10 years inventorying marine species diversity in remote coral reefs of the Campeche Bank, Yucatan, Gulf of Mexico

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UMDI-Sisal, Fac. Ciencias, UNAM

Mexico

UNIDAD ACADÉMICA YUCATÁN

BDMY BioDiversidad Marina de Yucatán

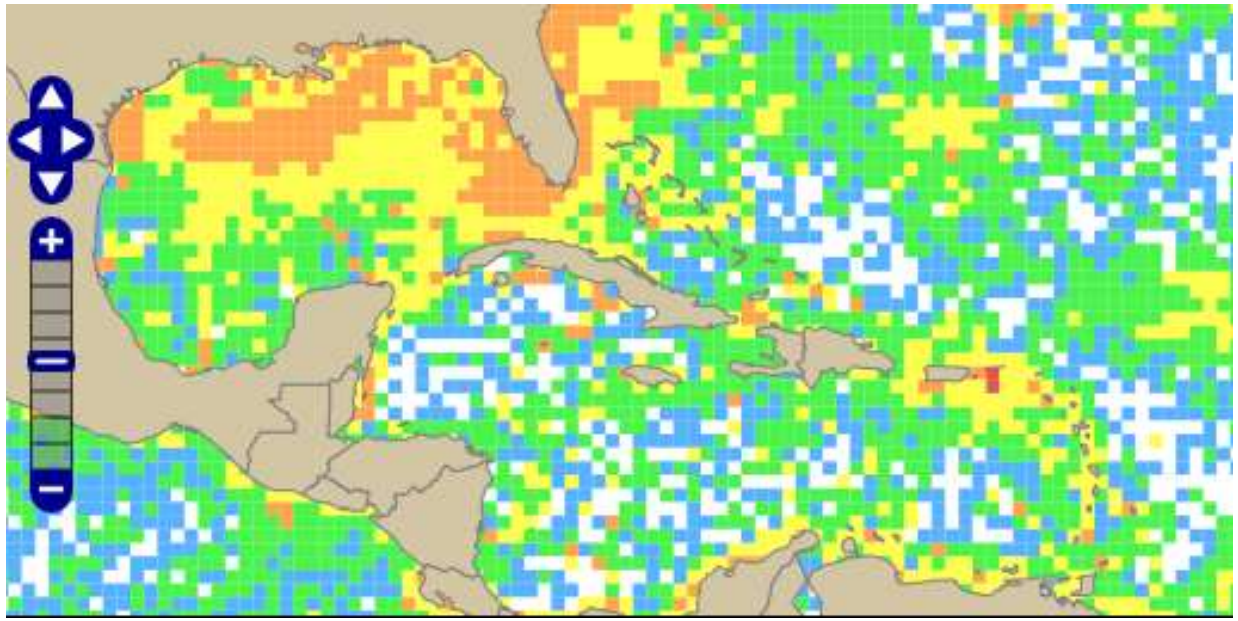
TEXAS A&M UNIVERSITY CORPUS CHRISTI | HARTE RESEARCH INSTITUTE FOR GULF OF MEXICO STUDIES

CONABIO

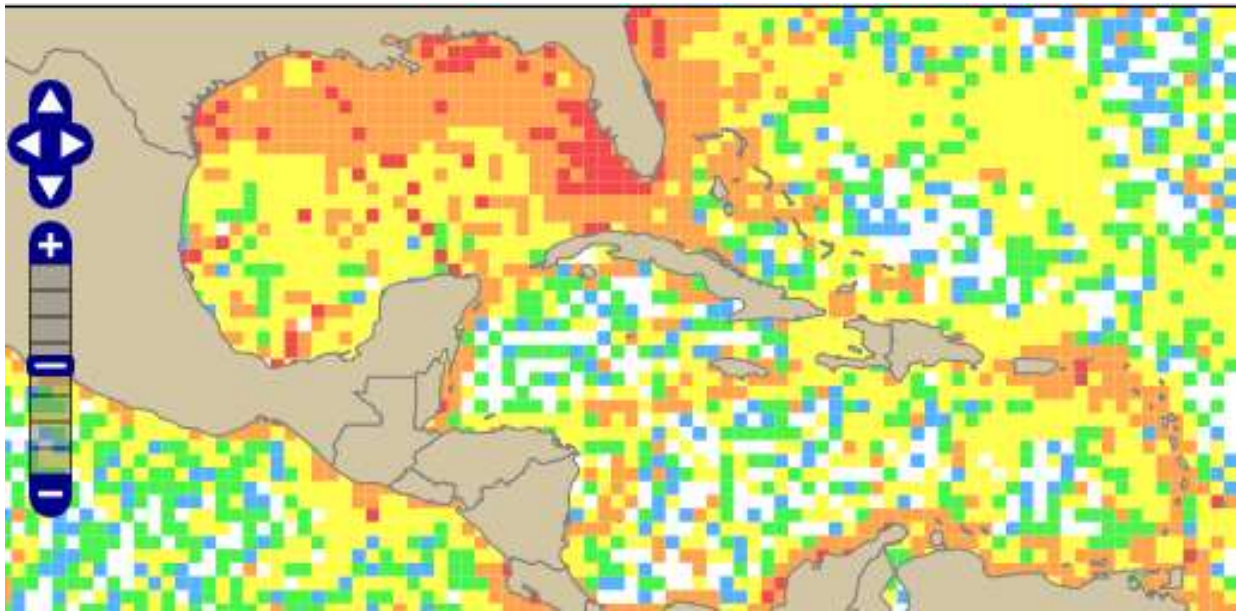
Sustained coastal and ocean observing systems in Mexico?

- first step is to know what to observe
- Mexico is a biodiverse country = many species
- CONABIO – biodiversity knowledge Mexican agency
- A lot is already described, but...
- Bias for terrestrial environments
- Several taxa are under-represented (invertebrates)
- 2008 a project started to increase our knowledge on the southern Gulf of Mexico marine species

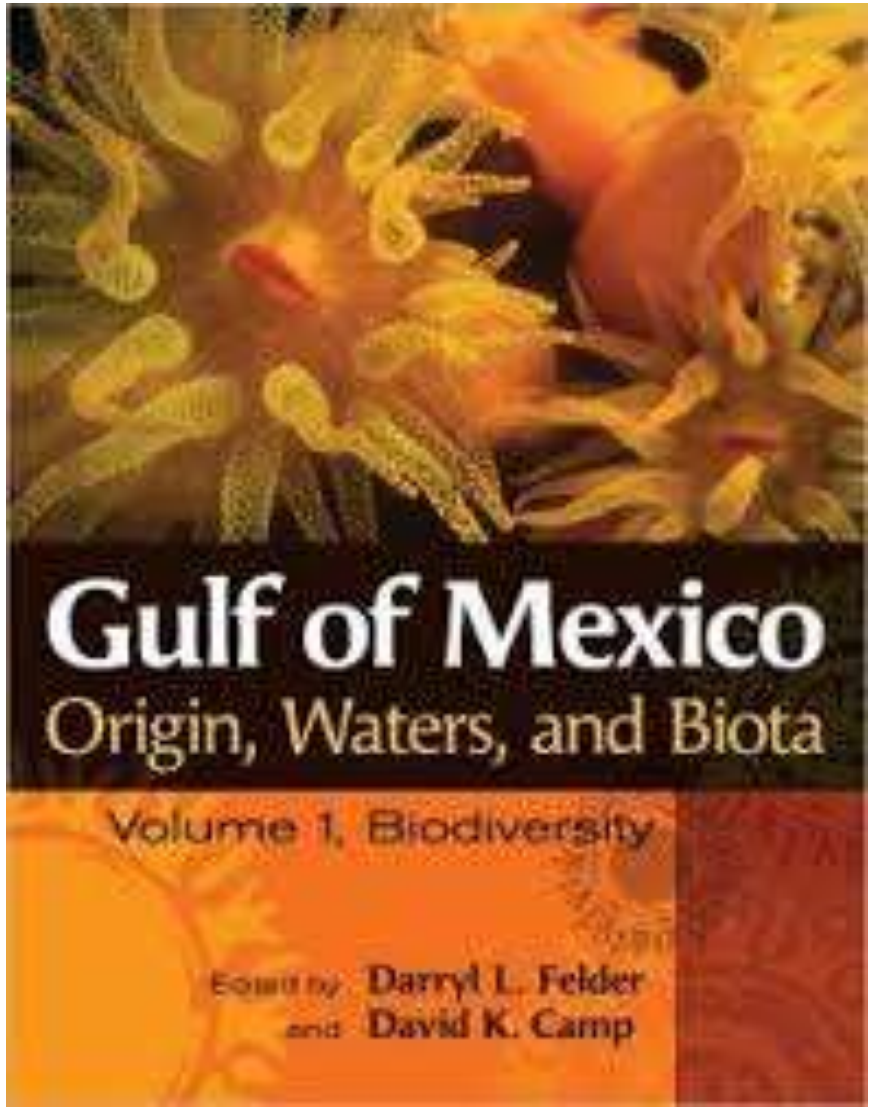
records



species

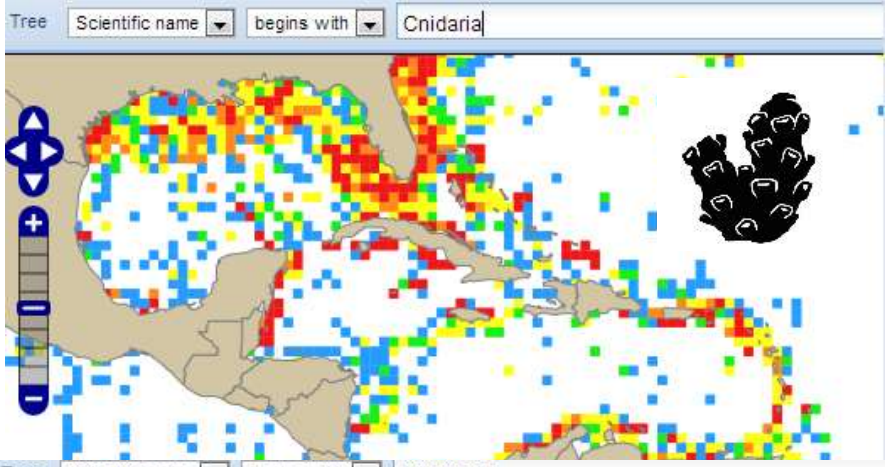


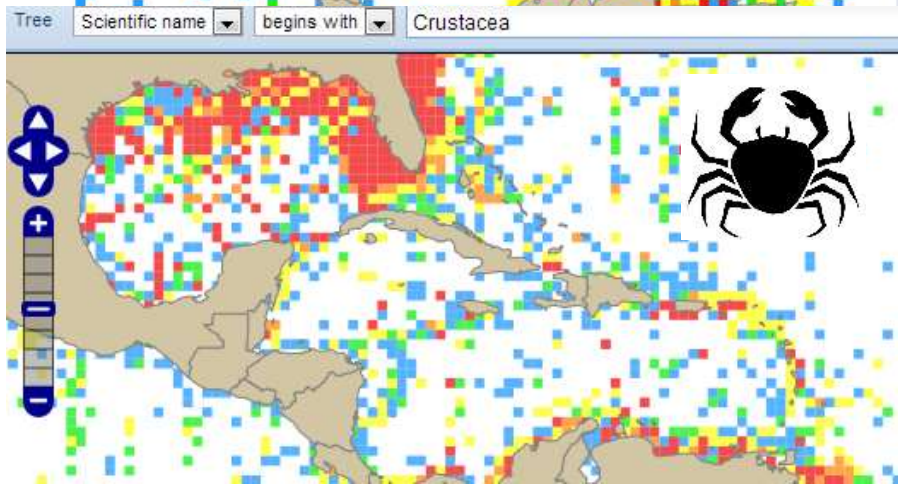
Intergovernmental Oceanographic Commission (IOC) of UNESCO. The Ocean Biogeographic Information System. http://www.iobis.org. (Consulted on 08/10/2013)

