



Broadening our understanding of the North Pacific  
nearshore ecosystem:

# Integrating PICES and NaGISAP



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## Natural Geography In Shore Areas

nagisa is the Japanese word for the area where the ocean meets the shore, it implies the whole shore ecosystem



## Mission Statement

***To discover, describe and record the biodiversity of the worlds costal zones and the changes in it over time***

Discover the Worlds Near Shore



# Project Description

- A collaborative initiative aimed at establishing an initial baseline of biodiversity in the near shore
- Promoting wide-scale, standardized sampling
- To highlight patterns and changes in biodiversity of the world's coast
- Dedicated to involving local researchers and communities
- To create a capable foundation for long-term coastal monitoring programs



# Implementation: Building on existing networks *ex. in the North Pacific*



DIVERSITAS international program of biodiversity science



International Biodiversity Observation Year

GTI  
JAPAN

Global Taxonomic Initiative (GTI)



Gulf of Alaska Environmental Monitoring Program (EVOS-GEM)



Japan Society for the Promotion of Science (JSPS)



Field Science Education and Research Centers (FSERC)



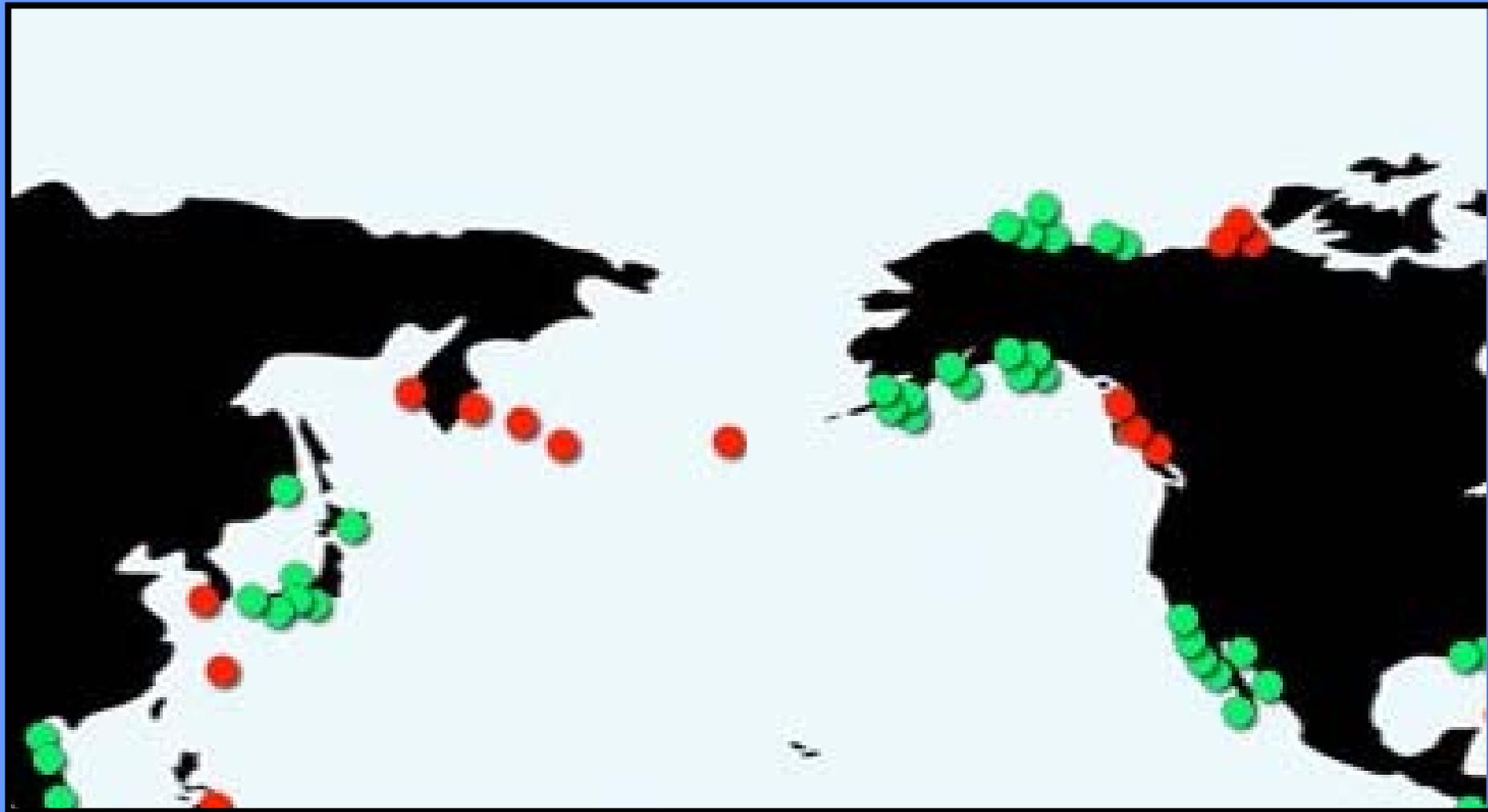
North Pacific Marine Science Organization (PICES)

