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GEM PROPOSAL SUMMARY PAGE

(To be filled in by proposer)

Project Title:	Alaska Natural Geography In Shore Areas: Year 2 of a Census of Marine Life Initial Field Project
Project Period:	October 1st, 2003 through September 30th, 2004-- "FY 04-FY 05"
Proposer(s):	Brenda Konar and Katrin Iken School of Fisheries and Ocean Sciences University of Alaska Fairbanks Fairbanks Alaska 99775-7220 bkonar@ims.uaf.edu and/or iken@ims.uaf.edu 907-474-5028 and/or 907-474-5192
Study Location:	Kodiak Island, Prince William Sound and Kachemak Bay

Abstract: This proposal seeks funding to complete the initial nearshore biodiversity surveys that were started in the summer of 2003 in Kodiak Island, Prince William Sound and Kachemak Bay. These surveys are part of a pole-to-pole latitudinal gradient in macroalgal rocky bottom and seagrass soft bottom habitats that is applying standardized protocols developed under the Census of Marine Life program. In our second year of funding we will resurvey all sites that were sampled in 2003 for temporal resolution and will retrieve the temperature data loggers that were deployed at all sites in 2003 so that physical data can be incorporated for each study site. The project is heavily based on local community involvement for sampling. Expected outcomes are establishment of a biodiversity database for current regional and global comparisons and future long-term monitoring programs, capacity building, and a broad outreach to the public.

Funding:	EVOS Funding Requested:	FY 04	$ 228,175	
		FY 05	$	
		FY 06	$	TOTAL: 228,175
	Non-EVOS Funds to be Used:	FY 04	$	
		FY 05	$	
		FY 06	$	TOTAL:

Date: June 2003

I. NEED FOR THE PROJECT

A. Statement of Problem

The potential loss of marine biodiversity has recently spurred an increasing number of studies to identify the importance of biodiversity for ecosystem functioning (Loreau et al. 2001, Pachepsky et al. 2001, Cardinale et al. 2002). Biodiversity is one potential measure of ecosystem health and of biological interactions such as competition, disturbance, facilitation, predation, recruitment, and productivity of a system (Petraitis et al. 1989, Worm et al. 1999, Mittelbach et al. 2001, Paine 2002). On a larger scale, biodiversity measurements can serve as an indicator of the balance between speciation and extinction (McKinney 1998 a,b, Rosenzweig 2001).

Compared to a wealth of information available on terrestrial biodiversity, marine biodiversity estimates are probably still largely underestimated (Lambshead 1993, Williamson 1997). Within the last decade the need for nearshore biodiversity studies on large spatial scales has become increasingly obvious for the intent of conservation and establishment of Marine Protected Areas (Shaffer et al. 2002, Ten Kate 2002, Eiswerth & Haney 2001, Cabeza & Moilanen 2001, Zacharias & Roff 2000, Vanderklift et al. 1998, Costello 1998,Waugh 1996, Norse 1995). We have now started to understand that biologically diverse communities are more resilient to environmental and ecological stress and disturbances, e.g. from invasive species (Kennedy et al. 2002).

The sustainable use of coastal biodiversity has to be one of the major efforts in our conservation and management efforts (Gray 1997a, b, Price 2001). Limited resources and manpower often limit the amount of studies possible, but in nearshore investigations, especially intertidal work, the involvement of volunteers and local communities can make a significant contribution (Evans et al. 2001). Therefore, biodiversity is becoming one of the key criteria in the management of marine habitats and Marine Protected Areas (Ray 1985, Olsen 1999, Ward et al. 1999). Although many attempts have been made to measure and evaluate biodiversity, small- and large-scale comparisons are hampered by the fact that usually different methods have been applied (France & Rigg 1998). For a comparative biodiversity assessment on multiple scales, within an area, between areas or among global gradients, a unified approach is needed (e.g. Rabb & Sullivan 1995, Valero et al. 1998, Mikkelsen & Cracraft 2001). The Census of Marine Life program and its associated projects are such a framework for a global study of biodiversity.

The Census of Marine Life (CoML) was implemented as a major international research program assessing and explaining the diversity, distribution, and abundance of marine organisms throughout the world's oceans. It will culminate in 2010 with reports on what is known, what may be unknown but knowable, and what we may never know or at least not know for a very long time about marine biodiversity. The History of Marine Animal Populations (HMAP) project, the Future of Marine Animal Populations (FMAP) project, and a series of Initial Field Projects are being combined in the Ocean Biogeographic Information System (OBIS) database, which will be a powerful and accessible tool for viewing, understanding and predicting the future of life in the oceans.

NaGISA (Natural Geography in Shore Areas) is the initial field project within the Census of Marine Life that focuses on biodiversity in nearshore macrophyte communities. These communities are particularly important because kelp and other seaweeds are an important source of carbon for the nearshore and many transient biota (Duggins et al 1989, Simenstad et al 1993, Duggins and Eckman 1994, 1997). This habitat type also is distributed globally and therefore, the ultimate aim of NaGISA is a global biodiversity comparison. Since 2002, the Japanese regional center (NaGISA; Yoshihisa Shirayama) has been working with a number of countries in the Western Pacific in core areas and sampling sites along an equatorial longitudinal gradient from the east coast of Africa to the Palmyra Atoll. The Alaska center (ANaGISA; Brenda Konar and Katrin Iken) is working towards covering a pole-to-pole latitudinal gradient with emphasis on Alaska sites. Currently, our Alaska Center has received funding through the Gulf of Alaska Ecosystem Monitoring and Research Program and has begun sampling locations in Kodiak Island, Prince William Sound and Kachemak Bay in the summer of 2003. Other proposals to expand the latitudinal biodiversity surveys are pending or in preparation for the Aleutian Islands, Commander Islands, Kamchatka Peninsula, Beaufort Sea (Camden Bay and the Boulder Patch) and the Antarctic (Palmer and McMurdo Stations). The Alaska Center also is working closely with researchers from Southeast Alaska and California to assist them in attaining funding to sample their areas. Other countries that have adopted these protocols and are going to be contributing data for the global comparison include Russia, Canada, Mexico, Venezuela, Argentina, Brazil, Colombia, Equador, French Guiana, Peru, Uruguay, Chile, Australia, Taiwan, Thailand, Indonesia, Malaysia, Vietnam, Philippines, China, and Korea. The results of this project will truly be a global comparison of diversity patterns in ubiquitous nearshore macrophyte habitats.

There has been much work done in the Gulf of Alaska. We have listed some of the references in Section IX by core area (Kodiak Island, Prince William Sound and Kachemak Bay). We have taken this vast amount of research into consideration when choosing the study sites. Optimally, our sites are accessible to native communities, have local infrastructure, have long-term data, and are relatively pristine.