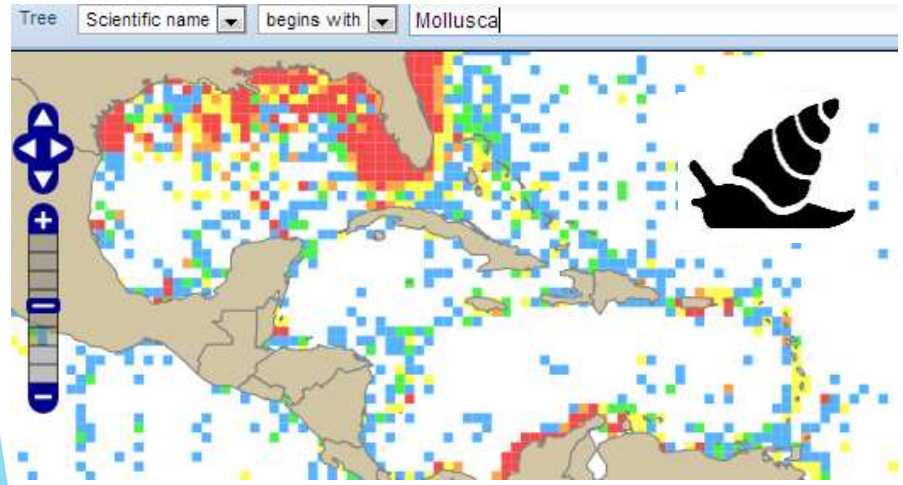


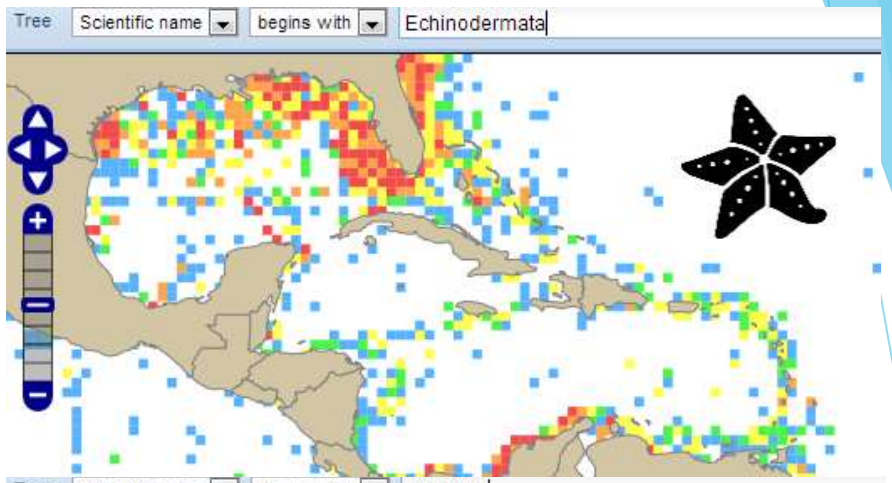
2009 - 7834 species of invertebrates

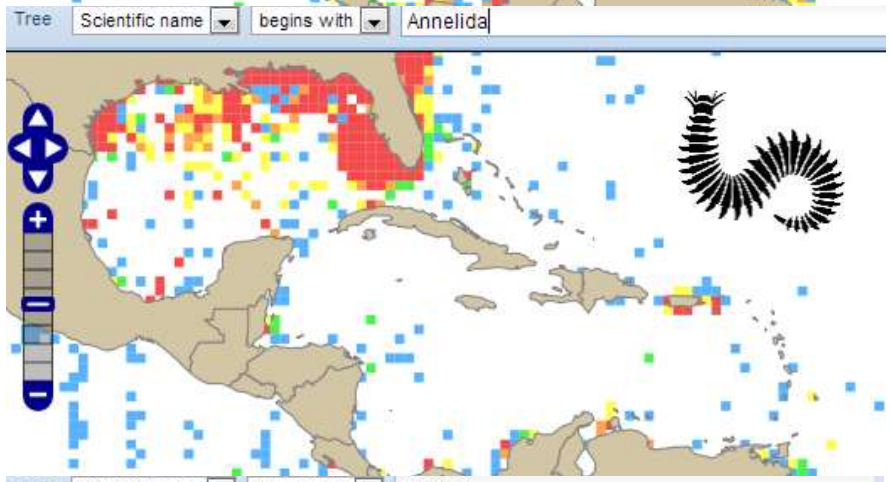
Group / taxa	Spp N	endm	%
vertebrates (fish)	1541		
cnidarians	792	62	7.8
sponges	339	109	32.2
crustaceans	2579	388	15.0
moluscs	2455	257	10.5
anelids	866	120	13.9
equinoderms	522	31	5.9
platelmints	705	191	27.1
briozoans	266	55	20.7
Tunicates	78	5	6.4