PICES





# NaGISA in the North Pacific



# Habitats

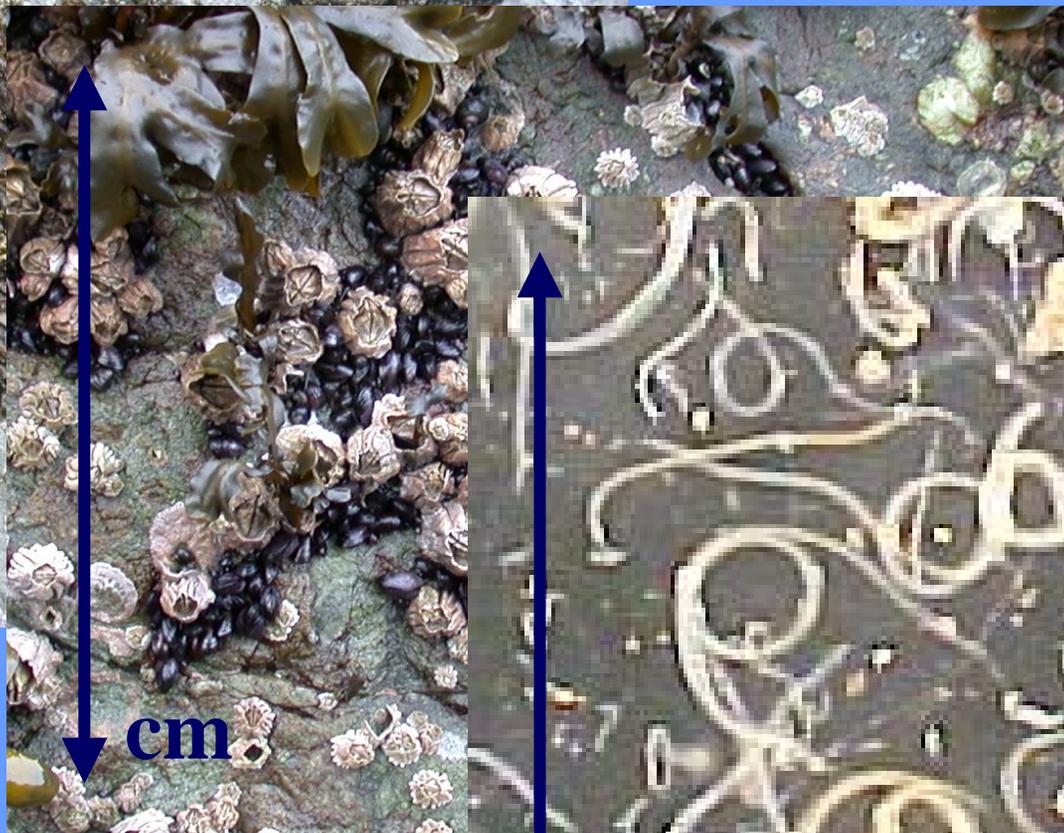
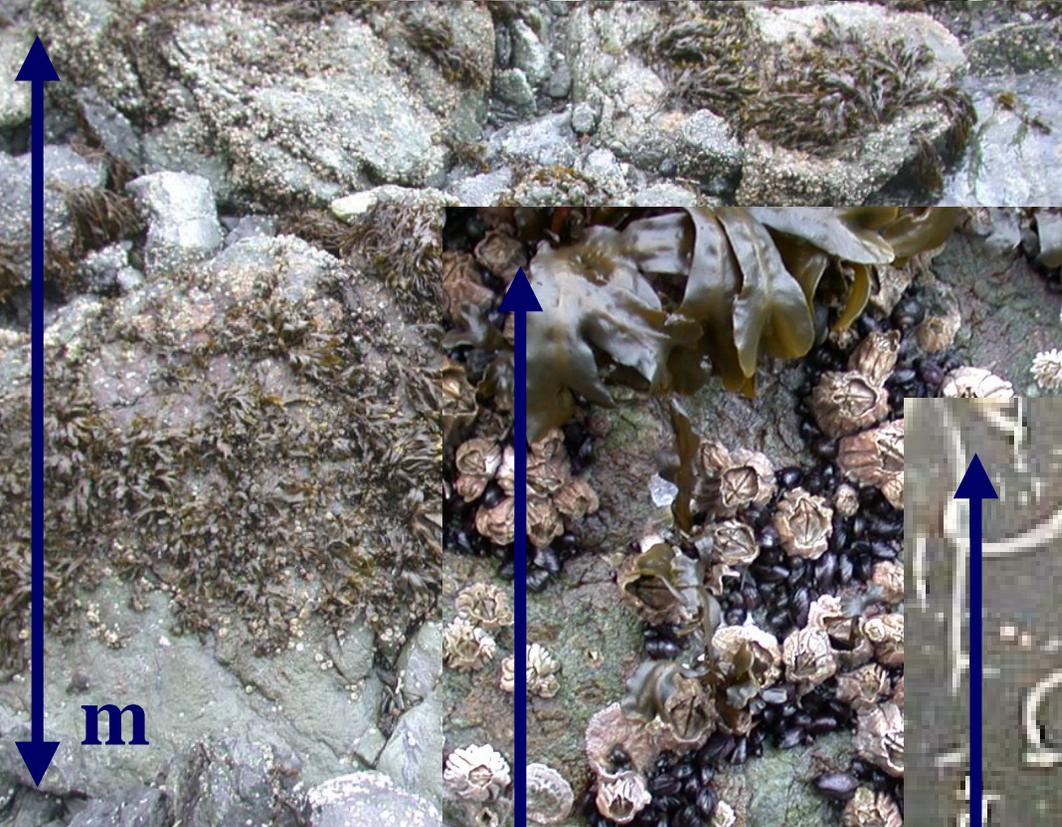
Two habitats were chosen due to their wide distribution and naturally high biodiversity

