Final Evaluation Report

Your Details	
Full Name	Laura Rose Vanopdenbosch
Project Title	INMOLO - Invertebrate Monitoring and Localization in and around Caño Island and Marino Ballena National Park, Costa Rica.
Application ID	30163-1
Grant Amount	5,983 £ sterling
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Date of this Report	14/11/2020

1. Indicate the level of achievement of the project's original objectives and include any relevant comments on factors affecting this.

Objective	Not achieved	Partially achieved	Fully achieved	Comments
Creation of an inventory of Marine Invertebrates in Caño Island.			■	A successful inventory of marine invertebrates has been achieved in Caño Island Biological Reserve. With a total of 852 observations of 116 species, we have been able to create an online database and to write a book describing every species with pictures associated. We have considered the inventory successful given the species richness (number of species observed) and number of observations made, in the time allotted (6 weeks). See also additional statistical analysis in Annex 11.
Creation of an inventory of Marine Invertebrates in Marino Ballena National Park.		■		The inventory of marine invertebrates of Marino Ballena National Park has been challenging due to the COVID19 pandemic. Nevertheless, we have been able to record 315 observations of 80 species. We have created another online database and written another book including the 80 species described and observed in the national park that is now available online as well as at the entrance of the park. By involving the local community in the creation of the inventory, we believe the project will continue. Locals will still be able to send observations of invertebrates to the database. With the support of the Innoceana team, the database and inventory will keep growing in the long term. Statistical analysis can be found in the Annex 12.
Public Engagement			■	During the INMOLO project, we have been able to engage the local

				community as well as tourists in the progression of the project. Through in-person, as well as virtual talks, we have been able to share the INMOLO concept and results. Multiple observations of invertebrates have been received through the online INMOLO form. Pictures from tourists and local guides have been used in the collaborative book, crediting the name of the author for recognition.
Improve Species Protection				With 12 new reports of species, the INMOLO project has enabled us to create important distribution data, essential for any conservation measures to be taken. Moreover, the multiple talks organised in the local community, has improved awareness of marine invertebrates in general, and of *Lobatus galeatus* (giant conch) in particular. This mollusc species is highly locally threatened and yet illegally fished around Caño Island and Marino Ballena National Park. The project has induced the rangers and local guides to take the importance of reporting illegal fishing in the area more seriously. Finally, in Marino Ballena National Park, data generated by INMOLO has allowed the local authorities to close the access to the rocky part of the natural tombolo which hosts an important biodiversity of shell molluscs.

2. Please explain any unforeseen difficulties that arose during the project and how these were tackled.

The first difficulty that arose was of course the COVID19 pandemic. Indeed, in March 2020, all national parks and biological reserves of Costa Rica closed their doors to both tourism and research. Luckily, we had just finished our 6 weeks of field research in Caño Island Biological Reserve (February and beginning of March 2020). Nevertheless, we had just started the work in Marino Ballena National Park when the park closed in March 2020. The park remained closed until the end of June 2020. We used those 2 months out of the field wisely and took the time to analyse all the data collected in Caño island, identify species, write the collaborative book, and organise online webinars.

The shutdown of the national park resulted in a delay of the field work and forced us to schedule our fieldwork in July and August 2020 which unfortunately corresponds to the start of the rainy season in Costa Rica. From June to November, the rainy season leads to rough sea conditions, bad visibility and stronger currents. Despite those conditions, we worked hard and succeeded in monitoring in Marino Ballena until the end of August 2020, by limiting our field work to days with favourable weather conditions.

Due to Covid 19 disruptions as well as limitations on night diving in the national park, we have recorded fewer observations in Marino Ballena than in Caño Island. Indeed, many species were only observed when monitoring after sunset in Caño Island, since most marine invertebrates can be more easily observed at night when they leave their hidden place to feed. For the Caño Island inventory, we had the opportunity to live with the rangers and sleep on the island, allowing us to observe and study invertebrate populations in much more depth over longer periods of time.

Finally, while the COVID19 pandemic led to the shutdown of schools, hotels and dive shops, preventing us from organising physical talks, we have been adapting to the situation. We have created a free online webinar series during the quarantine, training 604 people around the world on the importance of marine invertebrates for the ecosystem and specifically on the work that was being done in Caño Island and Marino Ballena. We have also organised special virtual talks for dive centres and the Government of Costa Rica to share our results and the project. Here is a list of the online webinars, the number of people that attended each talk, and links to the replays.

Date	**Audience**	**Participants (English)**	**Participants (Spanish)**
13/04/2020	International	95 https://my.demio.com/recording/sYAdIqja	91 https://my.demio.com/recording/FURU94Ba
23/04/2020	Local community and Costa Rican government		35 https://my.demio.com/recording/3csNvdoy
6/05/2020	International	92 https://my.demio.com/recording/HDQtQK4U	77 https://my.demio.com/recording/aS2ZecBJ
14/05/2020	Scuba Diving community of Costa Rica		23 https://my.demio.com/recording/qnV0lhdG
5/06/2020	International	91 https://my.demio.com/recording/NJu1klBs	

8/06/2020	Costa Rican government and Universities		53 https://my.demio.com/recording/BL1oQT1h
1/07/2020	Caribbean community of Costa Rica		47 https://my.demio.com/recording/ldllahwO