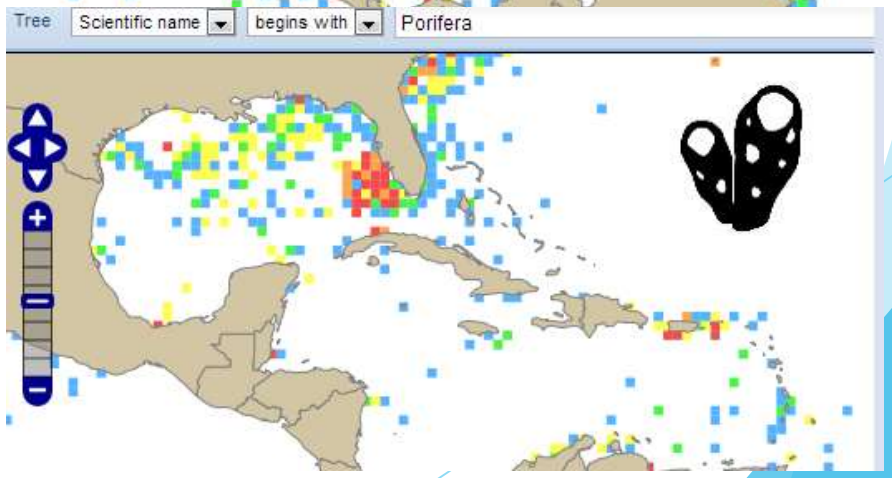








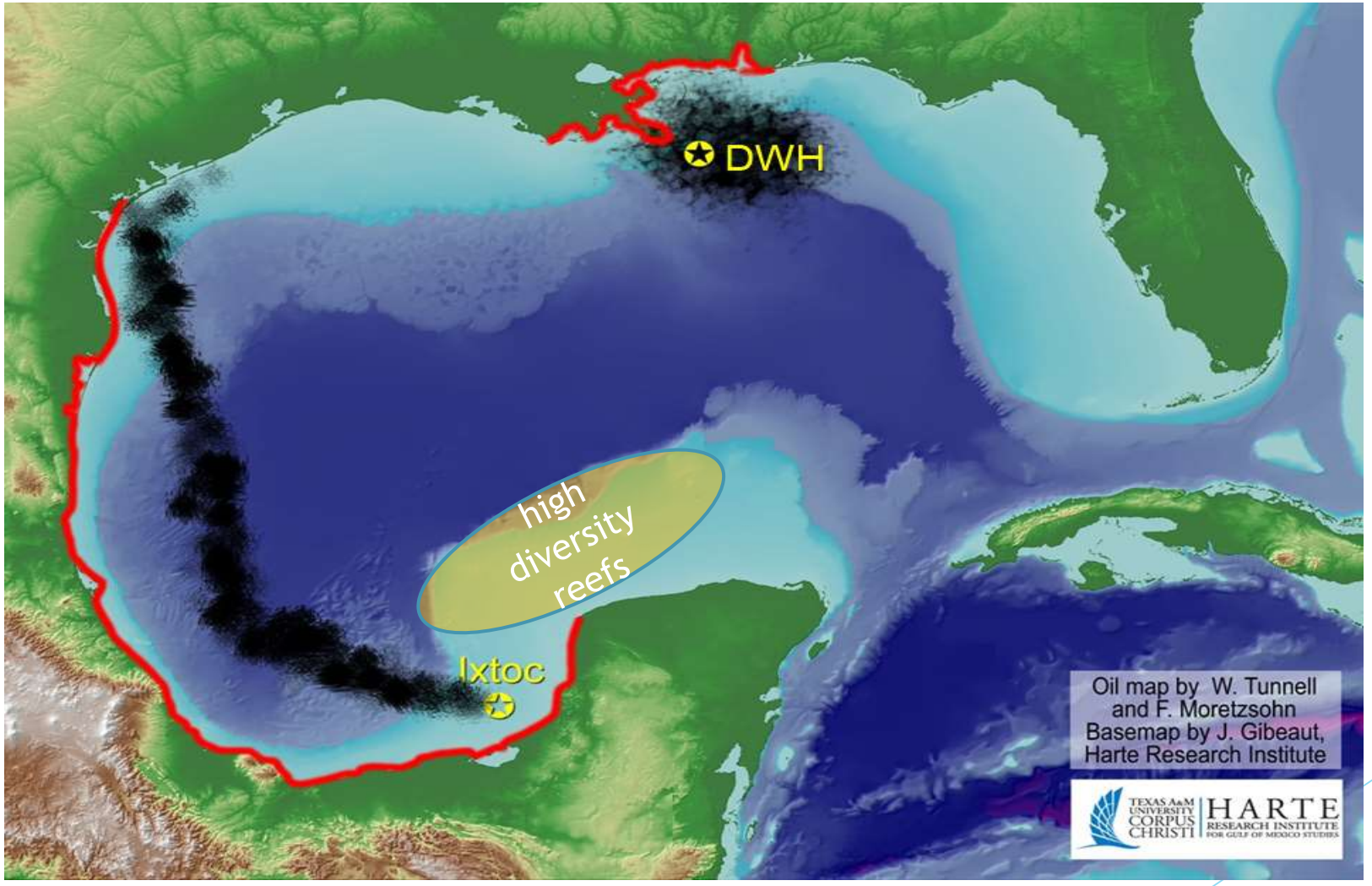




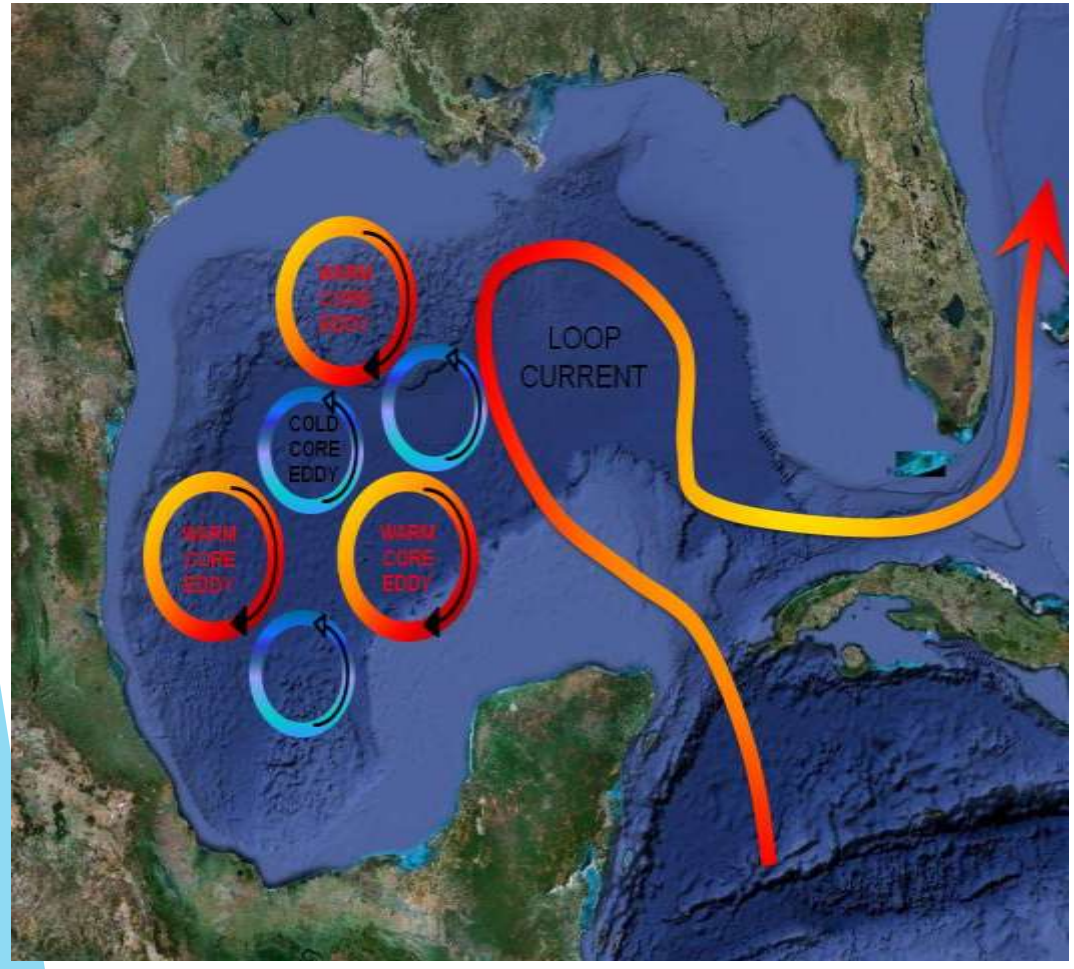
OBIS
OCEAN BIOGEOGRAPHIC INFORMATION SYSTEM

1) Training future Mexican biodiversity experts

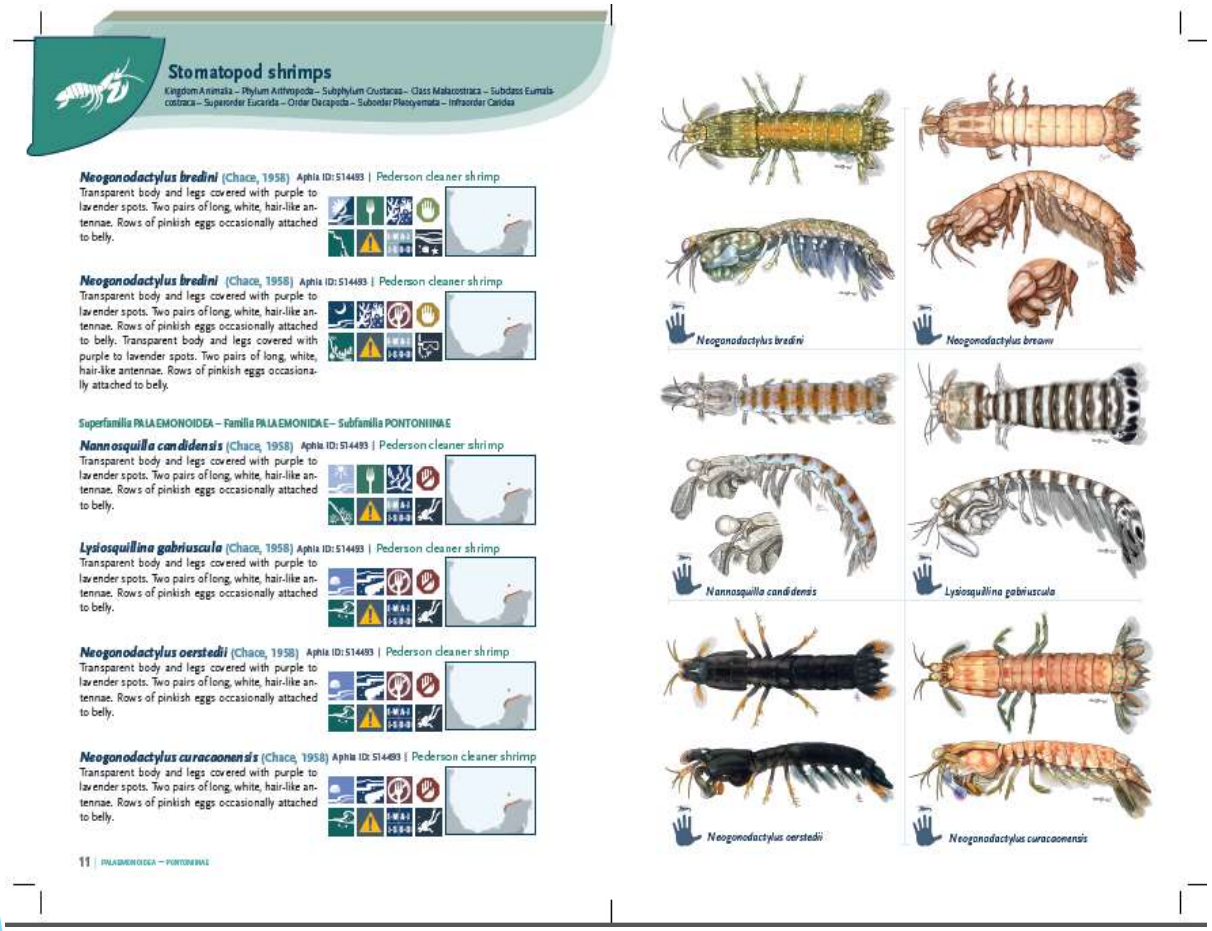
2) Generate biodiversity knowledge to better manage and mitigate potential negative impacts from the recently expanding offshore Mexico oil industry



3) Increase our understanding of the southern influence into the northern GMx biodiversity and fisheries



4) Produce high-quality public outreach materials in Spanish to foster education and training on marine biodiversity



Stomatopod shrimps

Kingdom Animalia – Phylum Arthropoda – Subphylum Crustacea – Class Malacostraca – Subclass Eumalacostraca – Superorder Eucarida – Order Decapoda – Suborder Pleocyemata – Infraorder Caridea

Neogonodactylus bredini (Chace, 1958) Aphia ID: 514493 | Pederson cleaner shrimp

Transparent body and legs covered with purple to lavender spots. Two pairs of long, white, hair-like antennae. Rows of pinkish eggs occasionally attached to belly.

Neogonodactylus bredini (Chace, 1958) Aphia ID: 514493 | Pederson cleaner shrimp

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Superfamilia PALAEMONOIDEA – Familia PALAEMONIDAE – Subfamilia PONTONIINAE

Nannosquilla candidensis (Chace, 1958) Aphia ID: 514493 | Pederson cleaner shrimp

Transparent body and legs covered with purple to lavender spots. Two pairs of long, white, hair-like antennae. Rows of pinkish eggs occasionally attached to belly.

Lysiosquillina gabriuscula (Chace, 1958) Aphia ID: 514493 | Pederson cleaner shrimp

Transparent body and legs covered with purple to lavender spots. Two pairs of long, white, hair-like antennae. Rows of pinkish eggs occasionally attached to belly.

Neogonodactylus oerstedii (Chace, 1958) Aphia ID: 514493 | Pederson cleaner shrimp

Transparent body and legs covered with purple to lavender spots. Two pairs of long, white, hair-like antennae. Rows of pinkish eggs occasionally attached to belly.

Neogonodactylus curacaoensis (Chace, 1958) Aphia ID: 514493 | Pederson cleaner shrimp

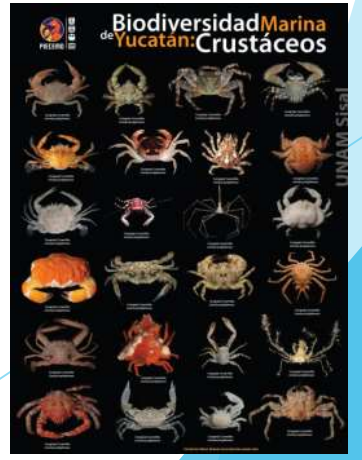
Transparent body and legs covered with purple to lavender spots. Two pairs of long, white, hair-like antennae. Rows of pinkish eggs occasionally attached to belly.

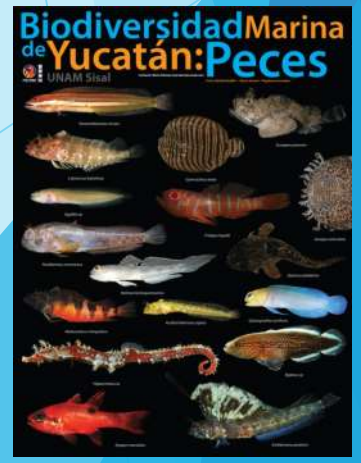
11 | PALAEMONOIDEA – PONTONIINAE

Neogonodactylus bredini *Neogonodactylus breuvv*

Nannosquilla candidensis *Lysiosquillina gabriuscula*

Neogonodactylus oerstedii *Neogonodactylus curacaoensis*





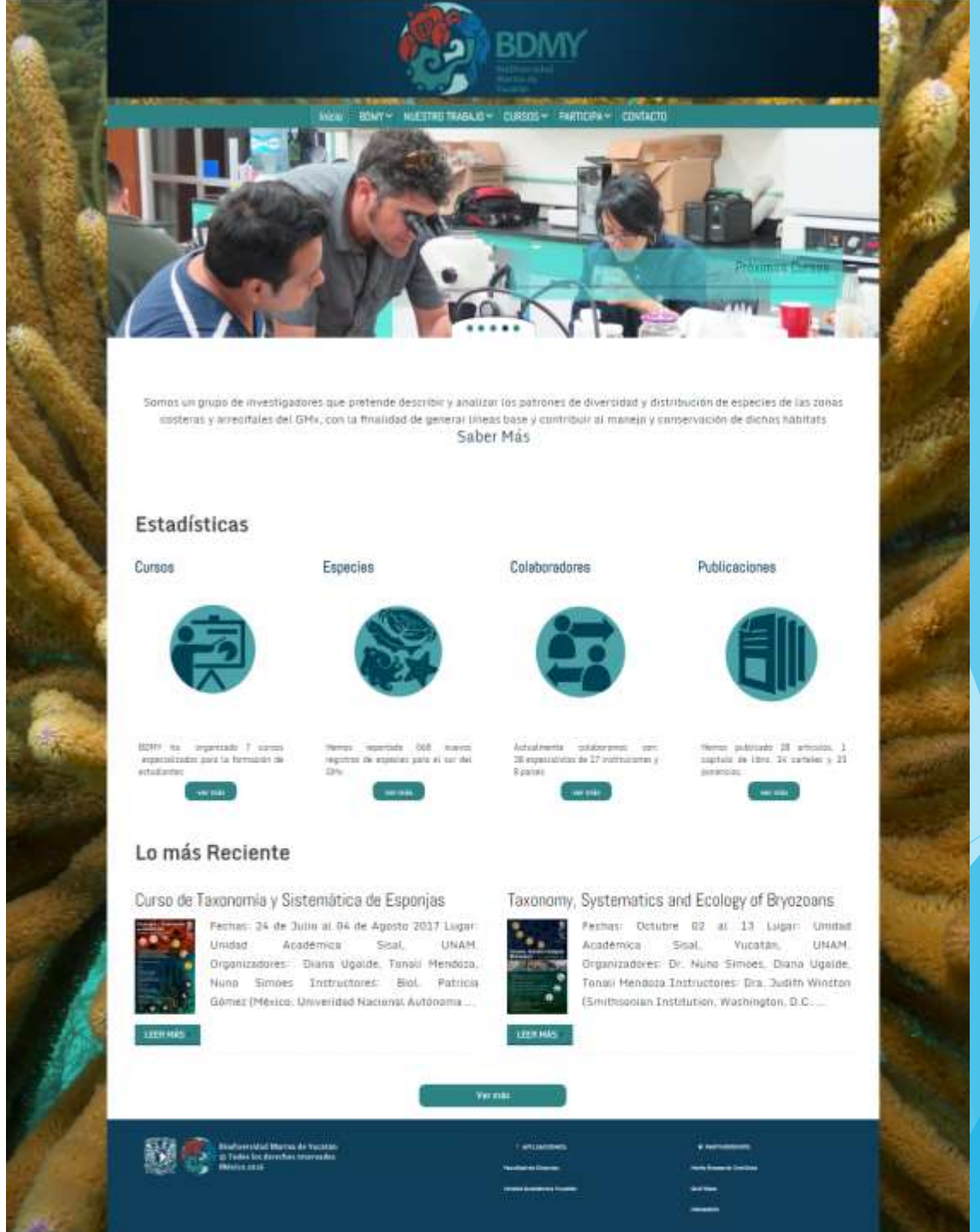
5) Support Mexico biodiversity agency (CONABIO) to increase their databases on the southern GMx marine species diversity, ecology and distribution