Macroalgae Rocky Shore

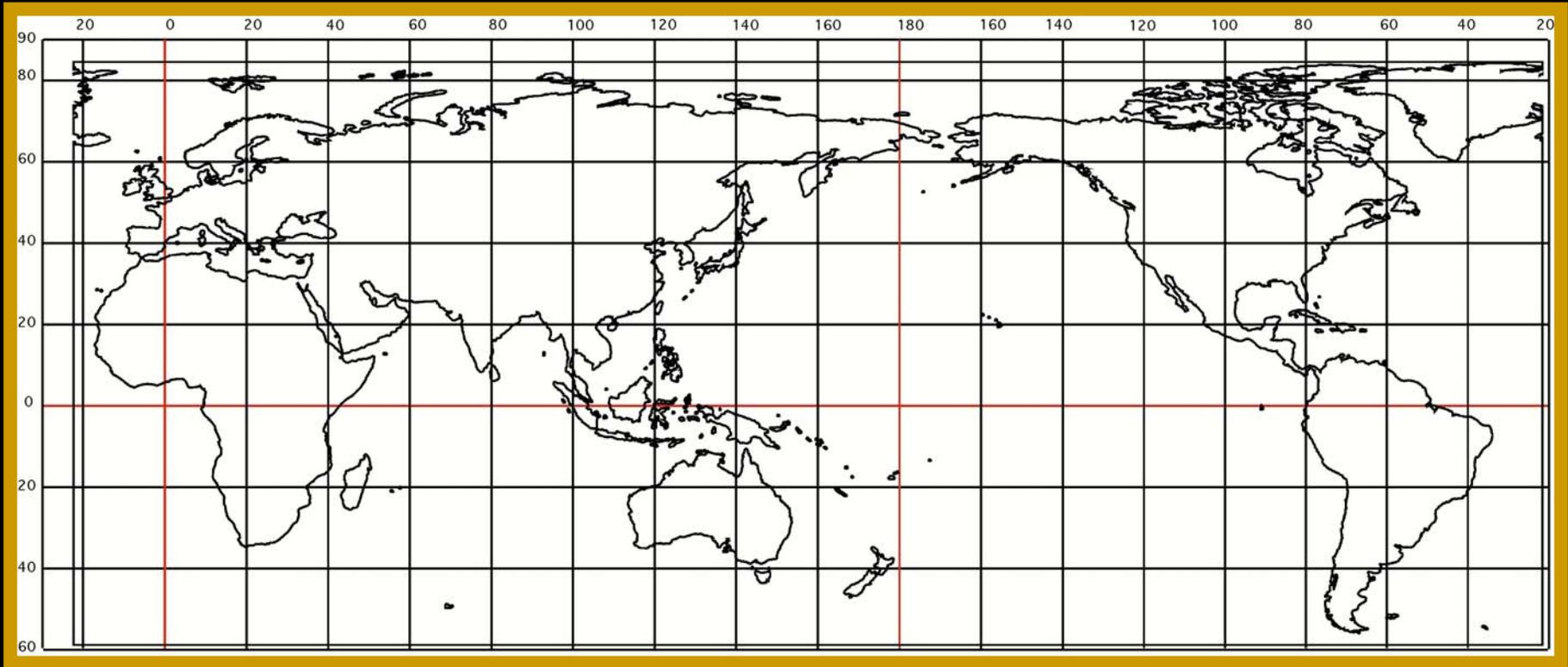
Seagrass Beds



# Standard Protocols



# The world's ocean shorelines



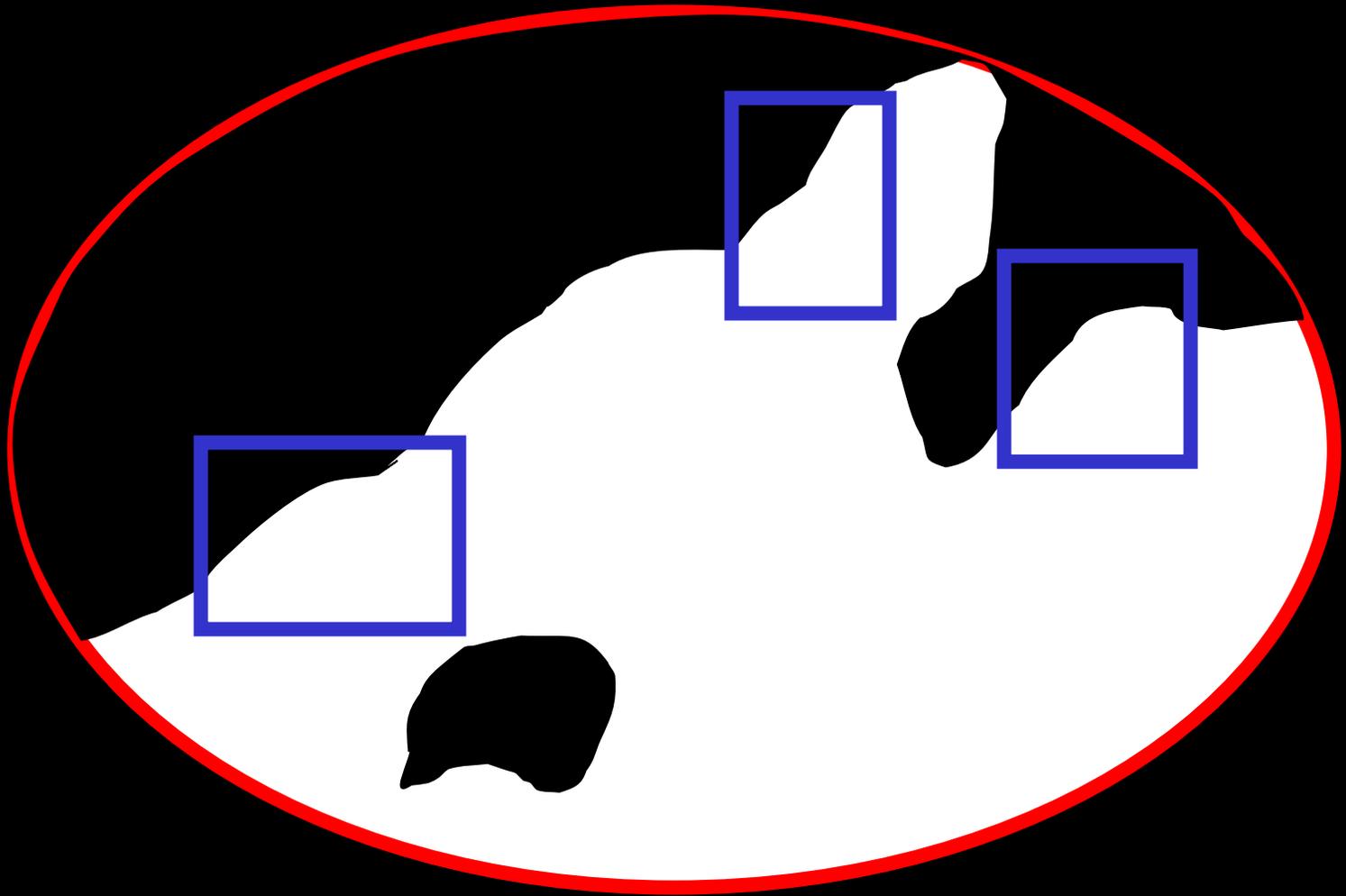
are divided in to boxes of 20° longitude and latitude

**Within each box at least 3 AREAS are chosen**

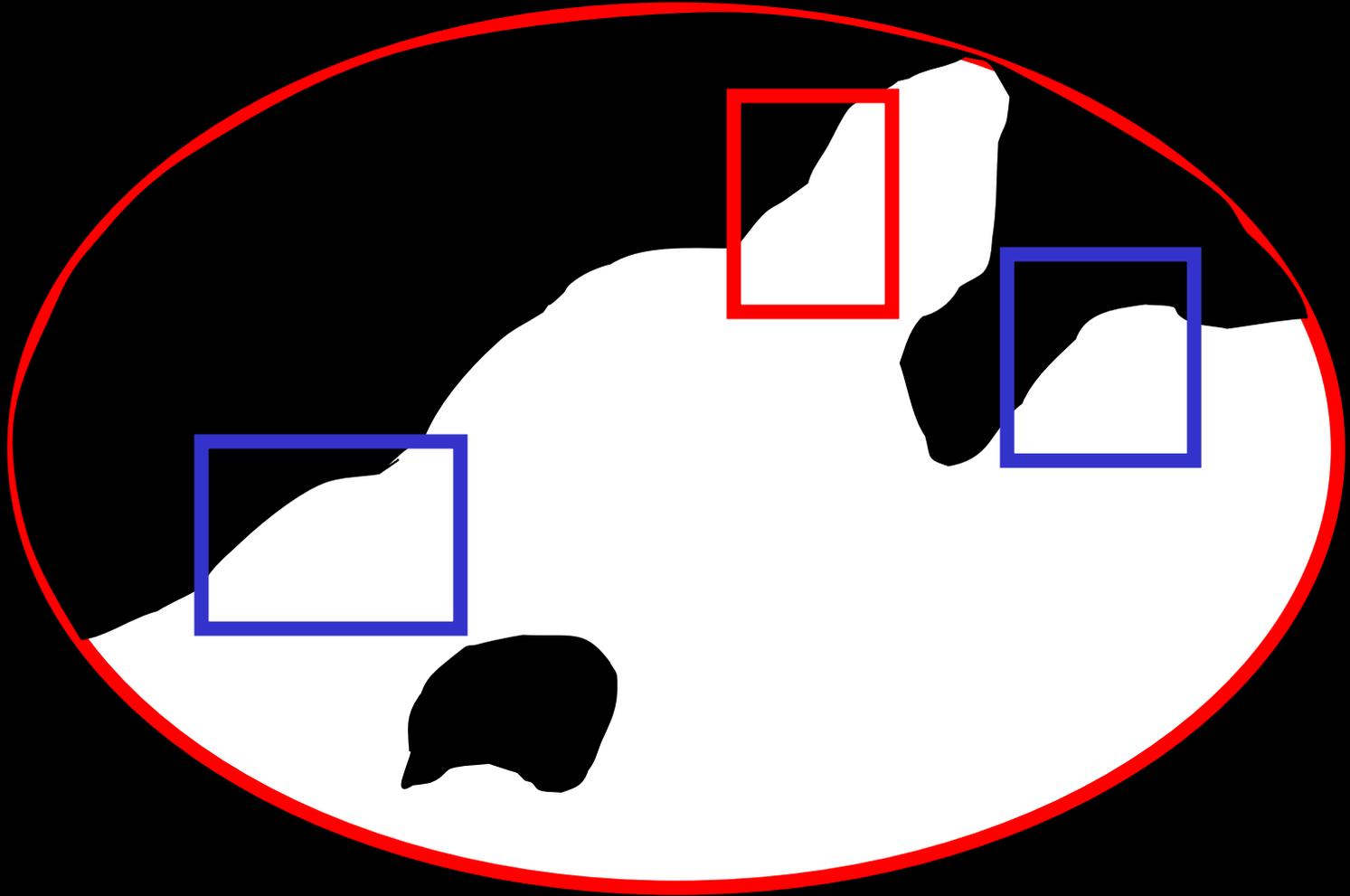


**An area is a distinct geographic region the 3 areas are chosen in reference to each other so that they combine to represent the maximum biodiversity found within the 20° box**

