is the proposed Principal Investigator. Dr. Harper is the President of Coastal & Ocean Resources Inc. (CORI), a practicing marine geologist and an Adjunct Professor at the School of Earth and Ocean Sciences at the University of Victoria. Dr. Harper's research interest include: coastal and subtidal mapping systems, change detection monitoring in the nearshore marine environment and impact of forestry activities on the nearshore ecosystem. Dr. Harper is currently co-investigator of a major, 5-yr research grant from the Canadian Natural Science and Engineering Council (NSERC) on wood debris impacts on shallow marine ecosystems. A complete professional resume is available at the CORI web site (www.coastalandoceans.com).

Recent relevant projects include:

- ✓ Shore-Zone Mapping of Cook Inlet (2001 to present) - sponsored by the CIRCAC

- ✓ ShoreZone Mapping of Washington (1994-2001) - sponsored by the Department of Natural Resources (DNR); includes the entire coast of Washington from the Columbia River to the Canadian border and development of a mapping protocol (see Harper and Berry 2001).

- ✓ Shore-Zone Mapping of the British Columbia (1981 to 2001) - sponsored by the Burrard Clean Operations Ltd., the BC Ministry of Environment (now Ministry of Sustainable Resource Management); included contract work for most of the physical shore-zone mapping of the 30,000 km shoreline, including the development of the original mapping protocol (see Howes *et al* 1994; Zacharias *et al* 1998).

- ✓ Shoreline Mapping of the Chukchi Sea Coast of Alaska for Oil Spill Planning - sponsored by NOAA; Pt. Hope to Barrow, Alaska (see Harper *et al* 1984)

X. LITERATURE CITED

Harper, J.R., G.A. Robilliard, J. Issacs and E.H. Owens, 1984. Coastal sensitivity analysis of the northern Chukchi Sea coast of Alaska. Proceedings of the 7th Arctic Marine Oil Spill Program (AMOP) Technical Seminar (Edmonton, Alberta), May 1984, Environment Canada, Ottawa, p. 278-294.

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WaDNR 2001. Washington State ShoreZone Inventory. Technical Data Report Distributed on CD-ROM by the Washington State Department of Natural Resources, Olympia, Washington (http://www2.wadnr.gov/nearshore/data/).

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EXXON VALDEZ OIL SPILL TRUSTEE COUNCIL
PROJECT BUDGET

Budget Category:	Proposed FY
Personnel	$21.0
Travel	$8.6
Contractual	$0.0
Commodities	$2.0
Equipment	$0.0
Subtotal	$31.6
Indirect	
Project Total	$31.6
Other Funds	

Comments:

Revised budget is for Development of the Alaska ShoreZone Mapping Protocol and presentation at an Anchorage Workshop in March of 2003.

NOTE: NOAA GA (9%) OF $2.8 NEEDS TO BE ADDED TO THIS PROJECT FOR TOTAL OF $34.4

FY-03

Prepared:

Project Number: G-030641 (Approved TC 11/25/02)
Project Title: GEM ShoreZone Mapping Protocol & /Workshop
Name: John Harper

FORM 4A
NON-TRUSTEE
SUMMARY

EXXON VALDEZ OIL SPILL TRUSTEE COUNCIL
PROJECT BUDGET

Personnel Costs:				Months	Monthly		Personnel
Name		Description		Budgeted	Costs	Overtime	Sum
J. Harper		Protocol Development		0.8	10.5		8.4
N. Borekcy		Protocol Development		0.8	7.0		5.6
S. Ward		Protocol Development		0.3	7.0		2.1
M. Morris		Protocol Development		0.7	7.0		4.9
							0.0
							0.0
							0.0
							0.0
							0.0
		Subtotal		2.6	31.5	0.0	
						Personnel Total	$21.0

Travel Costs:			Ticket	Round	Total	Daily	Travel
Description			Price	Trips	Days	Per Diem	Sum
J. Harper		Protocol Development	1.0	2	5	0.1	2.5
N. Borekcy		Protocol Development	1.0	1	5	0.1	1.5
M. Morris		Protocol Development	1.0	2	0	0.1	2.0
							0.0
							0.0
H. Berry		Workshop Advisor	1.0	1	3	0.1	1.3
D. Howes		Workshop Advisor	1.0	1	3	0.1	1.3
							0.0
							0.0
						Travel Total	$8.6

FY-03

Prepared:

Project Number:
Project Title: GEM ShoreZone Mapping Protocol & /Workshop
Name: John Harper

FORM 4B
Personnel
& Travel
DETAIL

EXXON VALDEZ OIL SPILL TRUSTEE COUNCIL
PROJECT BUDGET

Contractual Costs:			Contract Sum
Description			
		Contractual Total	$0.0

Commodities Costs:			Commodity Sum
Description	Units	Cost/Unit	
meeting room + lunches	2	1	2.0
		Commodities Total	$2.0

FY-03

Prepared:

Project Number:
Project Title: GEM ShoreZone Mapping Protocol & /Workshop
Name: John Harper

FORM 4B
Contractual & Commodities DETAIL

EXXON VALDEZ OIL SPILL TRUSTEE COUNCIL
PROJECT BUDGET

New Equipment Purchases:	Number of Units	Unit Price	Equipment Sum
Description			
			0.0
			0.0
			0.0
			0.0
			0.0
			0.0
			0.0
			0.0
			0.0
			0.0
			0.0
			0.0
Indicate replacement equipment purchases with an R.		**New Equipment Total**	$0.0

Existing Equipment Usage:	Number of Units	
Description		

FY-03

Project Number:
Project Title: GEM ShoreZone Mapping Protocol & /Workshop
Name: John Harper

FORM 4B
Equipment
DETAIL

Prepared:

6/16/2005