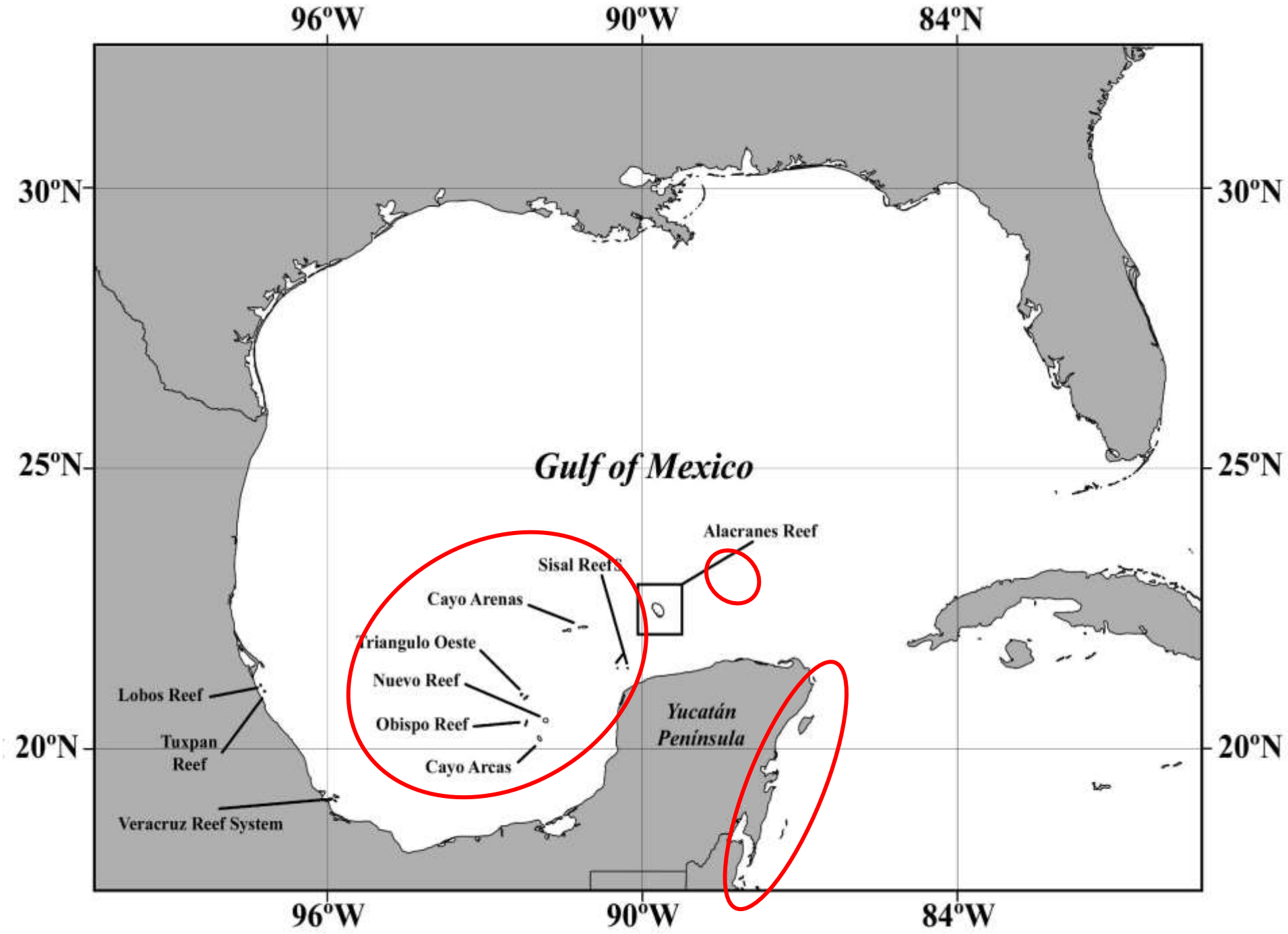
CONABIO

BDMY
BioDiversidad
Marina de
Yucatán

www.bdmy.org.mx

- New species, genus and families for science
- 200+ new species records for Mexico
- Focus on poorly described taxa
- Traditional taxonomy courses
- Discovery of three invasive species (*Charybdis helleri, Neopomacentrus cyanomus, Tubstrea coccinea*)
- Information for species distribution modelling
- Focus on communicating biodiversity science results to the wider public using visual media




96°W
90°W
84°N
30°N
25°N
20°N
Gulf of Mexico
Alacranes Reef
Sisal Reefs
Cayo Arenas
Triangulo Oeste
Nuevo Reef
Obispo Reef
Cayo Arcas
Lobos Reef
Tuxpan Reef
Veracruz Reef System
Yucatán Península

Alacranes Reef 2009



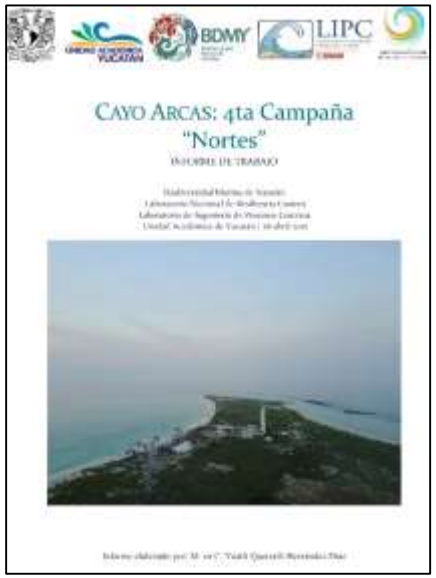


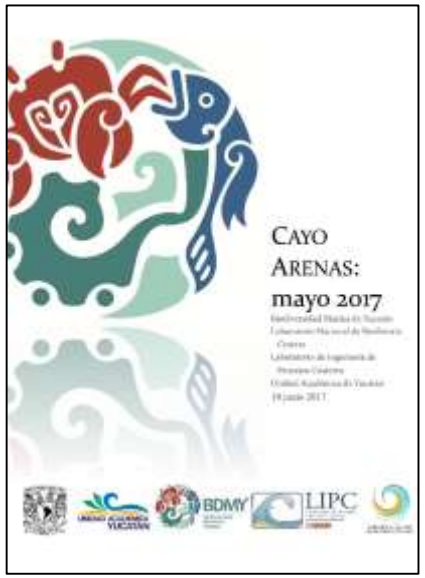

Celestun y Bajos de Sisal, 2011

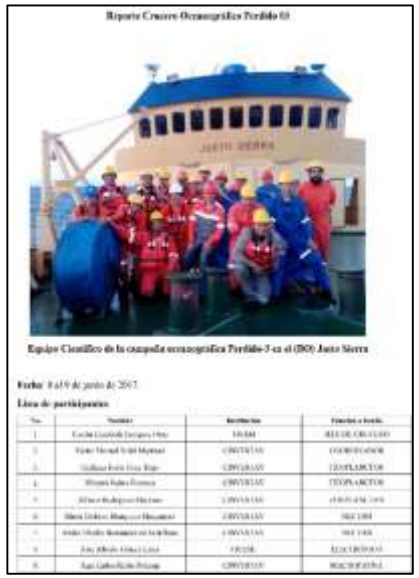
Cayo Nuevo y
Alacranes Reef 2016

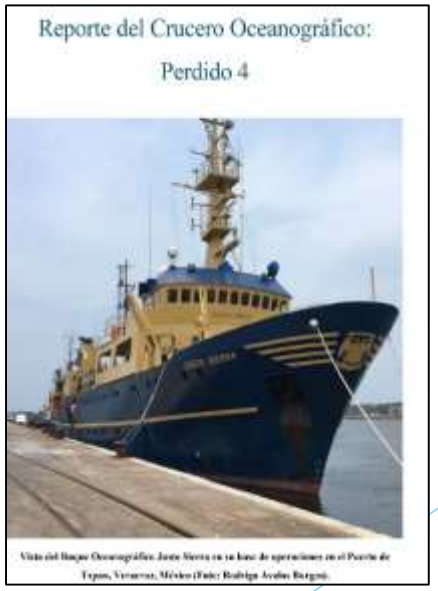
Triangulos, Obispos, Banco Pera, Banco Nuevo 2017

Scientific Expedition Reports (in spanish)