**Within each area at least 3 SITES are selected...**

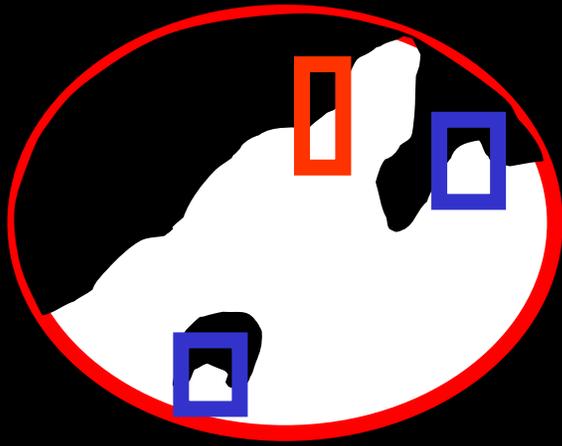


# 1 core site and 2 satellite sites



**The satellite sites will be done at least once before 2008**

**The core site will be repeated\* for the next 50 years**



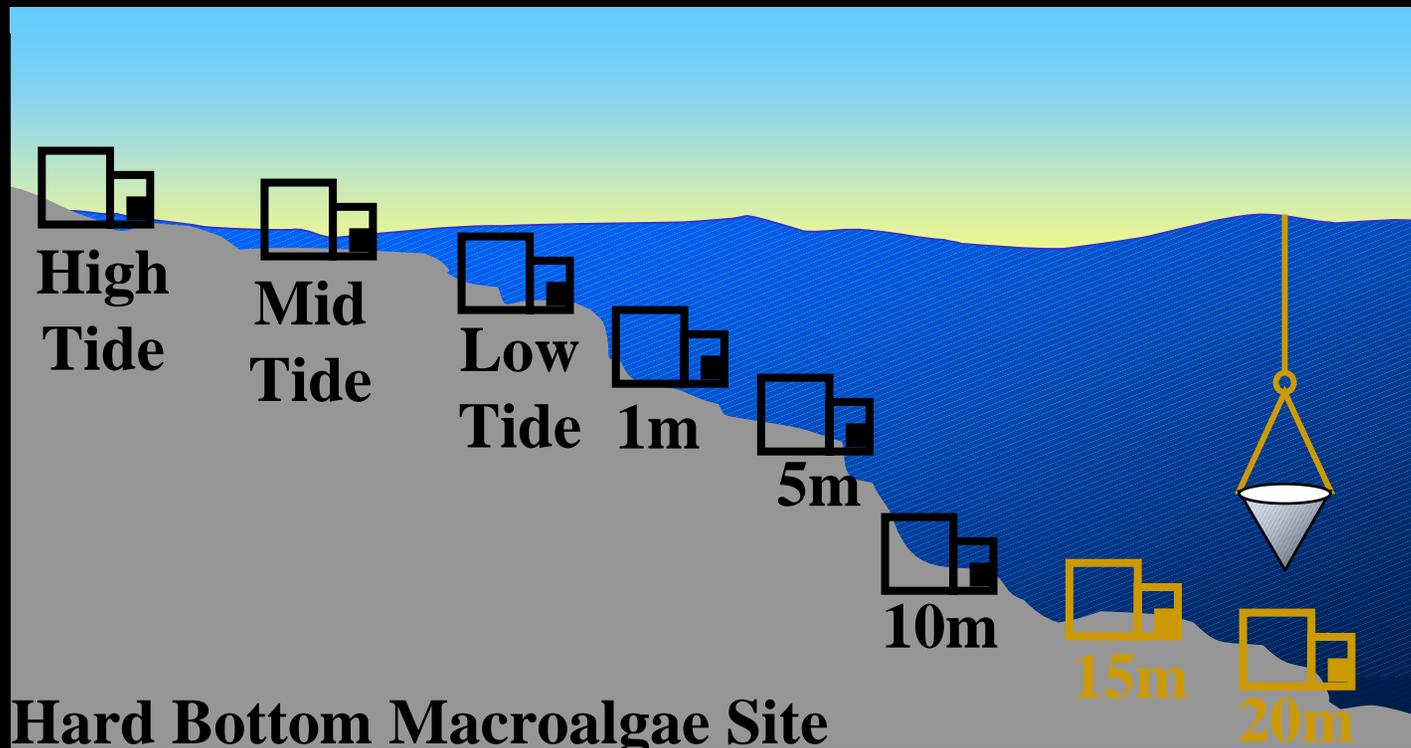
A site is a distinct local ranging from 30 to 75m hosting a continuous habitat. The three sites must be separate and distinct

## Sites are chosen based whether they are:

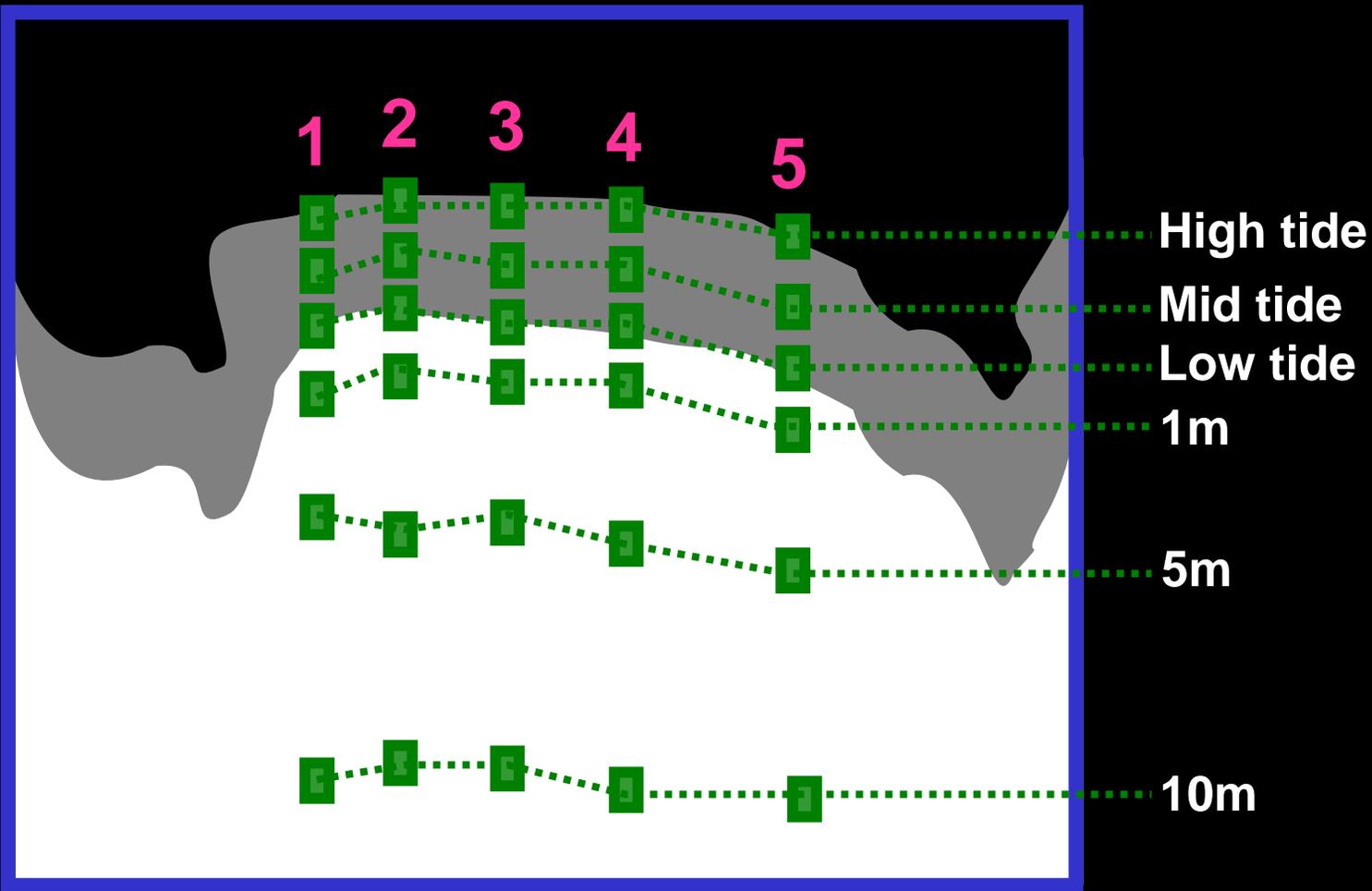
- Pristine (relatively undamaged)
- Continuous (extend beyond the transects)
- Stable (over the foreseeable future)
- Accessible (by your mode of transport)
- Related to historic sampling areas or local communities (to assist with long term sampling)