B. Relevance to GEM Program Goals and Scientific Priorities

This proposal is for the continuation of a funded FY03 project focusing on nearshore habitats in the Northern Gulf of Alaska, one of the key habitat types targeted by the GEM program. When the Exxon Valdez oil spill happened in March 1989 it quickly became obvious that insufficient baseline data were available to evaluate the impact of this catastrophe. In establishing the GEM Program, the Trustee Council explicitly recognized that complete recovery from the oil spill might not occur for decades. Baseline data and long-term observations are needed for improved management of the injured resources and to help improve understanding of the marine and coastal ecosystem. In addition, increased knowledge of critical ecological information about the northern Gulf of Alaska is needed for the prudent use of the natural resources in the spill area without compromising their health and recovery.

The Exxon Valdez oil spill had particularly strong effects on the intertidal and shallow water areas where oil was drifted and accumulated. These nearshore areas are very productive and highly structured, and thus harbor a high diversity of marine life. These coastal regions also are

important nurseries and refuges for fish as well as bird and marine mammal feeding grounds. Therefore, one of the main GEM goals is "to help understand and 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 its productivity is influenced by natural changes and human activities". This ANaGISA project is a biodiversity project that focuses on these nearshore habitats and that provides valuable baseline data that are urgently needed to fulfill the GEM mission. Specifically, ANaGISA addresses the mission of GEM to detect annual changes and long-term changes in the marine ecosystem. The funding provided in 2003 allowed sampling on a broad spatial scale with sites in Prince William Sound, Kachemak Bay and Kodiak Island. Continuous funding in 2004 is requested through this proposal to re-sample all sites in 2004 to obtain annual temporal resolution. Monitoring of long-term changes could be covered through follow-up projects applying the NaGISA protocol. This ANaGISA project also fulfills the GEM mission of providing integrated and synthesized information. Site selection of ANaGISA sampling was done in cooperation with other ongoing projects to maximize synthesized information for the areas (see Section D). As part of a global nearshore biodiversity effort, ANaGISA also provides the unique opportunity to integrate Gulf of Alaska biodiversity information into a larger geographic context. One of GEM's missions is also to provide resource managers with information to enable them to predict the status and trends of natural resources. The baseline data obtained through the ANaGISA project will be an excellent tool for habitat management and long-term monitoring. And finally, ANaGISA has the same interest as GEM in involving stakeholders in their research who will benefit both monitoring and research efforts in the Gulf of Alaska.

The GEM Program Document also describes various implementation goals to achieve the program goals. These include 1) integrate monitoring and research results to convey a "big picture" status for the Gulf of Alaska, 2) track work of other entities relevant to understanding biological production in the Gulf of Alaska, 3) leverage funds to augment ongoing monitoring work funded by other entities, 4) involve other agencies, organizations, and local communities and 5) facilitate application of GEM research and monitoring results to benefit conservation and management of marine resources. As is obvious in this proposal, ANaGISA is going to reach its goals with a similar implementation plan. We are going to integrate and compare data collected from three core areas within the Gulf of Alaska, which will eventually be used in larger scale or even global context. This global context will be attained through cooperative efforts with other funds, agencies, and organizations. The key for ANaGISA to work is in its community involvement.

ANaGISA has been funded in 2003 though the GEM Phase II Invitation, with recommendation for continuous funding in 2004. Proposals in this invitation were requested to "conduct baseline research on diversity and distribution of marine organisms at one or more locations within the GEM area". Our biodiversity study is conducted at three locations (with replicate study sites within each location) in the GEM target area, the Gulf of Alaska. The invitation also stated that research sites should be selected based on a number of criteria including: availability of historical data, proximity to other research areas, relative level of pristineness, long-term stability, accessibility and representativeness. These are the criteria that were used in selecting the study sites for the ANaGISA study. Lastly, the invitation asked for proposals that would use the coastal monitoring protocols being developed under the Census of Marine Life and the Diversitas

Western Pacific and Asia (DIWPA) programs. ANaGISA is part of the initial field projects under the Census of Marine Life and sampling is based on these standardized protocols.

II. PROJECT DESIGN

A. Objectives

The objectives of our proposal are

1. to provide nearshore biodiversity data according to a standardized sampling protocol to serve as local baseline data for biodiversity comparisons and monitoring purposes
2. to examine temporal variability of biodiversity in the Gulf of Alaska
3. to relate biological diversity to ambient environmental parameters
4. to compare biodiversity on local, regional and larger (global) geographical scales
5. to increase capacity building through local community involvement in sampling efforts

Achievement of these objectives will create a baseline for long-term monitoring and management programs as well as for further understanding of ecosystem functioning through process-oriented projects. By being part of a global biodiversity effort, the overall outcome will be larger than the local scope alone. The use of standardized sampling and analysis protocols will allow incorporating biodiversity data from the Gulf of Alaska into larger-scale comparisons and thus help answer important ecological and biogeographical questions about biodiversity and latitude.

B. Procedural and Scientific Methods

The ANaGISA project is following the standardized sampling procedure developed within CoML for baseline nearshore biodiversity coverage to ensure comparability of our data with those of other NaGISA study sites (Nakashizuka & Stork 2002). All sampling sites are centered in large algal/had bottom communities and sea-grass/soft bottom communities, which are highly complex and globally distributed, and which also represent important habitat types along the Alaska seashore. A two-year sampling effort is necessary to obtain a minimum temporal resolution for biodiversity estimates. We are completing the first year of this sampling for biodiversity and are deploying data loggers this summer (2003). This proposal seeks funding to re-sample the biodiversity sites in 2004 for temporal resolution and to retrieve the data loggers, which are collecting hourly temperature data at each sampling strata at each site. For each study site, replicate samples are being collected at the high, mid and low intertidal strata and at 1, 5, 10 and 15m subtidal water depth. Initial taxonomic analysis will focus on visible organisms (>0.5mm) associated with large algal and sea-grass communities, but a full spectrum of samples including meiofauna (>63µm) will be collected and preserved for analysis as resources become available. As part of this proposal, we will sort and identify all macroorganisms collected. We have gathered a group of taxonomic specialists to assist in species identification. Voucher specimens for all these organisms will be collected and stored at the University of Alaska Museum.

The standardized protocols are designed to sample hard bottom macroalgal communities and soft-bottom seagrass communities. For the hard bottom habitat, five replicate samples along the

high, mid and low intertidal strata and at 1, 5, 10 and 15m water depth are collected in the most randomized fashion along each strata. Every replicate consists of three different sized quadrats that are sampled at two levels of increasing difficulty. Within a 1x1m quadrat, a photographic image record (non-destructive) is made immediately prior to sampling. All macrophytes and conspicuous macrofauna (>2cm length) within the 1x1m quadrat are identified *in-situ*, and either counted (large solitary macroflora and conspicuous fauna such as crabs, seastars, sea cucumbers, etc.) or an estimate of percent cover made (small macroflora and colonial organisms). Adjacent to the 1x1m quadrat, a 50x50cm quadrat is placed, and within each 50x50cm quadrat, a 25x25cm quadrat is placed always in the same position within the larger sample. Within the 50x50cm quadrat all macroalgae are completely removed, except for those in the 25x25cm area. This 50x50cm sample is taken in order to ensure sufficient algal reference material to support the *in-situ* observation. In each 25x25cm quadrat, a photographic image record is made immediately prior to sampling. All macrophytes and fauna within the quadrat are carefully and completely removed and collected into a 63µm mesh bag.