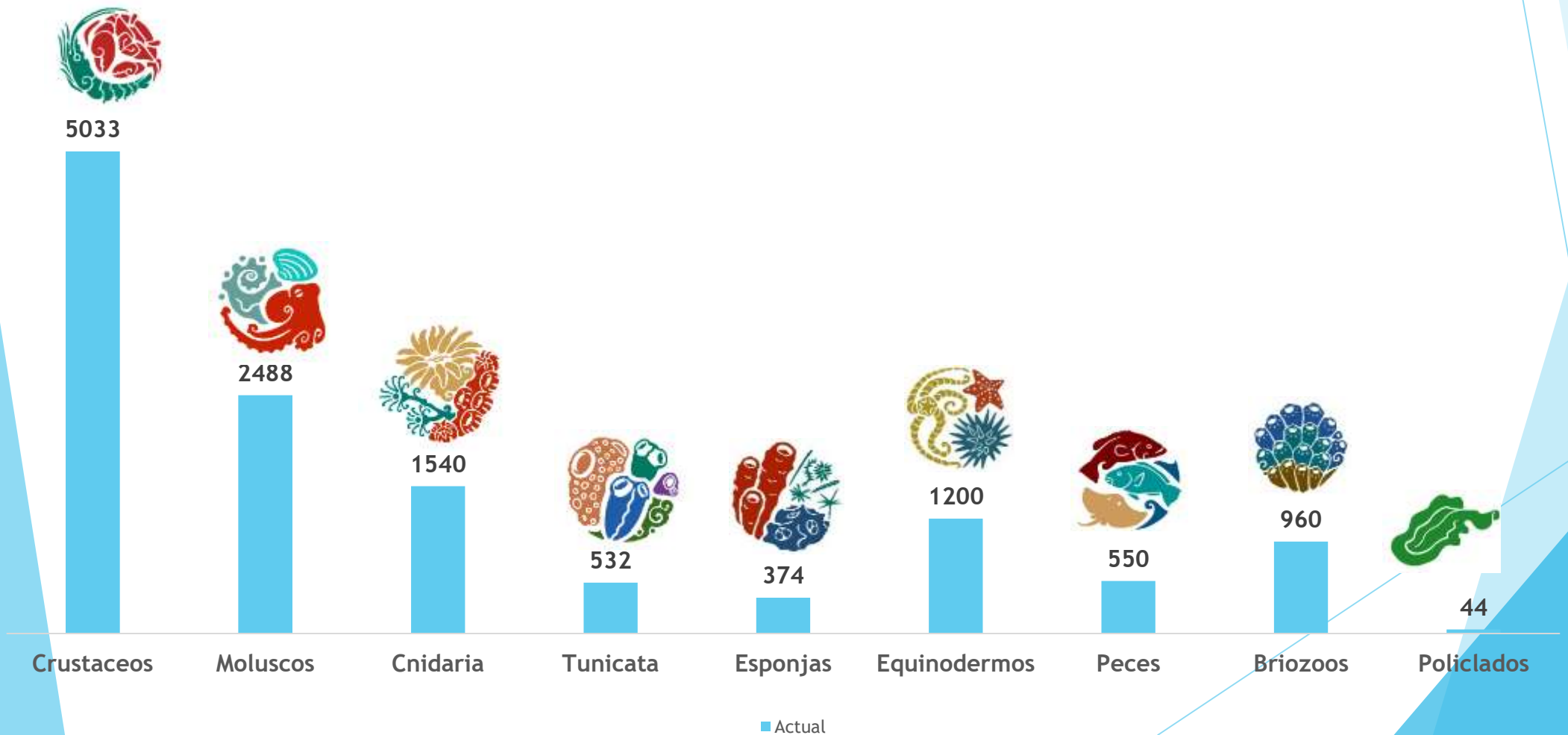




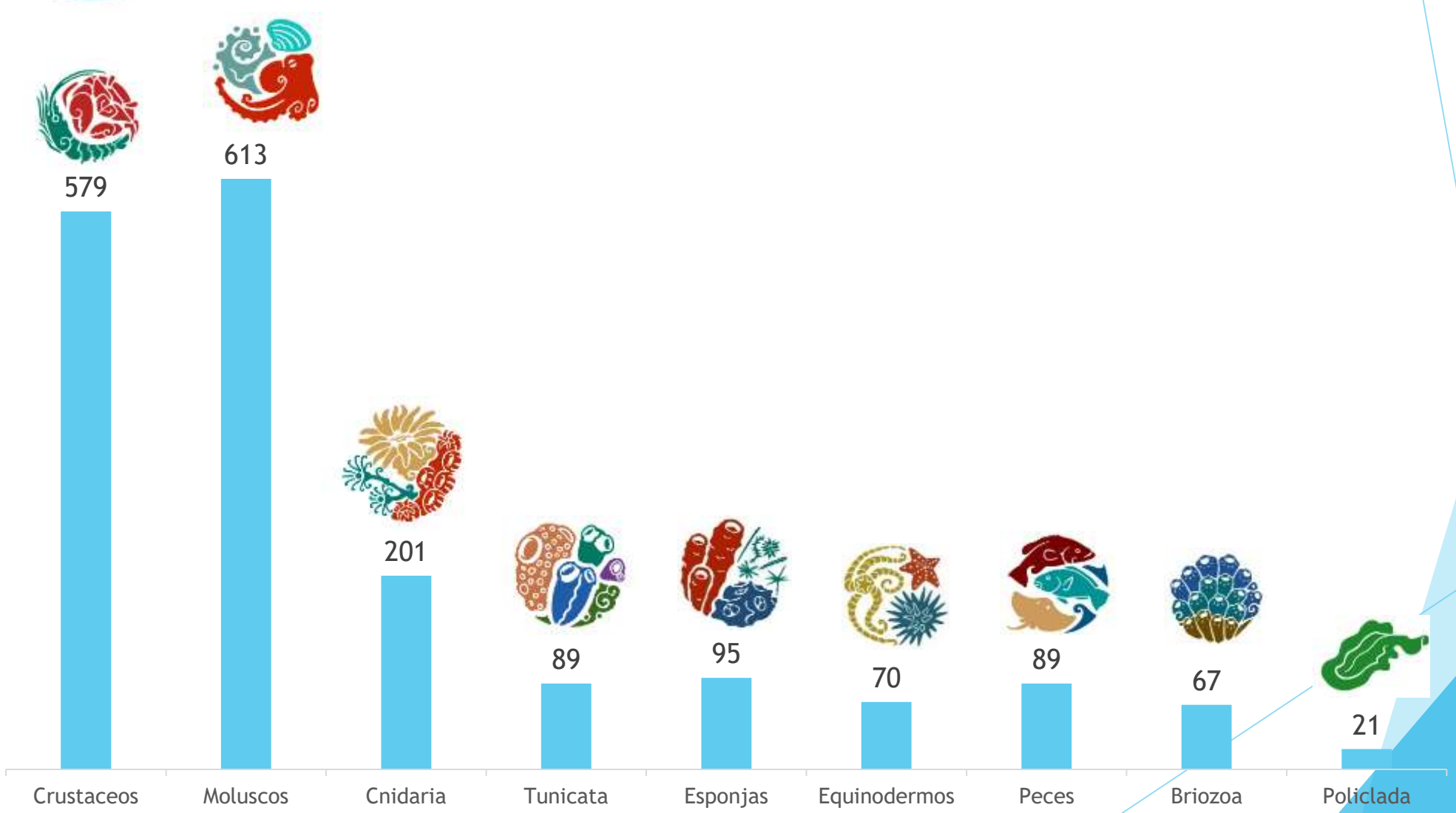




over 12,500 cataloged specimens

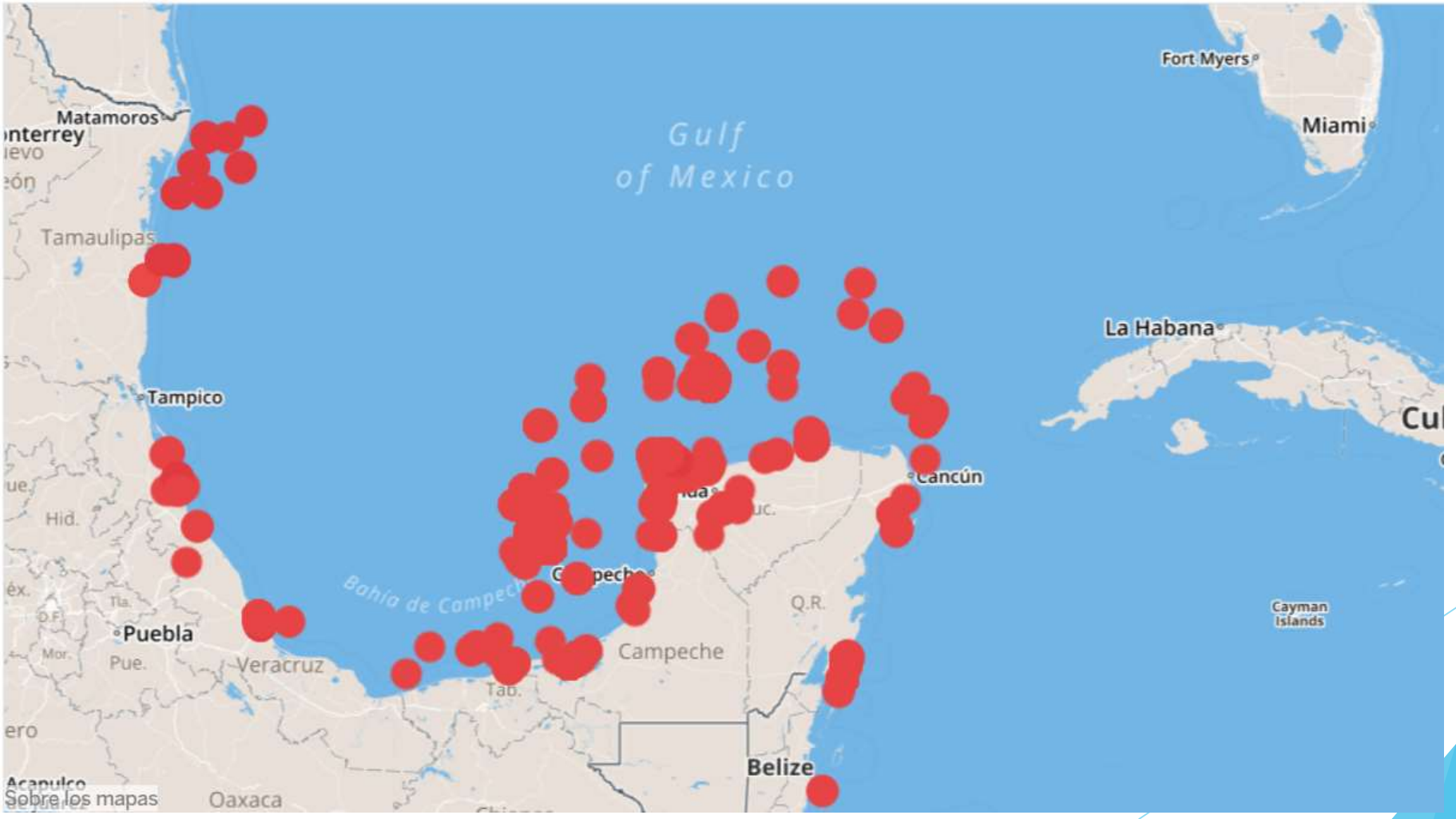


1824 Species in scientific colections



BDMY
BioDiversidad Marina de Yucatán

Geographical Scope



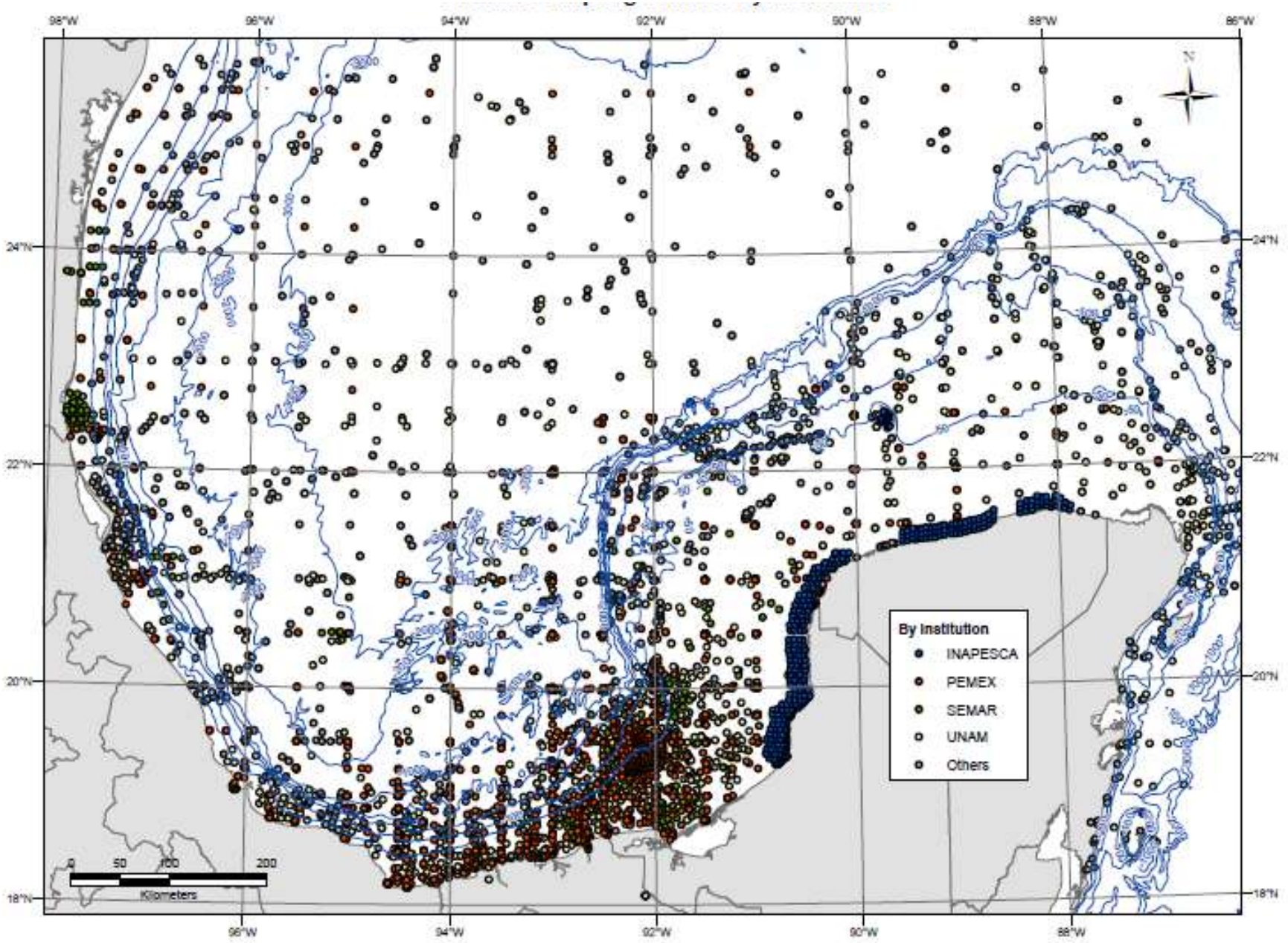
ECOSUR

Cinvestav
UNIDAD MERIDA

SEMAR
SECRETARÍA DE MARINA

BDMY
BioDiversidad
Marina de
Yucatán

Benthic Sampling stations (historic, by institution)

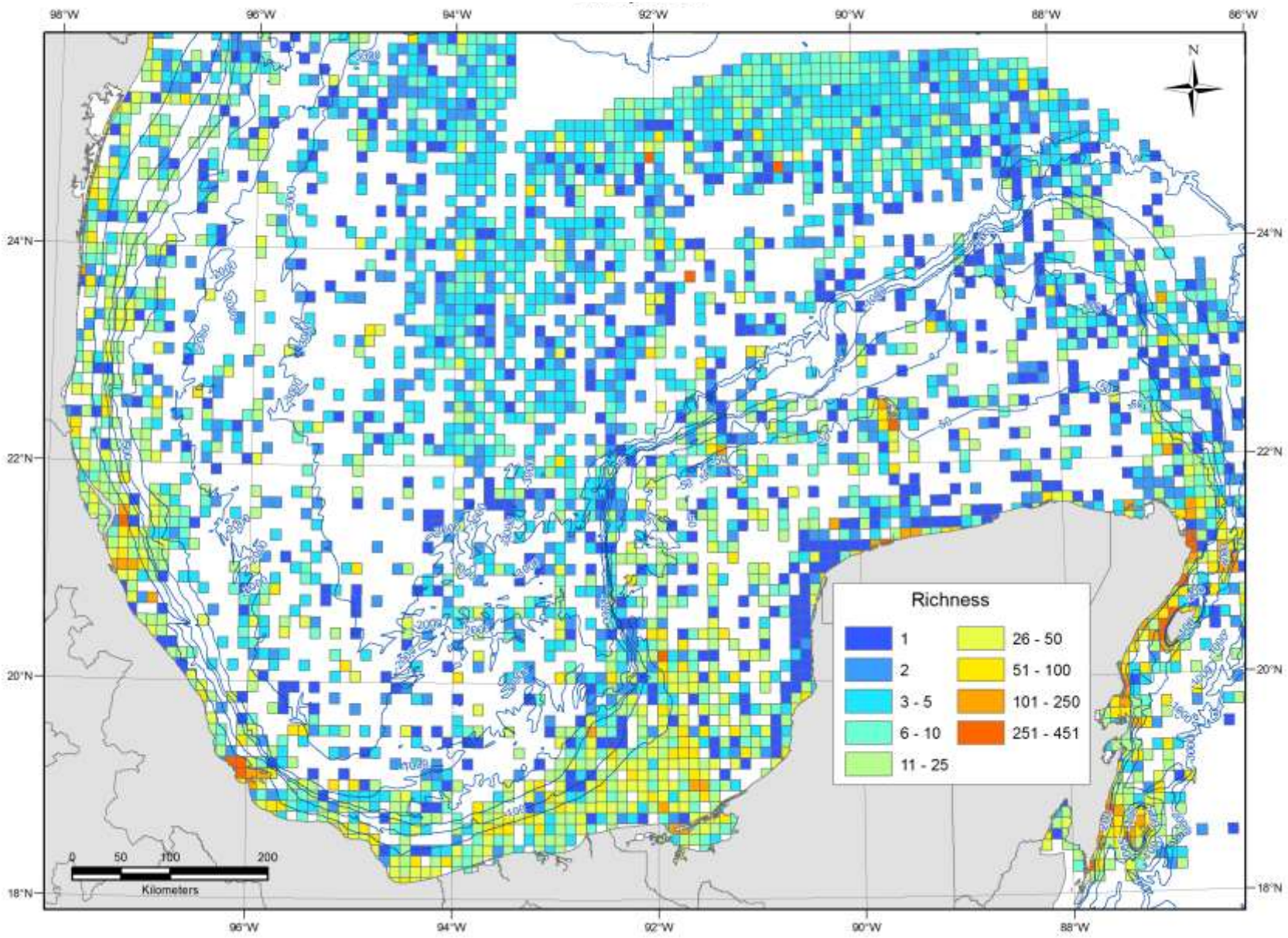


Registered sampling points

UNAM (excl.PEMEX) 1829
SEMAR 202
PEMEX 2560
INAPESCA 728
CINVESTAV (incl. PEMEX y otros)
OTROS 2758