**Quadrates sets are done at the first 6 heights, surface and bottom temperature are recorded**

**Option: Quadrates sets at 15m, 20m, plankton pulls, salinity and light measurements**



**5 replicates** of each sampling height are made



# Macroalgae Sampling

each quadrate is digitally photograph



Percentage coverage  
or individual number  
of visible (>2cm) species

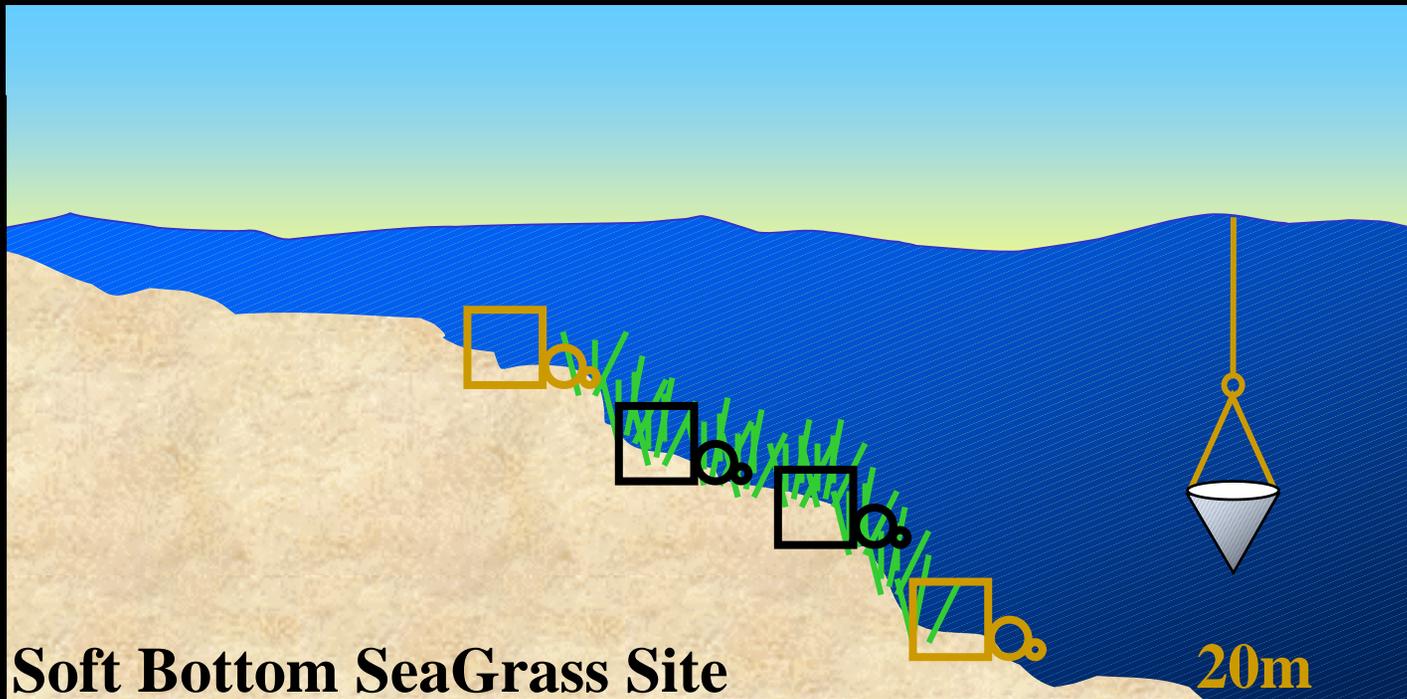
Everything

All macroalgae

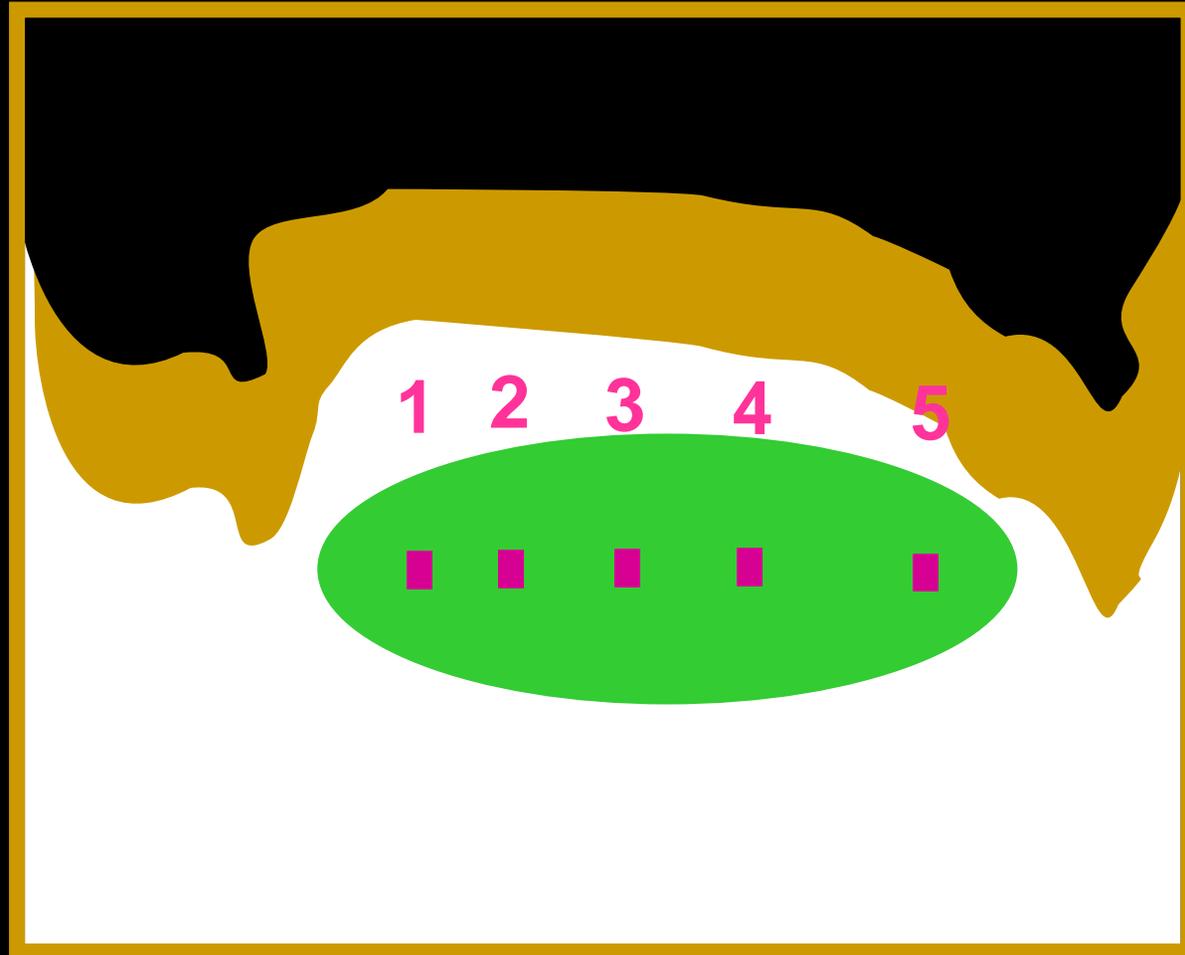


**Quadrate sets are done inside the seagrass bed, surface and bottom temperature are recorded**

**Option: Quadrate sets at the edge or outside of the bed, plankton pulls, salinity and light measurements**



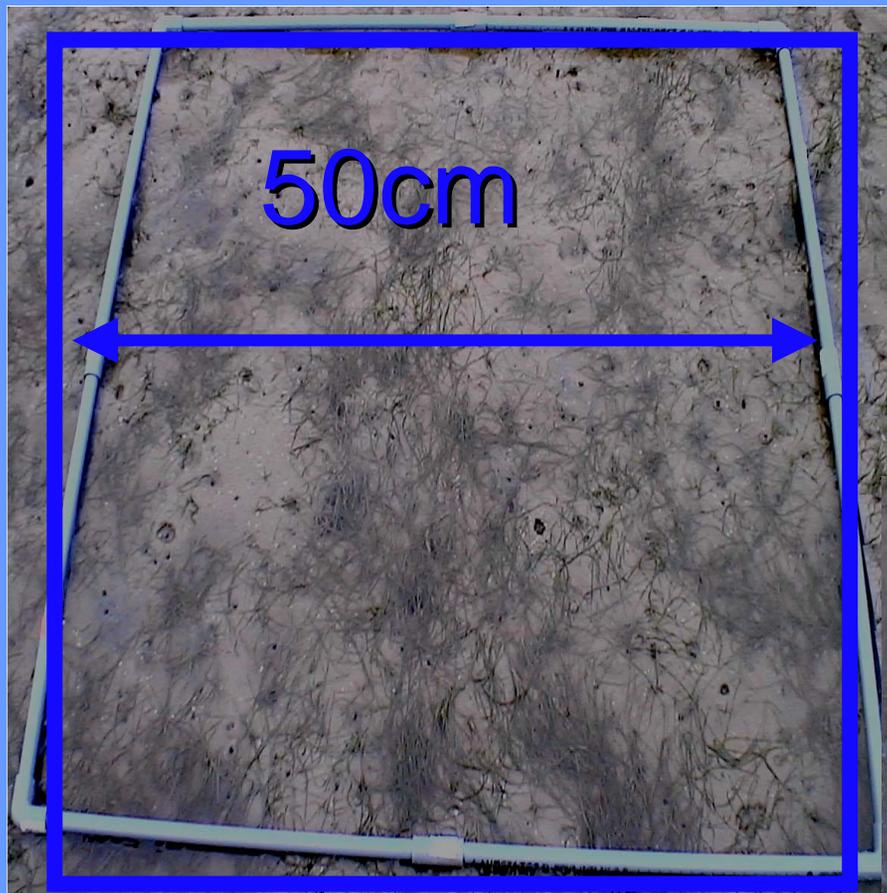
**5 replicates** in the middle of the seagrass bed



# Seagrass Sampling

quadrates is digitally photographed

Count the number of shoots  
underwater (option)



15cm core 10cm deep  
for Macrophytes and  
Macrofauna

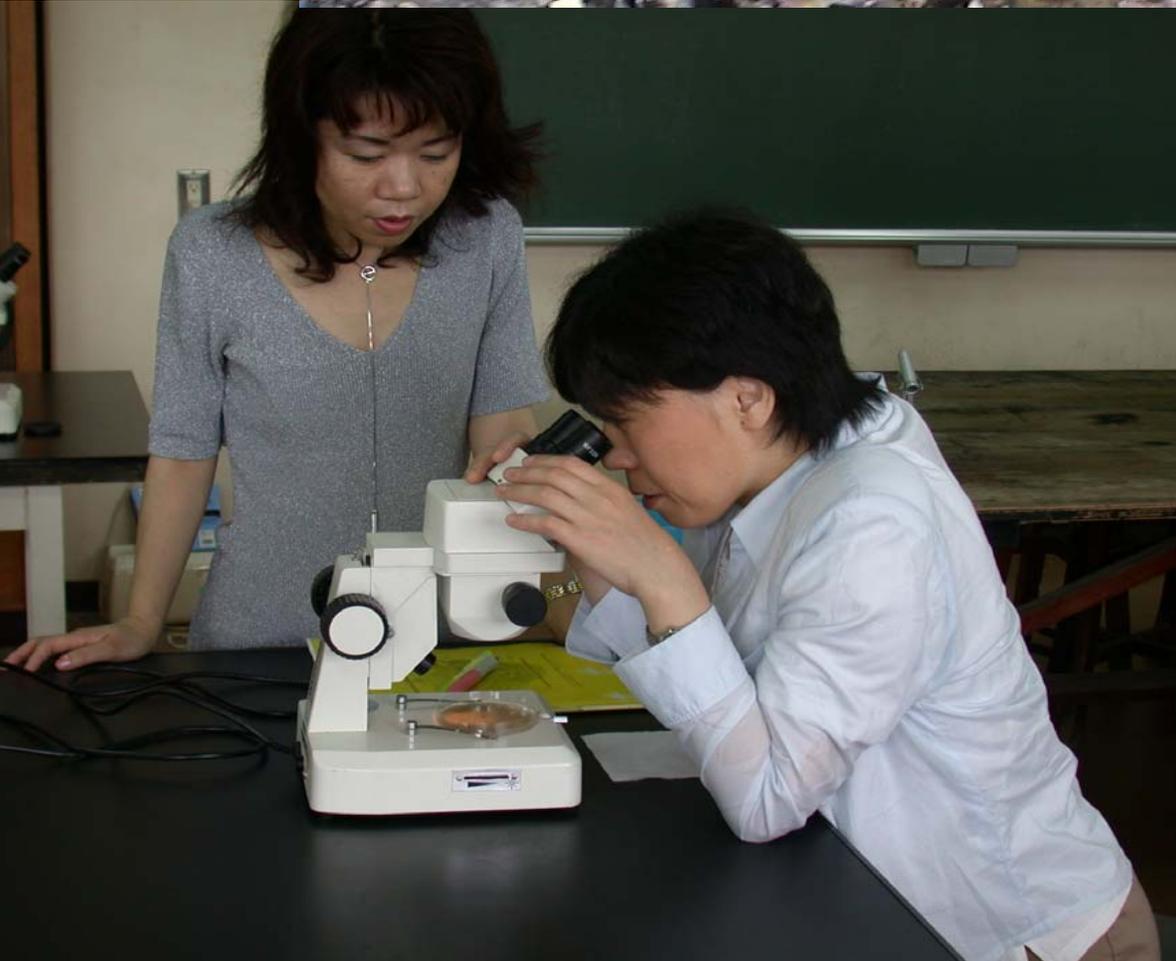


2cm core  
10cm deep for  
Meiofauna

2cm



# Education and Capacity Building



**NaGISA Workshop**  
**Taxonomy of Echinodermata**

1 - 3 March 2005  
Seto Marine Biological  
Laboratory, Field Science  
Education and  
Research Center,  
Kyoto  
University  
Japan

*Marine Biologists*  
You are invited to learn  
about the taxonomy of  
Echinodermata, and  
practical techniques for  
sampling, fixing and  
identifying them in a 3  
day hands-on course in  
Shirahama Japan

**Supervisors**  
**Dr. Toshihiko Fujita**  
National Science  
Museum, Tokyo, Japan  
**Mr. Masaki Saba**  
Japanese Society of  
Systematic Zoology

Travel support  
is available for  
NaGISA participants  
(current and future),  
especially for young  
scientists and  
graduate  
students

Registration  
Forms & Details  
on the web at:  
[www.nagisa.com.org](http://www.nagisa.com.org)  
or e-mail us at  
[echinoderms@seto.kyoto-u.ac.jp](mailto:echinoderms@seto.kyoto-u.ac.jp)

A large, stylized illustration of a starfish, colored in shades of blue and green, positioned vertically in the center of the flyer.A row of logos at the bottom of the flyer, including the CENSUS OF MARINE LIFE logo, the Kyoto University logo, the NaGISA logo, and a green wave logo.