In seagrass communities, five random replicate samples are taken in the center of the seagrass bed in the most randomized fashion. Each replicate consists of a 50x50cm quadrat in which counts are made of solitary fauna, flora and seagrass shoots. Percent cover estimates of seagrass and other organisms are made. Adjacent to the quadrat, a 15cm diameter cylindrical core is taken to 10cm substrate depth. All organisms within the core sample are collected into a 63µm mesh bag.

All quantitative samples are sieved immediately after sampling on nested meshes of 0.5mm and 63µm. Macroflora retained on the 0.5mm mesh is sorted, wet weight taken and a herbarium voucher prepared. A wet weight-dry weight ratio is determined for each macroalgal species for weight conversions. Macrofauna retained on the 0.5mm mesh is preserved in buffered 5% seawater-formalin solution for later sorting and identification during the project. Meiofauna retained on the 63µm mesh is also preserved and stored for identification as more resources become available.

Physical descriptions at each sampling site include temperature (deployment of dataloggers at each depth strata to obtain hourly temperature readings for one year), as well as lights readings at each sampling strata and salinity measurements at the day of sampling.

C. Data Analysis and Statistical Methods

All quantitative data collected for this project will be entered into the international, fully georeferenced NaGISA database. This database will be able to be accessed by other researchers and the general public through the Ocean Biogeographic Information System (OBIS). This is a powerful tool that will allow for global, large-scale comparisons to be made.

Biodiversity will be analyzed from non-destructive photographic images as well as destructive transect samples. Diversity is divided into two components: “species richness” and “evenness”. Species richness is simply defined as the number of species present while evenness is a measure of the distribution of population sizes of the respective species (Levinton 1982). To describe the structural characteristics of the communities, we will use the Shannon Weaver index (Shannon &

Weaver 1949). It is the diversity index with the widest application and will allow comparison on many different scales, but data also will be applied to newer diversity analyses such as Primer (www.primer-e.com).

The Shannon Weaver index is based on data obtained from random samples drawn from a large community (Krebs 1985). It is defined as

$$H' = -\sum_{i=1}^{s} p_i \, (\ln p_i)$$

with p_i as the relative abundance of each species i ($0 = p_i = 1$)
and s as the number of species
and ln = $\log_e$

The value of H' is greater the more even the number of individuals per species are distributed. H' usually ranges between 0 and ln of the number of species present. Hence, the index equally accounts for species richness and evenness. The evenness is a measure of the distribution of the individuals in the species, independent of the number of species present. Evenness is a relative measure and is defined as (Pielou 1969):

$$E = \frac{H'}{H'_{\max}}$$

with H' as the measured diversity
and $H'_{\max}$ as the maximum diversity, calculated as $H'_{\max} = \ln s$

Evenness is 0 if only one species is present in the sample, and the maximum value for E is 1 if several species are present with the same abundance.

The importance of rare species may be underestimated by using the Shannon Weaver index (Hurlbert 1971). To account for rare species, Hurlbert (1971) developed a diversity index $E(Sn)$ that is based on the rarefaction method of Sanders (1968). Rarefaction methods, both sample-based and individual-based allow for meaningful standardization and comparison of datasets. We will use the Hurlbert index in samples where we encounter rare species.

$$E(Sn) = \sum_{i} \left(1 - \frac{\begin{bmatrix} N-Ni \\ n \end{bmatrix}}{\begin{bmatrix} N \\ n \end{bmatrix}} \right)$$

with $E(Sn)$ as the expected number of species within a sub-sample with n randomly selected individuals. The sub-sample is taken from a sample with N individuals, S species and the respective abundance Ni of all species i.

We will also calculate dominance of species, which is defined as the relative proportion of a species of the total number of individuals per sample. Dominance is presented in logarithmic rank frequency distributions (Lambshead et al. 1983), and gives information on the proportion of

the most dominant species in total abundance and on the number of species that represent 90% of total abundance.

Many attempts to describe complex communities by one single attribute, such as richness, diversity or evenness, can be criticized because valuable information is often lost. We are trying to circumvent some of these problems by using various measures including the Hurlbert index for rare species, but we will also construct rank-abundance diagrams for all cores areas and study sites. A more complete picture of the distribution of species abundances in a community can be made using the full array of P_i values by plotting P_i against rank (Begon et al. 1990; where P_i = the proportion of total individuals in the *i*th species). Thus the P_i for the most abundant species is plotted first, then the next.

D. Description of Study Areas

Gulf of Alaska

Core sampling areas in the currently funded ANaGISA project are located in the Gulf of Alaska, specifically in Prince William Sound, Kachemak Bay and Kodiak Island. Biodiversity coverage within the project thus spans longitudinally from 147°06'W to 154°15'W and latitudinally from 56°45'N to 60°39'N. All core areas are under influence of the Alaska Coastal Current and are subject to substantial tidal movement. On more exposed sites, rocky intertidal with macroalgal cover extends into subtidal kelp beds. In more sheltered areas at the head of bays seagrass beds prevail. In all core areas we have coordinated our sampling with ongoing or past projects to maximize information output and for highest compatibility of results.

In Kodiak, we have met with researchers from the Gulf Apex Predator project (GAP), the Nearshore Habitat Use by Commercial Fish Around Kodiak Island project and the Mapping Marine Habitat-Kodiak Island project. GAP is primarily interested in ecosystem relationships that involve top predators (Steller sea lions, fish, whales, etc.). The Habitat Use project is funded by the Cooperative State Research, Education and Extension Service to survey essential fish habitats in bays around Kodiak. The Mapping Marine Habitat project is an island-wide aerial mapping project funded by GEM. In Kodiak, ANaGISA is using its biodiversity data for ground-truthing for these other projects. We have discussed this with Bob Foy (PI of the habitat use and mapping projects) and GAP PIs (Kate Wynne, Bob Foy and Loren Buck) and we agreed that this collaboration is beneficial to all projects. Four areas that would be most beneficial to ground-truth for the habitat project, the mapping project, and GAP include Sitkalidak Straight, Alitak Bay, Uyak Bay, and Kuzuyak Bay. All of these areas are of scientific interest because of the presence of various marine mammals including harbor seals, Steller sea lions, sea otters, and assorted whales and their prey. In addition to the connection to other ongoing research programs, these areas are of particular interest to ANaGISA because they have native communities (Old Harbor in Sitkalidak Straight, Akhiok in Alitak Bay, Larson Bay by Uyak Bay, Port Lions in Kuzuyak Bay), and are relatively pristine. They also comply with the site criteria proposed by GEM and the NaGISA standardized protocol because historical data are available (see reference list in Section X). These Kodiak sites will be sampled in June 2003 using the vessel "Mythos" (Captain Dave Kubiak) as the platform.