Total: 8077 points

Relative species richness



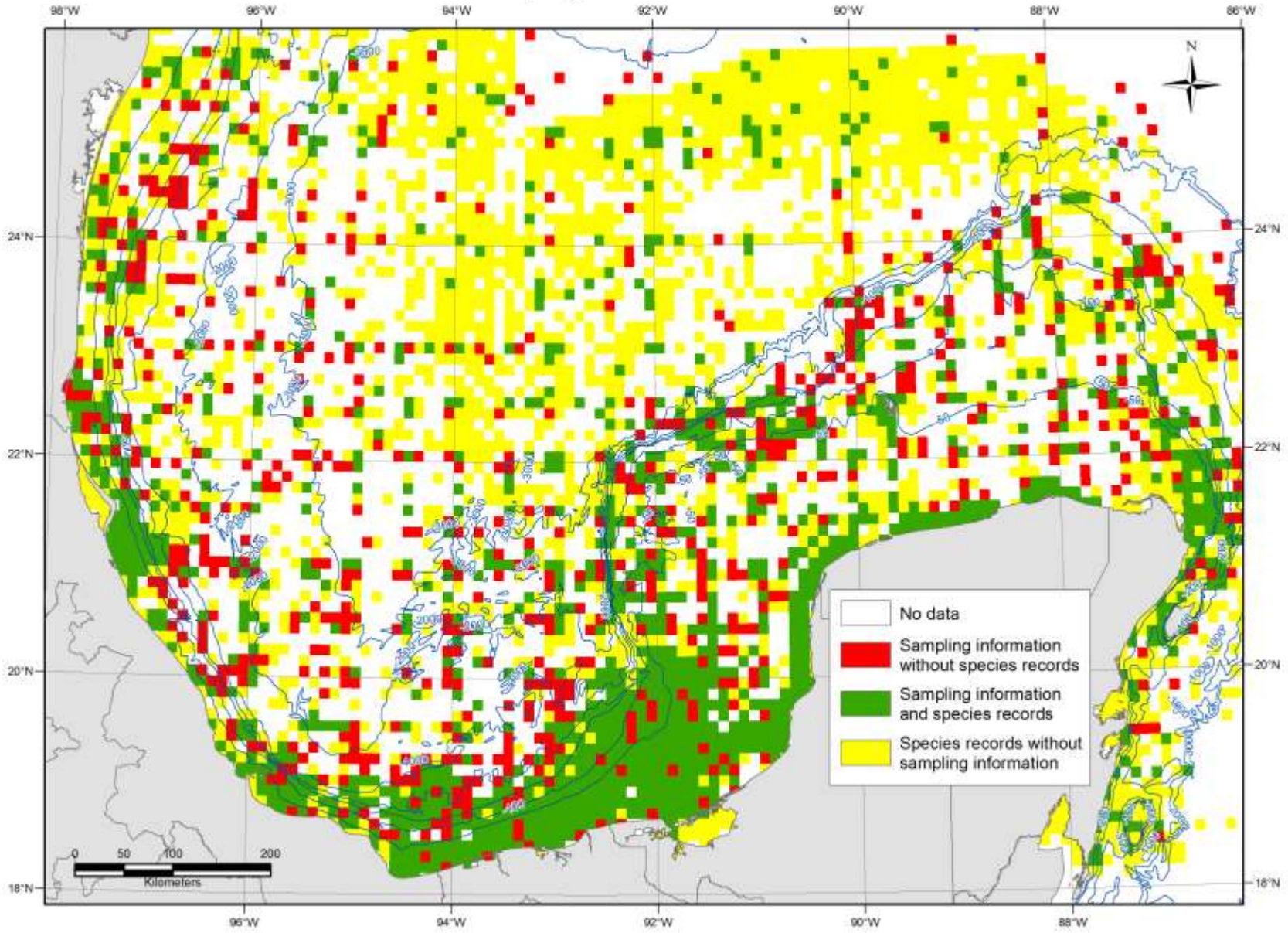
Pixel 0.1

Mexico's EEZ total pixeles = 7572

4015 pixels
Without information

53% no knowledge…

Benthic sampling and species records differences



2018

PeerJ Preprints — NOT PEER-REVIEWED

An Indo-Pacific damselfish in the Gulf of Mexico: origin and mode of introduction

D Ross Robertson, Omar Dominguez-Dominguez, Benjamin Victor, Nuno Simoes

A dataset on the species composition of amphipods (Crustacea) in a Mexican marine national park: Alacranes Reef, Yucatan

Carlos E. Paz-Ríos, Nuno Simões, Daniel Pech

Species richness and spatial distribution of benthic amphipods (Crustacea: Peracarida) in the Alacranes Reef National Park, Gulf of Mexico

Carlos E. Paz-Ríos · Nuno Simões · Daniel Pech

Received: 26 September 2017 / Revised: 21 December 2017 / Accepted: 26 December 2017

Anthopleura dalyae sp. nov. (Cnidaria: Actiniaria), a new species of sea anemone from the southern Gulf of Mexico

Ricardo González-Muñoz · Agustín Garese · Fabián H. Acuña

Received: 26 June 2017 / Revised: 18 December 2017 / Accepted: 3 January 2018

2016

ZooKeys 640: 139–155 (2016) — CHECKLIST — ZooKeys

The fishes of Cayo Arcas (Campeche Bank, Gulf of Mexico): an updated checklist

D. Ross Robertson, Horacio Perez-España, Enrique Nuñez Lara, Francisco Puc Itza, Nuno Simoes

2017

Ordinary kriging vs inverse distance weighting: spatial interpolation of the sessile community of Madagascar reef, Gulf of Mexico

Salvador Zarco-Perello and Nuno Simões

First report of the parasite crustacean *Leidya distorta* (Isopoda: Bopyridae) on the fiddler crab *Uca spinicarpa* (Decapoda: Brachyura) in Yucatán coasts, Mexico

Primer reporte del crustáceo parásito Leidya distorta *(Isopoda: Bopyridae) en el cangrejo* Uca spinicarpa *(Decapoda: Brachyura) en las costas de Yucatán, México*

Jesús Romero-Rodríguez, Sergio Guillén-Hernández, Nuno Simões

3D chemoecology and chemotaxonomy of corals using fatty acid biomarkers: Latitude, longitude and depth

Cátia Figueiredo, Miguel Baptista, Inês C. Rosa, Ana Rita Lopes, Gisela Dionísio, Rui J.M. Rocha, Igor C.S. Cruz, Ruy K.P. Kikuchi, Nuno Simões, Miguel Costa Leal, Inês Tojeira, Narcisa Bandarra, Ricardo Calado, Rui Rosa

Journal of Ocean

2016, Volum

New records of 'opisthobranchs' (Gastropoda: Heterobranchia) from Arrecife Alacranes National Park, Yucatan, Mexico

DENEB ORTIGOSA, ELIA LEMUS-SANTANA AND NUNO SIMÕES

An Indo-Pacific damselfish well established in the southern Gulf of Mexico: prospects for a wider, adverse invasion

D. ROSS ROBERTSON

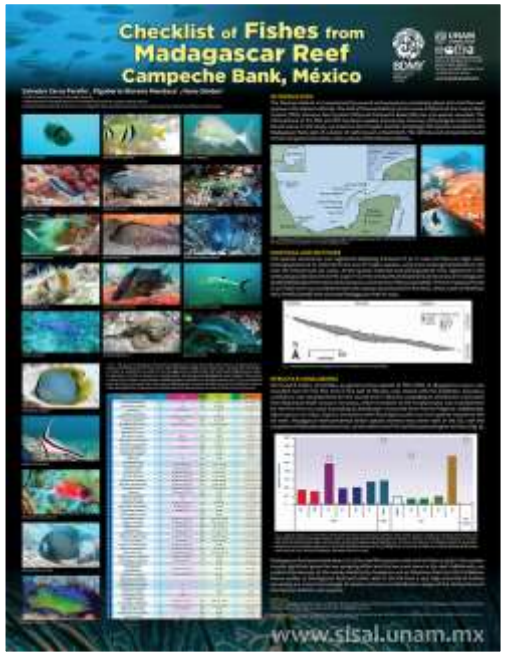
The social feather duster worm Bispira brunnea (Polychaeta: Sabellidae): aggregations, morphology and reproduction

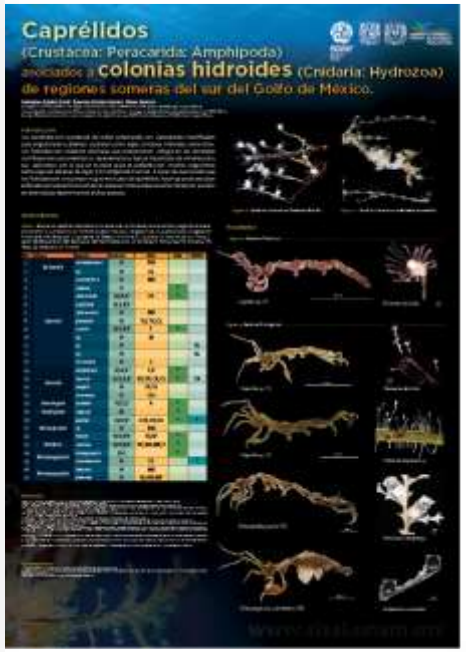
Yasmín Dávila-Jiménez , María Ana Tovar-Hernández & Nuno Simões

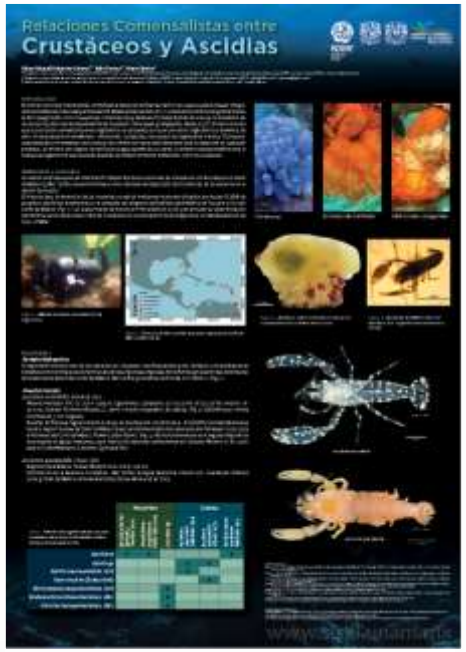
MARINE R

Sea anemones (Cnidaria: Actiniaria, Corallimorpharia, Ceriantharia, Zoanthidea) from marine shallow-water environments in Venezuela: new records and an updated inventory

Ricardo González-Muñoz, Nuno Simões, Edlin J. Guerra-Castro, Carlos Hernández-Ortiz, Gabriela Carrasquel, Enio Mendez, Carlos Lira, Martin Rada, Iván Hernández, Sheila M. Paula, Aldo Croquer and Juan J. Cruz-Motta

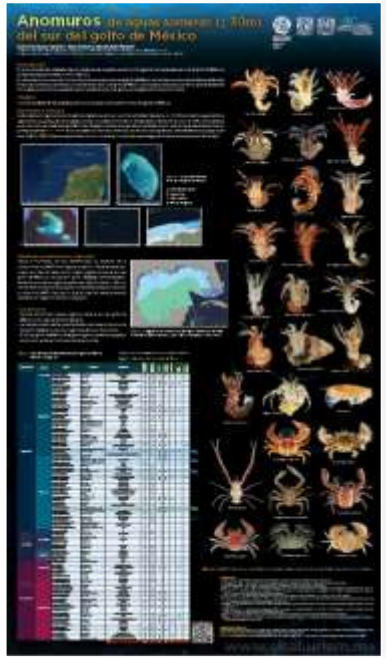

Checklist of Fishes from
Madagascar Reef
Campeche Bank, México
www.sisal.unam.mx

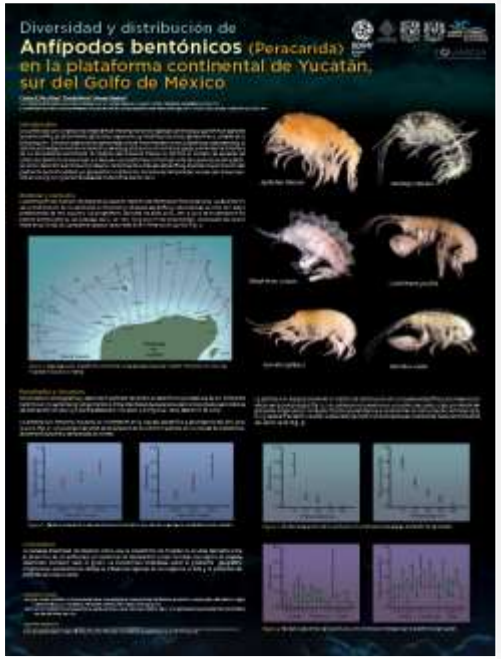

Caprélidos
(Crustacea: Peracarida: Amphipoda)
colonias hidroides (Cnidaria: Hydrozoa)
de regiones someras del sur del Golfo de México.