Classes, workshops and exchange programs for Students and Researchers focused on taxonomy

# Education and Research



Students learn identification techniques from traveling taxonomists (aka Taxonomic Caravan)



# Education and Community Involvement

Youth Watch Kodiak USA



Tanabe High School Biology Club



Public Field Courses



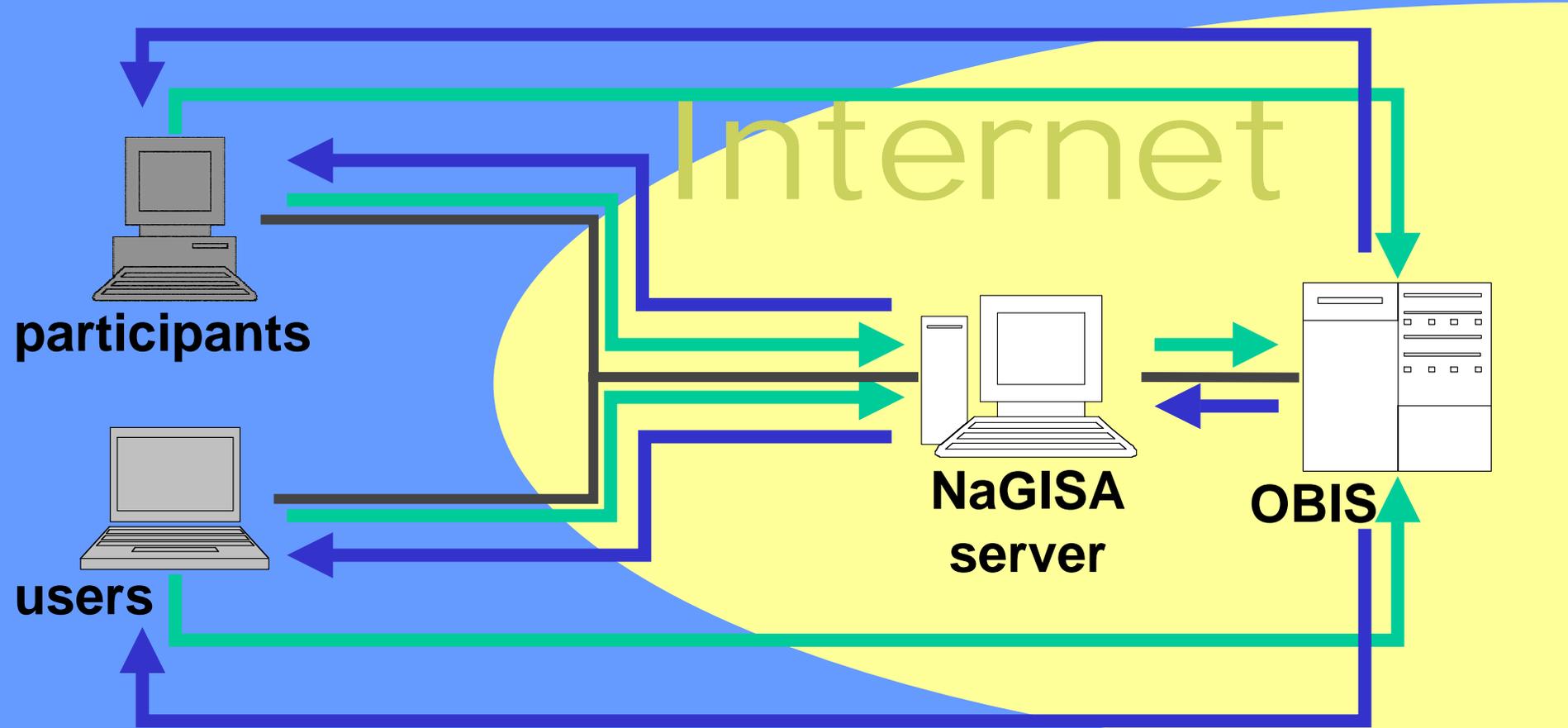
The Boys and Girls Club Native (Arctic) communities



Fulbright Memorial Fund Exchange

# Work Locally Study Globally

Data becomes available for research, education and decision making around the world



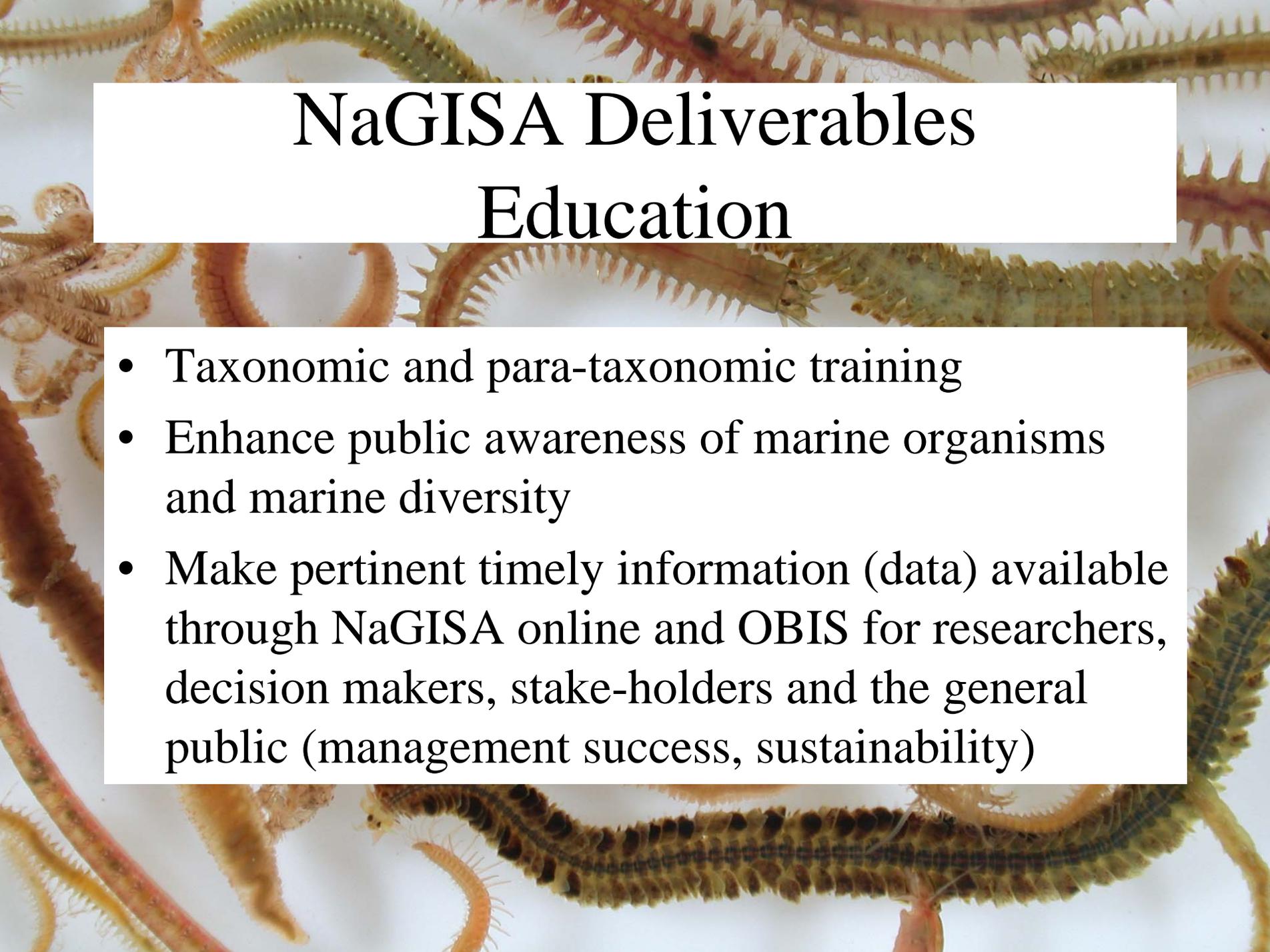
# Database

- `Map` able data in a hierarchal database
- Cross referenced with physical ocean data (salinity, light, temperature, sediment/bottom type...)
- Currently developing tools to match researchers requirements