For all Kodiak sampling, we are working with the Youth Area Watch program (Teri Schneider) to assist us to get help for the destructive intertidal sampling. We are involving kids from the various native villages that we are working by so that we can interact with and teach them how to collect biological samples and help increase their interest and awareness in their natural resources. We feel this local involvement is essential for our work.

In Prince William Sound, discussions with local researchers (Loren Buck, David Irons, Raymond Highsmith, Jim Bodkin, Stephen Jewett, Howard Feder and Arny Blanchard) for study site selection revealed Naked Island (seagrass site), Knight Island (Herring Bay), Green Island, and Montague Island (all macroalgal sites) as prospective sampling sites. All of these sites have some historical data on intertidal and sublittoral fauna and flora already available from numerous detailed reports from the Exxon Valdez oil spill investigations (see Section X). Many sites also have current or future research planned at them. Sampling of these sites was completed in May 2003, using the vessel "Tempest" (Captain Neal Oppen, Valdez) as the platform.

Because of logistics (distance of sampling sites from villages) and liability issues in working off a vessel in Prince William Sound, we could not include Youth Watch kids in the intertidal sampling. In 2003, we contacted the local native community of Tatitlik for adult volunteers but were unable to interest the community in participating. Instead, we have focused on capacity building and have involved undergraduate and graduate students in our sampling. These students had the opportunity to learn about an unfamiliar habitat type and gain field experience. This experience has profoundly increased their awareness about coastal systems and the connectivity to oceanic processes. As a result, one undergraduate student will now pursue a Masters degree in Marine Biology with emphasis on kelp forest ecology. We will attempt to create interest in the native village of Tatitlik again in 2004 by giving a public lecture on the project and its outcomes.

We chose Kachemak Bay as another of our core areas because of the amount of past and present research conducted there, the high quality of infrastructure such as the Kasitsna Bay Marine Laboratory and the Kachemak Bay National Research Reserve and the relative pristiness. Kachemak Bay is also a newly designated National Estuarine Research Reserve. In Kachemak Bay, we contacted local researchers (Susan Saupe, Raymond Highsmith, Carl Schoch, Glenn Seaman, and Loren Buck) to get input into study site selection. We have chosen Cohen Island, Elephant Island, Outside Beach and Jakolof Bay. The first three sites are rocky hard-bottom habitats while the latter is a seagrass/soft-bottom habitat. For most sites in Kachemak Bay historical data and current project data are available (see Section IX). For sampling the Kachemak Bay sites we are based at the Kasitsna Bay Marine Laboratory. The sampling of these sites is currently being conducted and will be finished in June 2003.

For the Kachemak Bay sampling, we have been working with the Seldovia High School (Janet Shepard) and the Seldovia Village Tribal Council (Lillian Elvsaas and Crystal Collier) to supply local assistance with the destructive intertidal sampling. Local response has been very enthusiastic and profound interactions have developed.

In addition to local community involvement for the intertidal sampling, the fieldwork for the summer of 2003 was combined with the University of Alaska Fairbanks summer Kelp Forest Ecology class taught by Konar. As such, all students traveled to all three core areas and assisted

in subtidal non-destructive and destructive sampling and sorting. This course was open to undergraduate and graduate students. Undergraduates wanting to do a senior thesis and graduates were required to complete an individual project on a related biodiversity question that could be incorporated with the ANaGISA program. The projects chosen by the students this year all involve different aspects of comparing biodiversity of organisms inhabiting kelp holdfasts (such as varying kelp holdfast species, water depth and location). It is hoped that these projects will be combined into a publishable work. Similarly, intertidal sampling in Kachemak Bay was combined with the UAF Marine Biology and Ecology field course taught by Iken. Besides undergraduate and graduate students from Fairbanks, Juneau and Pittsburgh, also an Anchorage science teacher and a local naturalist participated in the course, broadening the outreach component of the project.

Additional Core Areas

At this point, we are concentrating on establishing biodiversity study sites according to the NaGISA protocol, which is intentionally "low-tech" so it can be compared to sampling at many other sites along the planned latitudinal and longitudinal gradients. Once the initial sampling of these study areas is complete, we hope to expand these protocols to include other areas within the Gulf and also other Alaska communities (Prudhoe Bay, Barrow, Point Hope, Kotzebue, Nome, Bethel, Togiak, Dillingham, Port Moller, Akutan, Adak, Yakutat, Glacier Bay, Sitka, Juneau etc.). This will expand the anticipated latitudinal gradient throughout Alaska. Site selection in these new core areas will again be through interaction with monitoring and other research groups already active in those areas (e.g. Glacier Bay National Park Service, Aleutian Maritime National Wildlife Refuge, UAF Marine Advisory Programs, researchers at University Southeast, local agencies and communities). The next step in expanding the latitudinal gradient further will be to contact other monitoring and biodiversity groups along the Pacific coast of the US (e.g. PISCO program). We feel that the best and most efficient way to accomplish our goals now and in the future is through local community involvement. This does not only provide manpower for the sampling but also creates curiosity and caring for the local natural history and potential involvement in long-term ecological monitoring. For these expansions we will seek funding through agencies such as the Alaska Sea Grant, North Pacific Research Board, Coastal Marine Institute, Project AWARE Foundation, Cooperative Institute for Coastal and Estuarine Environmental Technology, and smaller, local groups.

For the core areas selected so far (Kodiak, Prince William Sound and Kachemak Bay) we feel that our study could provide the baseline data for long-term monitoring projects. Applying the NaGISA protocols now will allow us to evaluate the suitability of selected sites for long-term monitoring. Monitoring effort will have to be coordinated with other agencies and ongoing programs to expand the amount of replicate sampling as well as to expand from only pristine areas to a comparison with human impact sites.