Relaciones Comensalistas entre
Crustáceos y Ascidias

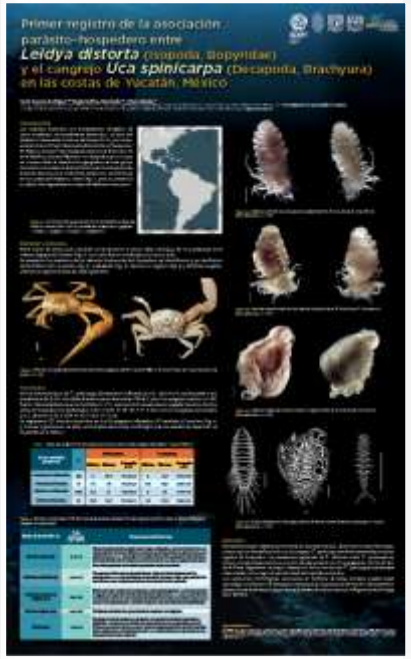

Hidroides (Cnidaria: Hydrozoa)
de ambientes someros del Atlántico mexicano


Diversidad de Equinodermos (Phylum Echinodermata)
en Cayo Arcas, Campeche


Anomuros
del sur del golfo de México


Diversidad y distribución de
Anfípodos bentónicos (Peracarida)
en la plataforma continental de Yucatán,
sur del Golfo de México


Moluscos intersticiales
de Cayo Nuevo, Golfo de México:
Resultados preliminares
de la composición taxonómica
www.bdmy.org.mx


Primer registro de la asociación
parásito-hospedero entre
Leidya distorta
y el cangrejo Uca spinicarpa
en las costas de Yucatán, México


On the presence of
Charybdis helleri
(Milne-Edwards, 1867)
along the Mexican coast of the Gulf of Mexico
www.sisal.unam.mx

Courses Organized (since 2016)

- **8** courses
- **19** instructors
- **148** attendees
- **69** class days
- **>570** teaching hours
- **11** countries

Country	alumni	Instructors
México	105	6
Colombia	14	1
Argentina	3	
Costa Rica	1	
Perú	2	
Honduras	1	
Chile	1	
Cuba	1	
Brasil	4	6
USA	1	2
Venezuela		4

BDMY
BioDiversidad Marina de Yucatán

OBIS, 2017

- 3 instructors
- 22 students
- 5 days
- 42 hrs

Sponges 2017

- 5 instructors
- 11 students
- 10 days
- 80 hrs

Bryozoans, 2017

- 2 instructors
- 12 students
- 10 days
- 80 hrs

Molluscs, 2018

- 4 instructors
- 18 students
- 8 ddays
- 72 hrs

Tunicates, march 2018

- 3 instructors
- 13 students
- 10 days
- 90 hrs

High Quality Scientific illustrations based on good macro photography

High Quality Scientific illustrations based on good macro photography

Stomatopod shrimps

Kingdom Animalia – Phylum Arthropoda – Subphylum Crustacea – Class Malacostraca – Subclass Eumalacostraca – Superorder Eucarida – Order Decapoda – Suborder Pleocyemata – Infraorder Caridea

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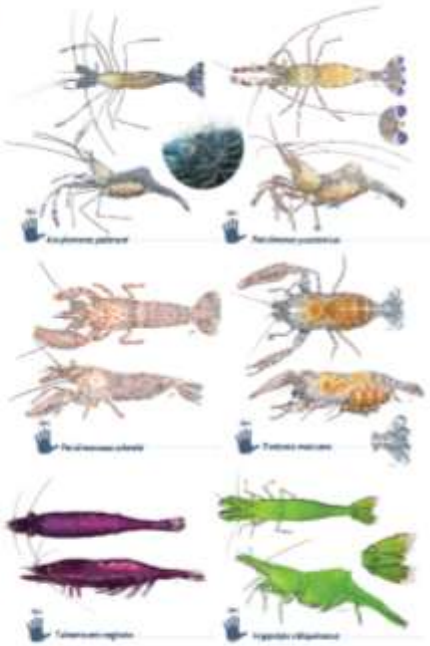
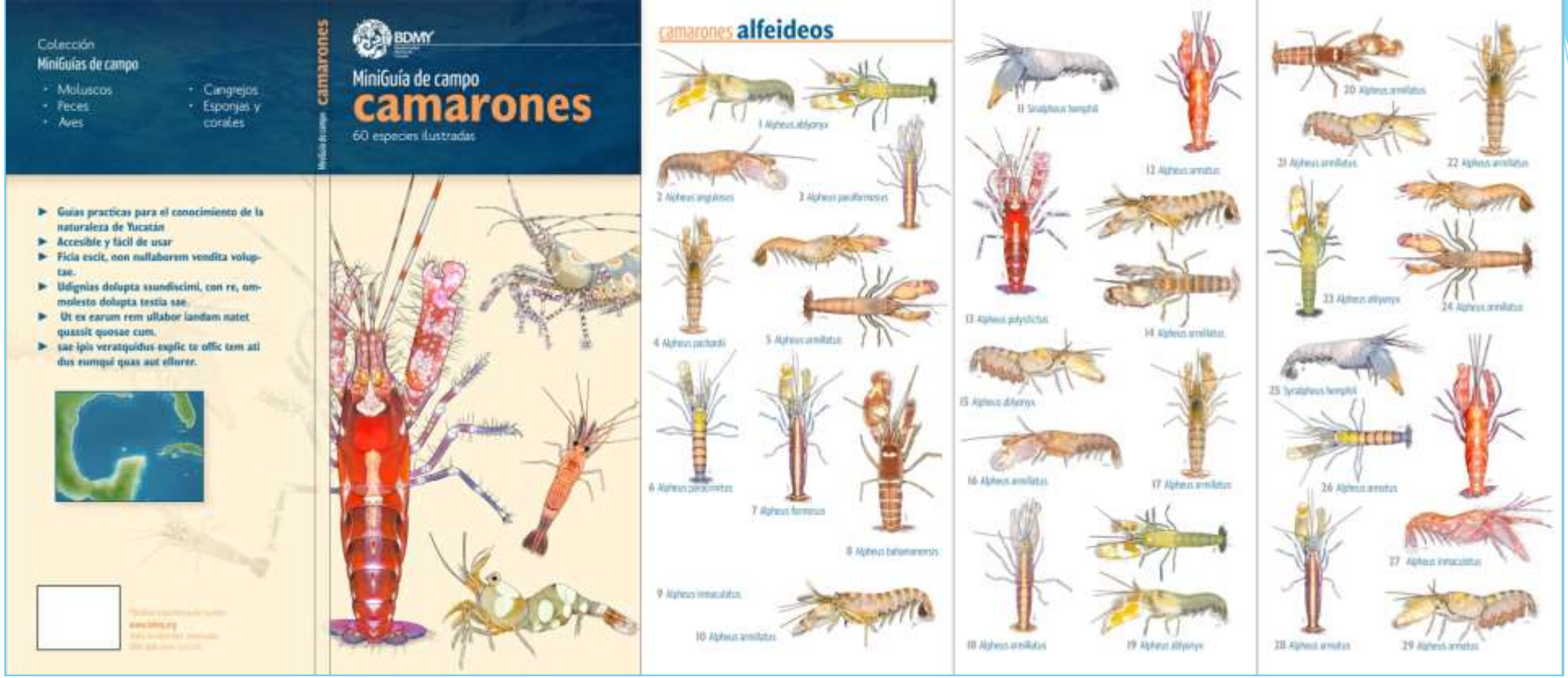
11 | PALAEMONOIDEA – PONTONIINAE