# NaGISA Deliverables

## Scientific

- Provide basic information: a global pattern of biodiversity based on comparable data
- The frame work for a long term monitoring program for biodiversity (invasive species)
- Enhance global taxonomic studies
- Accelerate the study of Meiofauna



# NaGISA Deliverables

## Education

- Taxonomic and para-taxonomic training
- Enhance public awareness of marine organisms and marine diversity
- Make pertinent timely information (data) available through NaGISA online and OBIS for researchers, decision makers, stake-holders and the general public (management success, sustainability)

# Collaboration with PICES

- PICES members become NaGISA participants- *individual scientists & institutions*
- Data exchange for the greater understanding of the NP- *cooperative research teams*
- Joint seminars, workshops and encouragement of local participation through out the NP – *project level interaction*

[www.nagisa.coml.org](http://www.nagisa.coml.org)

e-mail: [nagisaonline@yahoo.com](mailto:nagisaonline@yahoo.com)

## **List of Comments**

### Slide 1

I would like to start by saying thank you to PICES for inviting NaGISA on behalf of myself Robin Rigby, my co authors who cannot be with me today Tetsuya Kato and Yoshihisa Shirayama as well everyone I represent meaning the members and participants of NaGISA.

In the next 20 min I am going to try and sketch an outline of the NaGISA project thus (hopefully) laying out a foundation for PICES and NaGISA interaction most specifically in our common initiatives which are maybe best summed by the title you see here `broadening the current understanding of the North Pacific Nearshore ecosystem`.

### Slide 2

As all introductions should start with a name let me introduce NaGISA. An acronym for the Natural Geography In shore Areas Project it may be familiar to many in the audience as it is the the Japanese word for the complex system formed between the ocean and the land.

### Slide 3

Our mission statement – headlined by the catch phrase that encourages everyone to `Discover the Worlds Near Shore` is TO DISCOVER, DESCRIBE AND RECORD THE BIODIVERSITY OF THE WORLDS COASTAL ZONES AND THE CHANGES IN IT OVER TIME.

### Slide 4

NaGISA emphasizes wide-scale, standardized sampling in seasons of maximum diversity in areas of minimum human impact to establish an initial near shore baseline of biodiversity. Conducting this international nearshore census will highlight patterns that will provide information for future comparisons and allow the scale of variability to be identified. The capable network of resources and researchers built up during this effort will compliment the information and secure the prospects of long-term coastal monitoring programs. This can be described but the five points outlined here – read screen

## Slide 5

The implementation of NaGISA has been different in every country. However there is one clear similarity: the fact that we have made ample use of the systems already in place. On the screen I have put but a few of the networks that we have benefited from within the North Pacific starting with Diversitas an international program initiated for biodiversity science which declared 2001 to be the international Biodiversity observation year where scientists gathered to figure out what was known and what needed to be done in biodiversity science on a Global scale. It was here that the possibility of a global nearshore census was first broached. Global Taxonomic Initiative is an outcome of the Convention on Biological Diversity and was organized in part as a response to the shortage of taxonomic information, expertise and resources that hinder implementation of the convention in the Asian region. The next is JSPS, which we have partnered with for many initiatives including much of our work in the Western Pacific. I have put the FSERC here as an example of one of the main local and national networks NaGISA attempts to draw in to collaboration. In the case with FSERC we have used some of its 12 research stations as bases for NaGISA sites as well as places to hold public and educational workshops and classes. By using the networks in place NaGISA can grow stronger and faster than it could by forging its own way. It is our hope that we will be able to partner with PICES members and well as the PICES project in order to truly fill out our Northern Pacific Portfolio.

## Slide 6

It is through our connections with established networks that we have been able to grow as fast as we have. The map shown here is the latest pictorial view of the countries involved— we currently have 5 Research administration centers organized under the HQ in my home university of Kyoto – the yellow boxes show areas where we have dedicated groups working in the field and the blue boxes show areas where we have made contacts and are waiting for confirmation that they are in the water.

## Slide 7

Greater detail of course is seen by looking at exactly where our sites are... and as this is after all PICES I will go directly to the North Pacific – Green dots are where we have sites – many of them which have been sampled annually since 2002. The red dots are sites that we are hoping will start delivering data in 2006

## Slide 8

Each of those dots was within one of our two chosen habitats macroalgae or seagrass chosen for their global distribution, the lack of current knowledge and the scale of diversity that is found in both. Although NaGISA is committed to detailing these two habitats many of our researchers have co sites in Sandy or muddy areas, Rhodolith beds,

coral reefs and mangroves (depending on where they are) and NaGISA handles this by having similarly standardized protocols and database entry for these habitats as well but does not promote them as they are not found globally and are thus part of local NaGISA initiatives.

#### Slide 9

Biodiversity is too often studied at one level, NaGISA is attempting to create a nearshore baseline that will highlight patterns in biodiversity and identify the scale of variability needed to do this thus we have established standardized protocols that take in to account variability between Latitudes, longitudes, kilometers, meters centimeters and millimeters.

#### Slide 10

To do this we have divided the world into 20 degree boxes of Longitude and latitude

#### Slide 13

One of these is a core site that will be sampled at least every five years for as long as possible and the other two are satellite sites to be done to flush out the baseline information before 2008

#### Slide 17

\*In the 50cm quadrat all the macroalgae over 1g in total wet weight is taken. The hard macroalgae does not need to be scraped at this point as it will be collected in the 25cm and recorded in the 1m.

#### Slide 21

Education and Capacity building which means we are heavily involved in putting on Classes, WS and Exchange programs for Students and researchers focused mainly on taxonomy. The photo is of an undergraduate class held in our laboratory for meiofauna identification and the poster is from one of our taxonomy workshops – this one put on in Japan – we have at least 2 every year in fact one dealing with Crustaceans just finished in Indonesia last month and the next spring we will have one on Mollusks in Venezuela (February) and on Macro Algae in BC (March) and field methods in Kenya (April)

## Slide 22

Although Classes and workshops are great for introductions to new taxa and practices sometimes more is needed and this is where our Taxonomy Caravan comes into play- taxonomists visit local research stations and work with researchers and students for much longer more intense periods of time than are possible in limited WS.

## Slide 23

The obvious continuation of education is to those outside the university environment and what initially started as an attempt to encourage interest in ocean and marine science as become one of the most vital parts of our propagation in to a sustainable monitoring program. Many of the community groups and even high schools that we have worked with have taken on the managing of whole sites or become the extra hands needed to sample distant shores.

## Slide 24

And although field work is wonderful it must be turned in to data and for a global census to work it must be amalgamated in to one place which is what we do on the NaGISA server- individual participants upload there data which can then be downloaded along with all the other participants information via NaGISA Online or through OBIS the census database portal. Allowing researchers to Work Locally and Study Globally