E. Coordination and Collaboration with Other Efforts

This ANaGISA project is tightly linked to the NaGISA initial field project within the Census of Marine Life program and other biodiversity-related organizations. The NaGISA consortium includes DIWPA (Diversitas Western Pacific and Asia, Yoshihisa Shirayama), NaGISA-South

America (Miriam Fernandez, Victor Gallardo) and NaGISA-California (Matt Edwards). All these regional groups are applying the same standardized protocols, so large-scale comparisons will be possible. Each of these groups seeks funding through local sources to accomplish sampling. Other regional groups that are about to initiate NaGISA sampling are Australia, South America, Russia and several European countries.
For the pole-to-pole latitudinal gradient the Alaska center (ANaGISA) is in contact with other groups conducting research in the Antarctic, e.g. Angelika Brandt (Germany, ANDEEP program) and Paul Rodhouse (British Antarctic Survey). In April 2003, an international CoML Arctic Biodiversity workshop organized by Iken and Konar in Fairbanks, Alaska, initiated considerable interest in applying the NaGISA protocol along the Arctic coastline (e.g. Canadian Arctic, Russian Arctic, Greenland, Svalbard).
Organizations supporting the implementation of NaGISA biodiversity work include funding from the Sloan Foundation ($310,000 in 2002), which has allowed us to set up the NaGISA administrative centers in Fairbanks and Japan. This funding also allowed Japan to begin the longitudinal sampling. JSPS (Japan Society for the Promotion of Science) is primarily funding scientific exchanges with neighboring Pacific countries for the NaGISA program. There is about $100,000 per annum available for coastal biodiversity from 2001 to 2011. Some GBIF (Global Biodiversity Information Facility) funding will be available for the OBIS database.

III. SCHEDULE

A. Project Milestones

Objective 1: Provide nearshore biodiversity data according to a standardized sampling protocol to serve as local baseline data for biodiversity comparisons and monitoring purposes
To be met by July 2004

Objective 2: Examine temporal variability of biodiversity in the Gulf of Alaska
To be met by May 2005

Objective 3: Relate biological diversity to ambient environmental parameters
To be met by May 2005

Objective 4: Compare biodiversity on local, regional and larger (global) geographical scales
To be met by May 2005

Objective 5: Increase capacity building through local community involvement in sampling efforts
To be met by July 2004

B. Measurable Project Tasks

FY04, 1st quarter (October 1, 2003-December 31, 2003)
October: Project funding approved by Trustee Council
December 30: Finish sorting and constructing vouchers of 2003 sampling

FY04, 2nd quarter (January 1, 2004-March 31, 2004)
(January 12-16 (tentative): Annual EVOS Workshop
March 31: Finish identifying organisms and vouchers of 2003 sampling
Organize 2004 field sampling

FY04, 3rd quarter (April 1, 2004-June 30, 2004)
June 30: 2nd year sampling Kachemak Bay

FY04, 4th quarter (July 1, 2004-September 30, 2004)
August 30: 2nd year sampling Kodiak Island
September 30: 2nd year sampling Prince William Sound

FY05, 1st quarter (October 1, 2004-December 31, 2004)
December 30: Finish sorting and voucher creation of 2004 sampling

FY05, 2nd quarter (January 1, 2005-March 31, 2005)
(Dates not known yet) Annual EVOS Workshop
March 31: Finish identifying all organisms of 2004 sampling

FY05, 3rd quarter (April 1, 2005-June 30, 2005)
May 31: Finish statistical analysis of samples
June 30: Submit final report (including draft manuscripts for publication) to Trustee Council Office

This ANaGISA proposal to GEM is seeking support to complete the initial sampling in the Gulf of Alaska started in 2003. At this time, we request funding to re-sample our core sites and to retrieve data loggers in the summer of 2004. Although we only request funding until the end of 2004, analysis of the second sampling and the preparation of manuscripts may extend into early 2005.

The larger scale or even global analysis of biodiversity samples obtained in various NaGISA projects will take time and the completion of the entire latitudinal transect is anticipated not earlier than in 2008. As short-term milestones of the ANaGISA project, however, there will be many opportunities to publish results of individual transects, which will serve as a basis for essential environmental management programs (see Section VI). Although the focus of ANaGISA at this point is to provide baseline data for GEM target habitat types, it is hoped that a longer-term commitment of monitoring selected sites can be developed with future funding.

IV. RESPONSIVNESS TO KEY TRUSTEE COUNCIL STRATEGIES

A. Community Involvement and Traditional Ecological Knowledge (TEK)

We feel that the best and most efficient way to accomplish the goals of this ANaGISA project now and in the future is through local community involvement. Supervised intertidal sampling

allows including school kids in the actual sampling procedure. This not only provides manpower for the sampling but also creates curiosity and caring for the local natural history and potential involvement in long-term ecological monitoring. We have made contact with the local Youth Watch Programs and local native communities and are involving individuals at two of our core sites in the intertidal sampling. We are working with Teri Schneider from the Kodiak Youth Watch Program and with Lillian Elvsaas and Crystal Collier from the Seldovia Native Tribal Council to organize involvement of kids. Our project was received enthusiastically by these groups and we are excited about the involvement of these interested kids.

B. Resource Management Applications

The immediate goals of providing biodiversity baseline data and of examining latitudinal gradients in the biodiversity of macrophyte communities are met by the intensive, but traditional approach outlined in this proposal. The information gleaned here will be useful to resource managers. Information on habitat distribution, species lists, diversity measures and related environmental data will be readily available to be used for site descriptions, habitat mapping and monitoring site selections. The quantitative data obtained in this project are entered into a publicly accessible NaGISA database, and can hence be used by resource managers. The NaGISA database can further be accessed through the OBIS (Ocean Biogeographic Information System) database. OBIS is an open link between many fully georeferenced diversity databases (e.g., Fishbase, Cephbase, National Ocean Data Center) and thus allows the regional synthesis of various data sources. One example of such synthesis is species distribution maps that can be easily created through OBIS. OBIS, and the NaGISA database, are under stringent quality control, e.g., only fully georeferenced data and species identifications with indication of the taxonomic expert can be entered. These data thus provide a reliable and readily accessible source of information to resource managers that can be used in a number of different applications. These applications could involve management of recreational activities, evaluation of impacts of exploitation activities such as logging and species distribution ranges to monitor for invasive species.

In addition to this basic knowledge, the full set of collected but not yet analyzed meiofaunal samples may provide the basis for a future discovery program with the potential to characterize hundreds of thousands of new species of meiofauna along the gradients. This is a challenge that requires a breakthrough approach. Traditional taxonomic methodology has failed to deal with the sheer magnitude of biodiversity in groups such as the nematodes. Genetic applications ("the barcode of life") and a new technology that is currently under development though the Japan NaGISA Administrative Center may provide tools to gain deeper insight into this aspect of biodiversity. This new technology includes automated sorting of meiofaunal samples using flow-cytometry techniques, suspension of the organisms in a gel and holographic imaging of the organisms. Computers with trainable software can be used to recognize these holographic images and provide key data for the description of new species. These technologies all exist and are in use for other purposes, but it will take a well focused program to plan the stages and bring the appropriate experts, technologies and manufacturers together to produce a working system. However, once developed the system should be of great value in a wide range of habitats as it will be applicable to routine monitoring and beneficial to resource managers.