Pinnotherid crabs



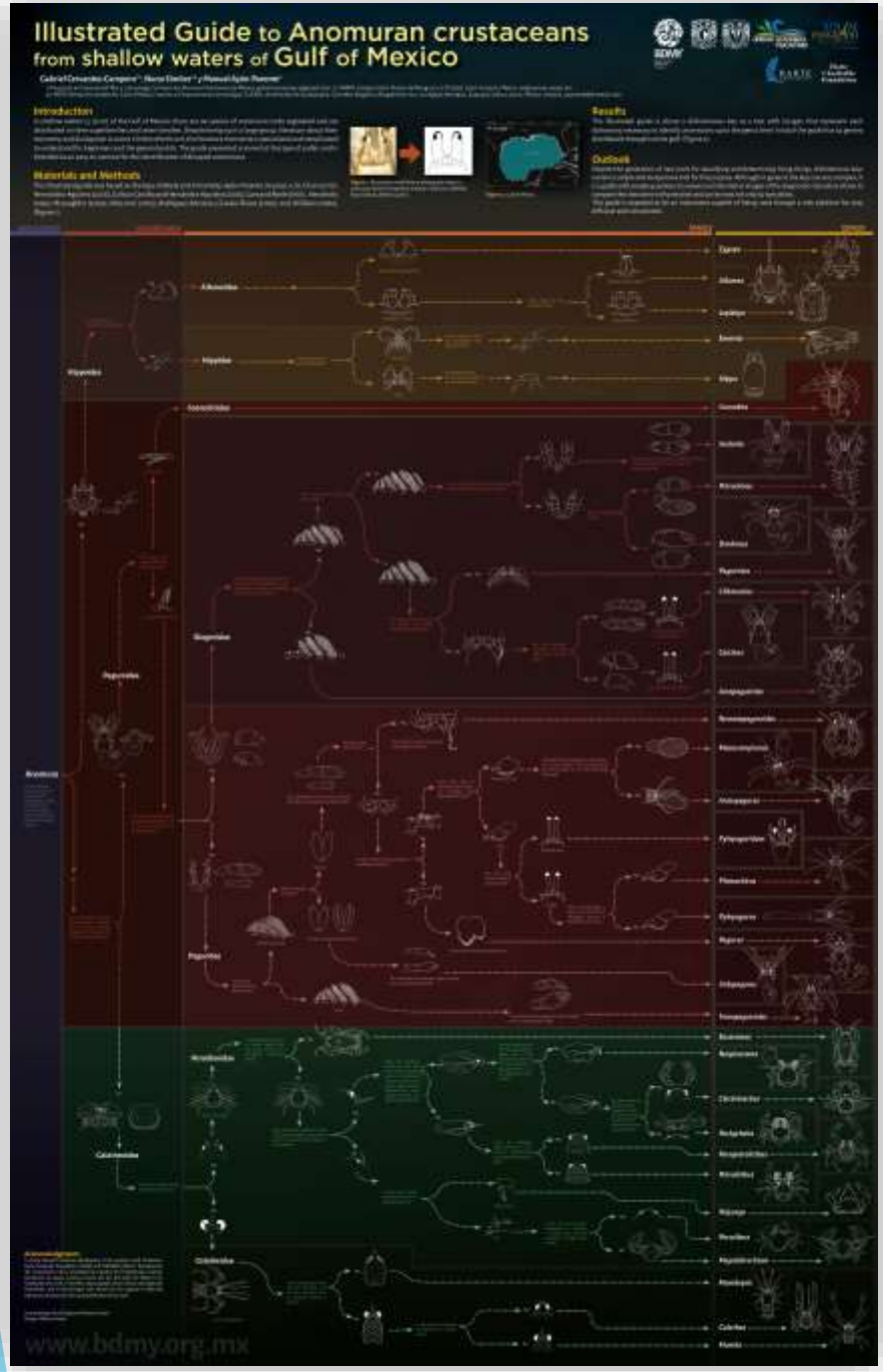
Stomatopod shrimps

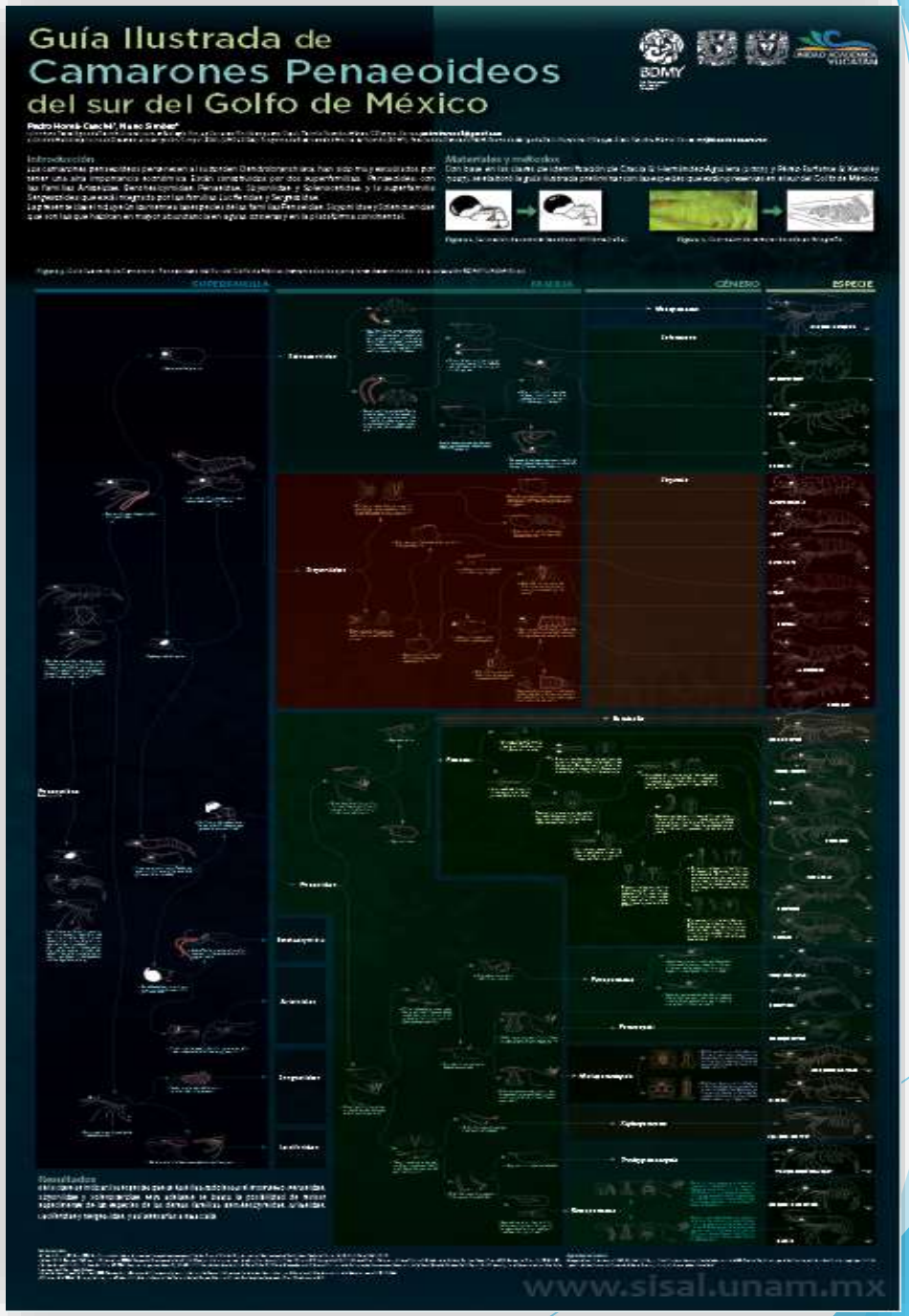
Caridean shrimps



General Public Field Guides

Coastal and Marine Biodiversity Posters





Dichotomous Identification Keys

IPT | Recibidos | Página prin | Informe_BD | Biodiversid | Biodiversid | Biodiversid | Biodiversid

www.bdmy.org/cgi-bin/cve.cgi?cve=10

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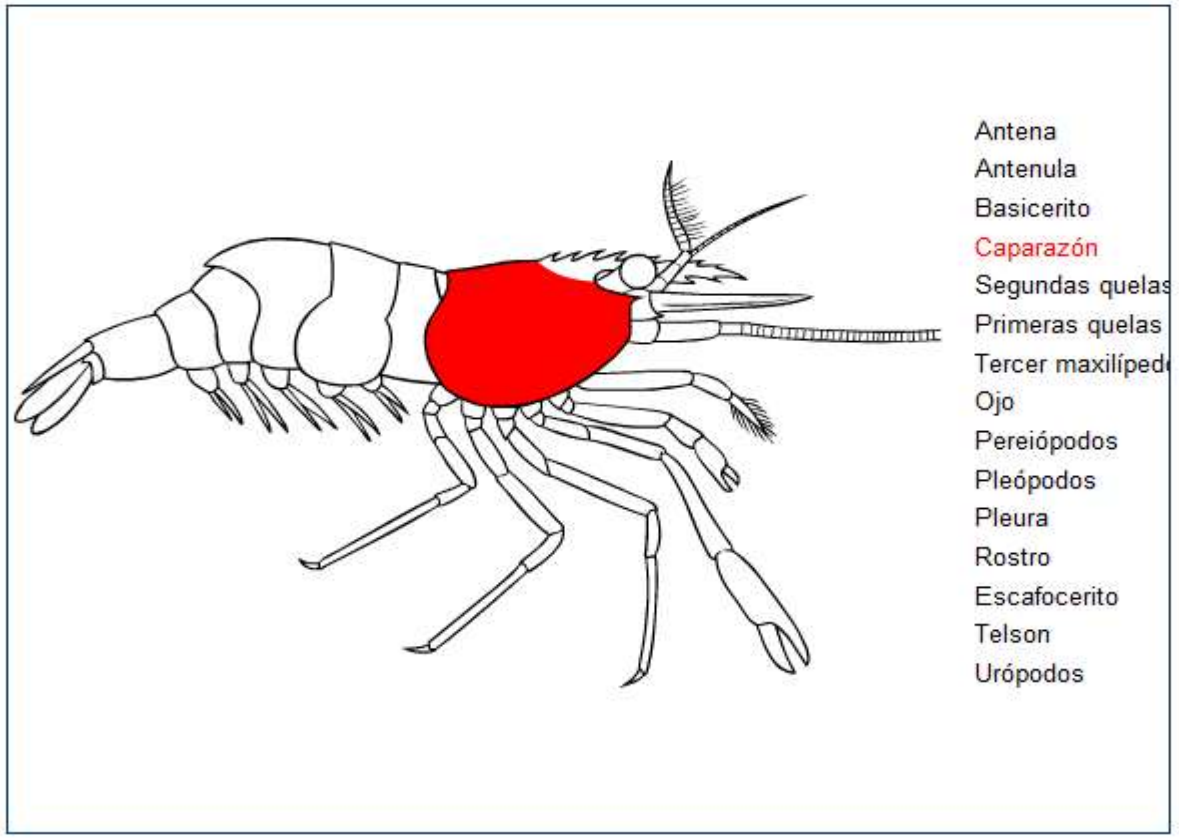
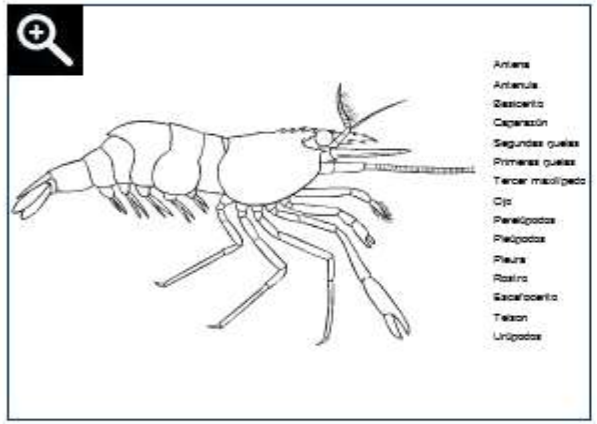
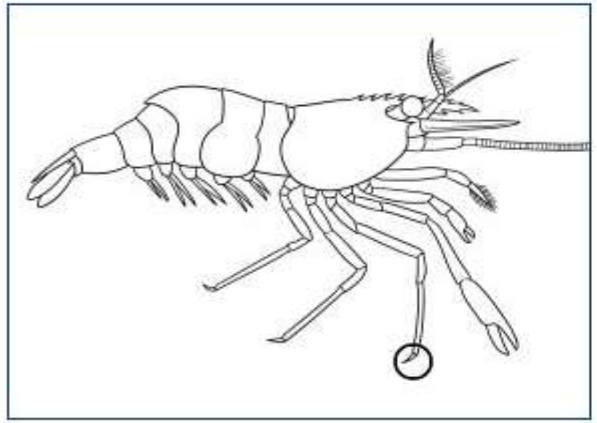
Texto de introducción a claves

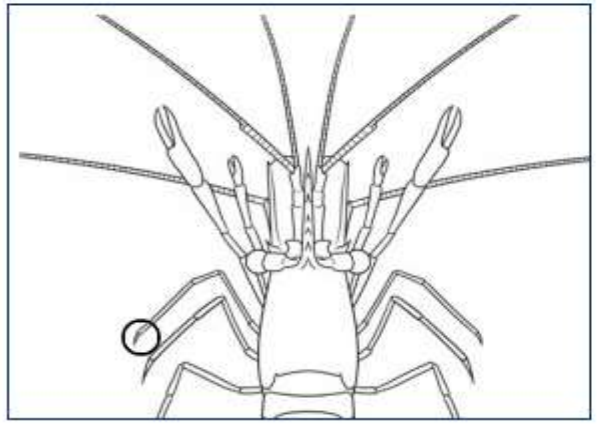
Titulo de la clave



Iniciar



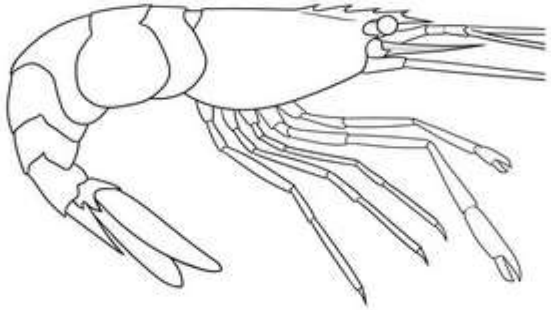




Paso 1

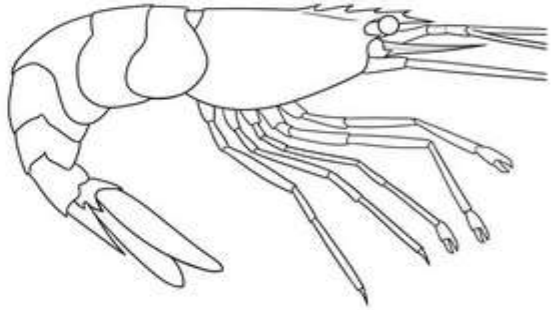
Sin quela en el tercer pereiopodo; pleura del segundo somito abdominal sobrelapada en el primer y tercer segmento (reducida en Glyphocrangonidae)

Seleccionar esta opción



Quela presente en el tercer par de pereiopodos, ocacionalmente pequeña; pleura del segundo somito abdominal no sobrelapando en el primer segmento

Seleccionar esta opción



Regresar

Iniciar de nuevo

The Future? Sustained coastal and ocean observing systems in Mexico?

- Essential biodiversity variables
- Video and Acoustic monitoring
- Taxonomy to calibrate eDNA
- Species functional traits matrix
- Species interactions maps
- Species distribution modelling
- Trinational GMx species diversity web portal
- GMx OBIS node project

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