V. PUBLICATIONS AND REPORTS

The ANaGISA project design of three core areas (Kodiak, Prince William Sound and Kachemak Bay) with four study sites within each core area will allow for biodiversity comparisons within and between these core areas. The two-year time span of this project will allow for temporal comparisons. This will provide an excellent estimate of the biodiversity range present in the Gulf of Alaska. This project milestone ties strongly into GEM's program mission to provide baseline data for a database that will be useful in monitoring and gap analysis of existing knowledge and "to sustain a healthy and biologically diverse marine ecosystem in the northern Gulf of Alaska" for us and the generations to come. We expect publications in peer-reviewed journals, such as Marine Biology, Marine Ecology Progress Series, Trends in Ecology and Evolution, Ecological Applications, Biodiversity and Conservation, and Ecological Research since within-site and between-site biodiversity comparisons have case study characteristics that are of strong interest for the local and international scientific community. These publications and reports are also likely to provide guidance to local agencies. Many transects will create local species lists that will be published locally and likely contribute to regional field guides. Specialists on each taxon will publish taxonomic papers on their particular group of organisms - both primary descriptions of new species and synthetic reviews.

It is difficult to predict the full scope of the published output of both ANaGISA and other NaGISA transects because no other project has ever dealt with biodiversity information with such fine resolution on such a wide scale. The set of standardized, fully georeferenced and high quality data from a wide range of study sites from many countries will be managed in the accessible NaGISA database (also accessible through OBIS) so that it is easily available for large-scale comparisons and for temporal comparisons as re-sampling occurs. Later, there will be comprehensive comparisons of broad geographic series (latitude vs. longitude, eastern boundaries vs. western, etc.) with joint authorship for contributors.

A major early outcome of the ANaGISA project is capacity building. Especially in Alaska, where native and other coastal communities depend heavily on marine resources through subsistence fisheries, it is important to encourage the awareness of the value of marine life and the responsibility to take charge in monitoring and conservation. The intentional "low-tech" approach of the ANaGISA sampling program provides the ideal scenario to strongly involve local communities during the anticipated two-year ANaGISA sampling but also for planned long-term monitoring projects that we expect to develop from this initial sampling. Capacity building will also be obtained through the interaction of taxonomic specialists and students involved in the project, as taxonomic knowledge is an important tool in biodiversity and monitoring studies.

ANaGISA currently has its own webpage on the University of Alaska Fairbanks School of Fisheries and Ocean Sciences website, which will be linked with the official NaGISA website as soon as it is on-line. On the ANaGISA website, we highlight community and student involvement. This ANaGISA site will be further developed to function as a window to the public to make the project more popular and to invite more scientific participation. It is likely that the scale of the project will also attract interest from the popular media, such as National

Geographic. We already had recent press releases and coverage in the Arctic Science Journeys radio. We anticipate a unique collection of photos and videos as a byproduct of the sampling process. Coffee table books for sale in museums are a possibility, and perhaps in the end there will be a paper or CD encyclopedia on the biodiversity of the shores of the world.

We will provide a quarterly report to the Trustee Council Office where we will report on the project's progress and indicate possible problems and changes that might arise. Both PI's and the graduate student working on this project intend to participate in the annual EVOS workshop to be held in Anchorage, January 2004, to present preliminary results for this project. We also plan to participate in other professional conferences to present the ANaGISA project (see section VI).

VI. PROFESSIONAL CONFERENCES

Travel support for attendance of the annual EVOS meetings in 2004 and 2005 and other professional meetings is asked for where we will present the results of our study to the scientific community.

In 2004, we would like to attend the Benthic Ecology Meeting (BEM) that will be held at Brown University, Providence, RI. This will be an ideal environment to present our results to other benthic ecologists and advertise the NaGISA sampling protocol. During the Western Society of Naturalists meeting in 2002 in Monterey, CA, we presented the NaGISA concept to many scientists working on the Pacific coast of the US. This conference helped initiate NaGISA interest from other US/Pacific researchers. During the BEM meeting we hope to interest researchers to initiate sampling of NaGISA transects along the Atlantic coast of the US.

VII. LITERATURE CITED

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Biographical Sketch

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Moss Landing Marine Laboratories, CA	Marine Sciences	M.S. 1991
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Appointments:

2000 TO PRESENT Assistant Professor. School of Fisheries and Ocean Sciences, University of Alaska Fairbanks and Staff Scientist for the West Coast and Polar Regions National Undersea Research Center.

1999 TO 2000. Research Assistant Professor, School of Fisheries and Ocean Sciences, University of Alaska Fairbanks and Staff Scientist for the West Coast and Polar Regions National Undersea Research Center.

1993 TO 1998. U.S.G.S. Biological Resources Division, Co-op Student (GS/07/04).

1991-1993. Research Assistant in McMurdo Sound, Antarctica. Moss Landing Marine Laboratories, CA. Funded by NSF (PI: John Oliver)

1991-1993. Field Research Coordinator for the California Department of Fish and Game, Bay Protection Division of the Marine Pollution Laboratories.

1990-1993. Project Coordinator for the biological assessment of the Lone Tree Landslide, CA. Moss Landing Marine Laboratories, CA. Funded by the California Department of Transportation (PI: John Oliver).

1991. Research Associate for the Elkhorn Slough Foundation.

1991. Phycologist in Resolute Bay. Funded by the Canadian Museum of Nature (PI: Cathy Conlan).

1990-1991. Oil Spill Algal Supervisor in Alaska for Coastal Resources Associates.

1990. Project Manager for the California Department of Fish and Game, Mussel Watch division of the Marine Pollution Laboratories.

1989-1990. Phycologist for Big Sur Coastline. Moss Landing Marine Laboratories, CA. Funded by the California Department of Parks and Recreation. (PI: John Oliver).

1988-1990. Phycologist for the Big Sur landslides. Moss Landing Marine Laboratories, CA. Funded by the California Department of Transportation (PI: John Oliver).

Publications:

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Dr. James Estes, University of California, Santa Cruz
Dr. Raymond Highsmith, University of Alaska Fairbanks
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Appointments:

2002-present	Assistant Professor Marine Biology (tenure track), University of Alaska Fairbanks
1999-2001	Postdoctoral Research Fellow, University of Alabama at Birmingham, USA
1996-1999	Postdoctoral Research Fellow, Alfred Wegener Institute for Polar and Marine Research (AWI), Bremerhaven, Germany
1992-1995	Graduate Student, AWI, Bremerhaven, Germany
1987-1991	Teaching assistant, University of Bayreuth, Germany

Awards:

2002 Tyge Christensen Prize for best macroalgal paper published in "Phycologia" during 2000-2001, awarded by the International Phycological Society. Award amount: $5000

Research expeditions:

Antarctic:	1992/93, 1993/94, 1998, 2000, 2001
Arctic:	1996, 2002
Deep-Sea:	1996, 1997

Scientific Diving Qualifications:

German Scientific Diving Board: Certified scientific diver since 1993
AAUS: Certified Scientific Diver since 1999

Five related publications:

Iken, K., Amsler. C.D., Greer, S.P., McClintock, J.B. (2001). Quantitative and qualitative studies of the swimming behaviour of *Hincksia irregularis* spores (Phaeophyceae): Ecological implications and parameters for quantitative swimming assays. *Phycologia*, 40, 359-366.
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Collaborators within the last four years:

Dr. Charles Amsler, Dept. of Biology, University of Alabama at Birmingham
Dr. Conxita Avila, Center for Avdanced Studies, Blanes, Spain
Dr. Bill Baker, Dept. of Chemistry, University of South Florida, Tampa
Dr. Bodil Bluhm, University of Alaska Fairbanks
Dr. Tom Brey, Alfred Wegener Institute for Polar and Marine Research, Germany
Dr. Letitia Ciavatta, Istituto per la Chimica di Molecole di Interesse Biologico, Italy
Dr. Guido Cimino, Istituto per la Chimica di Molecole di Interesse Biologico, Italy
Dr. Ken Dunton, University of Texas at Austin, Port Aransas
Dr. Angelo Fontana, Istituto per la Chimica di Molecole di Interesse Biologico, Italy
Dr. Margharita Gavagnin, Istituto per la Chimica di Molecole di Interesse Biologico, Italy
Dr. Rolf Gradinger, University of Alaska Fairbanks
Dr. Stephen Greer, Geneva College, Beaver Falls
Dr. Heike Lippert, Alfred Wegener Institute for Polar and Marine Research, Germany
Dr. James McClintock, Dept. of Biology, University of Alabama at Birmingham
Dr. Ian McDonald, Texas A&M University Corpus Christi
Dr. Gerry Plumley, University of Alaska Fairbanks
Dr. Eike Rachor, Alfred Wegener Institute for Polar and Marine Research, Germany
Dr. Karin Riemann, Alfred Wegener Institute for Polar and Marine Research, Germany
Dr. Yoshihisa Shirayama, Kyoto Marine Laboratory, Japan
Dr. Christian Wiencke, Alfred Wegener Institute for Polar and Marine Research, Germany

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

Budget Category:	Proposed FY 04	Proposed FY 05	Proposed FY 06		TOTAL PROPOSED
Personnel	$100,542.4	$0.0	$0.0		$100,542.4
Travel	$18,050.0	$0.0	$0.0		$18,050.0
Contractual	$59,864.0	$0.0	$0.0		$59,864.0
Commodities	$4,100.0	$0.0	$0.0		$4,100.0
Equipment	$0.0	$0.0	$0.0		$0.0
Subtotal	$182,556.4	$0.0	$0.0		$182,556.4
Indirect (rate will vary by proposer)	$45,635.0				$45,635.0
Project Total	$228,191.4	$0.0	$0.0		$228,191.4
Trustee Agency GA (9% of Project Total)	$20,537.2	$0.0	$0.0		$20,537.2
Total Cost	$248,728.6	$0.0	$0.0		$248,728.6

FY 04-06

Date Prepared:

Project Number:
Project Title: Alaska Natural Geography In Shore Areas: Year 2 of a Census of Marine Life Initial Field Project
Proposer: Katrin Iken, Brenda Konar

FORM 4A
NON-TRUSTEE SUMMARY

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

Personnel Costs:			Months	Monthly		Personnel
Name	Description		Budgeted	Costs	Overtime	Sum
Konar			3.0	8803.0		26,409.0
Iken			3.0	8310.0		24,930.0
Hoberg			1.0	5904.0		5,904.0
Student assistants			24.0	740.0		17,760.0
Ph.D student			8.0	1313.8		10,510.4
Ph. D (summer)			4.0	2848.3		11,393.0
Ph. D (tuition costs)						3,636.0
						0.0
						0.0
						0.0
						0.0
						0.0
		Subtotal	43.0	27919.1	0.0	
					Personnel Total	$100,542.4

Travel Costs:	Ticket	Round	Total	Daily	Travel
Description	Price	Trips	Days	Per Diem	Sum
R/T (UAF-Kodiak)-5 people	410.0	10			4,100.0
R/T (UAF-Seldovia)-5 people	470.0	5			2,350.0
R/T (UAF-Valdez)-5 people	480.0	10			4,800.0
Hotel					800.0
Meetings					6,000.0
					0.0
					0.0
					0.0
					0.0
					0.0
					0.0
					0.0
				Travel Total	$18,050.0

FY 04

Project Number:
Project Title: Alaska Natural Geography In Shore Areas: Year 2 of a Census of Marine Life Initial Field Project
Proposer: Katrin Iken, Brenda Konar

FORM 4B
Personnel
& Travel
DETAIL

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

Contractual Costs:		Contract
Description		Sum
Transportation to core sites in Kodiak (2x8 days)		$17,600
Boat charter in Prince William Sound (2x8 days)		$13,600
Lab fees Kachemak Bay (2 weeks/5 people)		
Bunks		$1,400
Lab		$2,000
Boat		$420
Pickup		$420
Food		$1,000
Shipping of gear		$1,500
Communications		$400
Macroalgae (Gayle Hansen)		$11,524
Invertebrates (Nora Foster)		$10,000
If a component of the project will be performed under contract, the 4A and 4B forms are required.	**Contractual Total**	$59,864.0
Commodities Costs:		Commodity
Description		Sum
misc lab gear for sorting and creating voucher specimens		$2,000
collecting vials for invertebrates		$1,000
pressing paper and press for algae		$300
sampling bags		$200
replacement digital camera		$600
	Commodities Total	$4,100.0

FY 04

Project Number:
Project Title: Alaska Natural Geography In Shore Areas: Year 2 of a Census of Marine Life Initial Field Project
Proposer: Katrin Iken, Brenda Konar

FORM 4B
Contractual & Commodities DETAIL

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

New Equipment Purchases:		Number	Unit	Equipment
Description		of Units	Price	Sum
				0.0
				0.0
				0.0
				0.0
				0.0
				0.0
				0.0
				0.0
				0.0
				0.0
				0.0
				0.0
			New Equipment Total	$0.0

Existing Equipment Usage:	Number	Inventory
Description	of Units	Agency

FY 04

Project Number:
Project Title: Alaska Natural Geography In Shore Areas: Year 2 of a Census of Marine Life Initial Field Project
Proposer: Katrin Iken, Brenda Konar

FORM 4B
Equipment
DETAIL

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

Personnel Costs:			Months	Monthly		Personnel
Name	Description		Budgeted	Costs	Overtime	Sum
						0.0
						0.0
						0.0
						0.0
						0.0
						0.0
						0.0
						0.0
						0.0
						0.0
						0.0
		Subtotal	0.0	0.0	0.0	
					Personnel Total	$0.0

Travel Costs:	Ticket	Round	Total	Daily	Travel
Description	Price	Trips	Days	Per Diem	Sum
					0.0
					0.0
					0.0
					0.0
					0.0
					0.0
					0.0
					0.0
					0.0
					0.0
					0.0
					0.0
				Travel Total	$0.0

FY 05

Project Number:
Project Title: Alaska Natural Geography In Shore Areas: Year 2 of a Census of Marine Life Initial Field Project
Proposer: Katrin Iken, Brenda Konar

FORM 4B
Personnel
& Travel
DETAIL

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

Contractual Costs:	Contract Sum
Description	
If a component of the project will be performed under contract, the 4A and 4B forms are required. **Contractual Total**	$0.0

Commodities Costs:	Commodity Sum
Description	
Commodities Total	$0.0

FY 05

Project Number:
Project Title: Alaska Natural Geography In Shore Areas: Year 2 of a Census of Marine Life Initial Field Project
Proposer: Katrin Iken, Brenda Konar

FORM 4B
Contractual & Commodities DETAIL

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

New Equipment Purchases:		Number	Unit	Equipment
Description		of Units	Price	Sum
				0.0
				0.0
				0.0
				0.0
				0.0
				0.0
				0.0
				0.0
				0.0
				0.0
				0.0
				0.0
			New Equipment Total	$0.0

Existing Equipment Usage:	Number	Inventory
Description	of Units	Agency

FY 05

Project Number:
Project Title: Alaska Natural Geography In Shore Areas: Year 2 of a Census of Marine Life Initial Field Project
Proposer: Katrin Iken, Brenda Konar

FORM 4B
Equipment
DETAIL

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

Personnel Costs:			Months	Monthly		Personnel
Name	Description		Budgeted	Costs	Overtime	Sum
						0.0
						0.0
						0.0
						0.0
						0.0
						0.0
						0.0
						0.0
						0.0
						0.0
						0.0
		Subtotal	0.0	0.0	0.0	
					Personnel Total	$0.0

Travel Costs:	Ticket	Round	Total	Daily	Travel
Description	Price	Trips	Days	Per Diem	Sum
					0.0
					0.0
					0.0
					0.0
					0.0
					0.0
					0.0
					0.0
					0.0
					0.0
					0.0
				Travel Total	$0.0

FY 06

Project Number:
Project Title: Alaska Natural Geography In Shore Areas: Year 2 of a Census of Marine Life Initial Field Project
Proposer: Katrin Iken, Brenda Konar

FORM 4B
Personnel
& Travel
DETAIL

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

Contractual Costs:	Contract Sum
Description	
Contractual Total	$0.0

Commodities Costs:	Commodity Sum
Description	
Commodities Total	$0.0

FY 06

Project Number:
Project Title: Alaska Natural Geography In Shore Areas: Year 2 of a Census of Marine Life Initial Field Project
Proposer: Katrin Iken, Brenda Konar

FORM 4B
Contractual & Commodities DETAIL

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

New Equipment Purchases:		Number	Unit	Equipment
Description		of Units	Price	Sum
				0.0
				0.0
				0.0
				0.0
				0.0
				0.0
				0.0
				0.0
				0.0
				0.0
				0.0
				0.0
			New Equipment Total	$0.0

Existing Equipment Usage:	Number	Inventory
Description	of Units	Agency

FY 06

Project Number:
Project Title: Alaska Natural Geography In Shore Areas: Year 2 of a Census of Marine Life Initial Field Project
Proposer: Katrin Iken, Brenda Konar

FORM 4B
Equipment
DETAIL

BUDGET JUSTIFICATION

a. Principal Investigators (PIs)

Brenda Konar
School of Fisheries and Ocean Sciences
University of Alaska Fairbanks
Fairbanks Alaska 99775-7220
bkonar@ims.uaf.edu
office 907-474-5028
fax 907-474-5804 Konar requests 3 months ($26,407)

Katrin Iken
School of Fisheries and Ocean Sciences
University of Alaska Fairbanks
Fairbanks Alaska 99775-7220
iken@ims.uaf.edu
office 907-474-5192 Iken requests 3 months ($24,928)

b. Other Key Personnel

We request the 2nd year of funding for a graduate student who is involved in the ANaGISA project. ANaGISA is an ideal PhD framework in providing a concise sampling program, interaction with local scientists, agencies and local communities and the potential interaction on an international level. Gayle Neufeld has started her PhD work with GEM funding in January 2003. She is involved with the sampling and in establishing contacts with local communities. She also is expanding the ANaGISA scope by investigating small-scale influences of grazers on biodiversity along the same depth strata as the ANaGISA sampling. The committed involvement of this graduate student will further ensure continuity and capacity building. Salary, plus two semesters resident tuition costs, is $25,539.

We are also seeking funds for student sorters. Their primary responsibility will be to sort through the destructive samples and help construct the voucher collection. This work will provide valuable experience for undergraduate students. Sorters will cost $17,748.

c. Contracts

We are contracting taxonomic experts in macroalgae and invertebrates. Although both PI's are familiar with the local fauna and flora, taxonomic experts are necessary for quality insurance of species identification as well as to participate in capacity building. As macroalgal specialist we have acquired Gayle Hanson (Hatfield Marine Science Center, Oregon) who is a proven expert on the macroalgal flora in the Gulf of Alaska region. Nora Foster and Max Hoberg (both UAF) are invertebrate specialists with many years of experience in identifying species from the Gulf of Alaska. Hansen cost is $11,524; Foster cost is $10,000; Hoberg cost is $5,904

d. Travel

Travel costs include round trip travel from Fairbanks to Kodiak, Fairbanks to Seldovia, Fairbanks to Valdez, plus hotel and meetings for a total of $18,050.

e. Services

Service costs include lab fees at Kachemak bay for two weeks for 5 people, boat charter in Prince William Sound (2 x 8 days/$850 day), transportation to core sites in Kodiak (2 X 8 days/$1100 day), shipping of gear and needed communications costs. Total is $38,340.

f. Supplies

Project supplies include lab gear for sorting and creating voucher specimens ($2000), collecting vials for invertebrates ($1000), pressing paper and press for algae ($300), sampling bags ($200), and a replacement video camera ($600).

PRINCIPAL INVESTIGATOR QUALIFICATIONS

Both PI's (Brenda Konar and Katrin Iken) hold positions as Assistant Professors in Marine Biology at the University of Alaska Fairbanks. Both have extensive experience in near-shore ecological work that is documented in a list of peer-reviewed publications (see CV's). Konar and Iken are both knowledgeable cold-water SCUBA divers with years of experience in designing valuable sampling programs, collecting and handling samples, and performing scientific work in a timely manner. The experience of both PI's in working on shallow-water and intertidal community level as well as on an organismal level with macroalgae and invertebrates provides the background necessary for the proposed project. Both PIs have successfully organized and participated in the ANaGISA sampling in the Gulf of Alaska during 2003 (1st year funding).