International attendance distribution for the Online Webinars

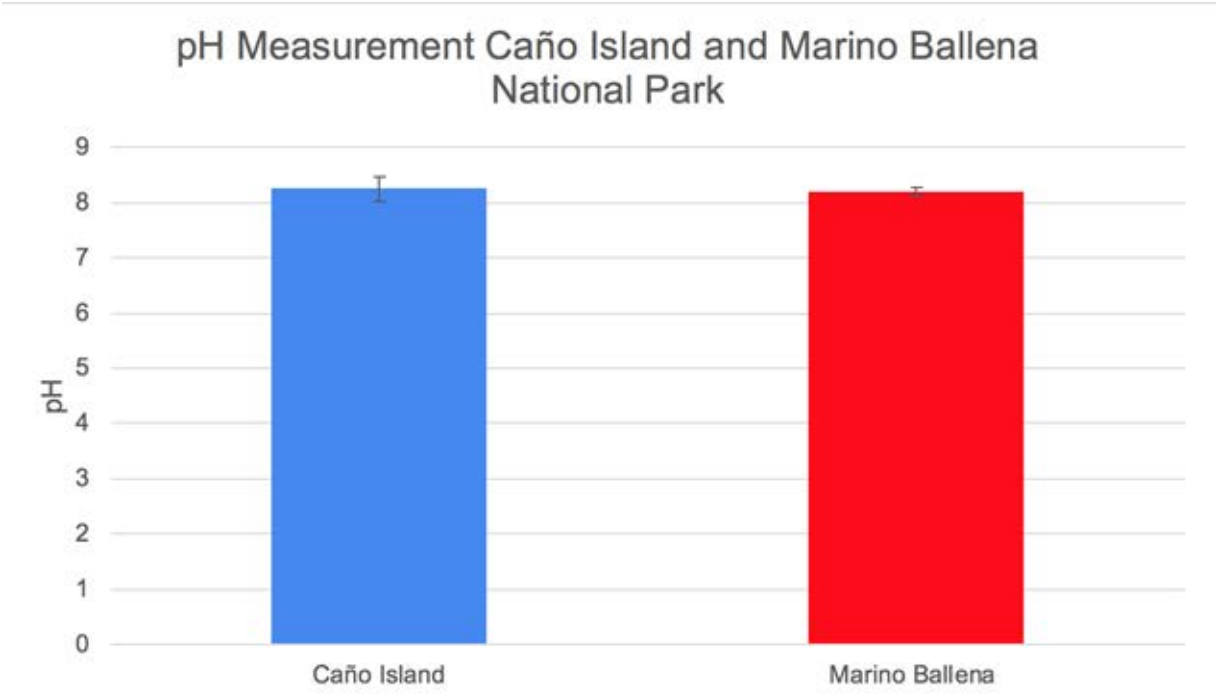
3. Briefly describe the three most important outcomes of your project.

1. Creation of an inventory and generation of scientific data.

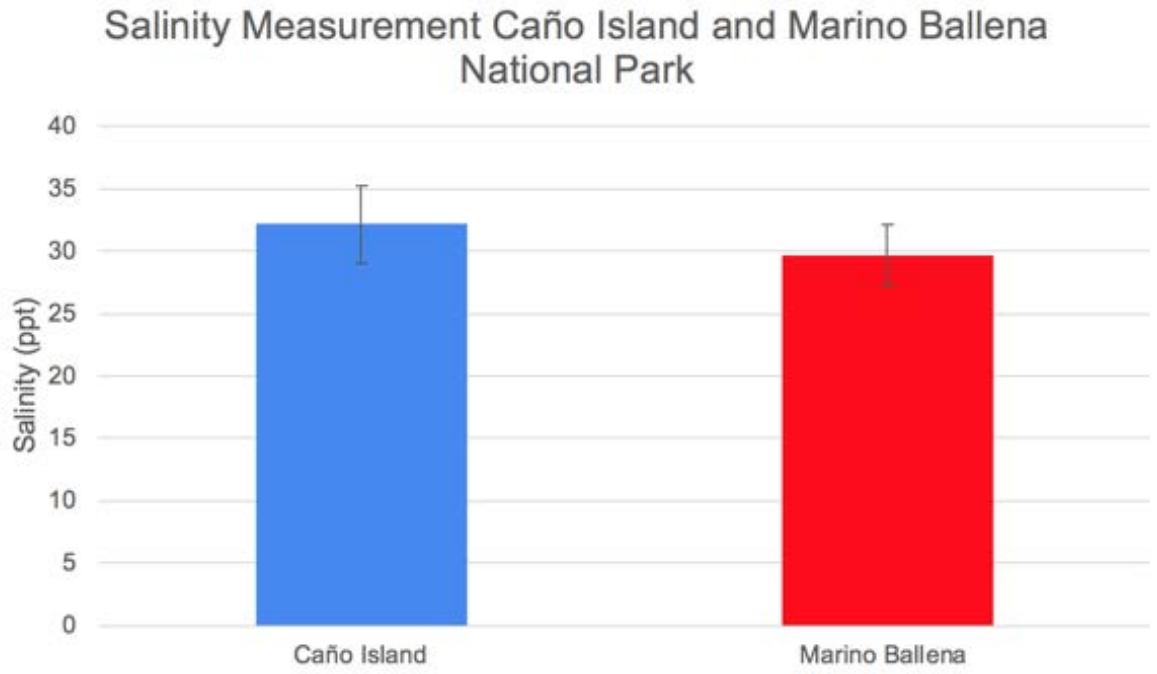
With the INMOLO project we have inventory marine invertebrate species around Caño Island Biological Reserve and Marino Ballena National Park, recording a total of 1165 observations of over 135 species from eight different invertebrate phyla: Arthropoda, Nemertea, Cnidaria, Mollusca, Platyhelminthes, Porifera, Annelida and Echinodermata. In those species, we have been able to identify 12 species that had never been reported before in the area; while most species haven't been yet evaluated by the IUCN, two of the 12 species newly reported were described as Vulnerable by the IUCN Red List of Threatened Species: *Polycyathus Isabela* and

Cycloseris curvata. Creating an inventory of understudied areas is crucial for an effective conservation strategy for an ecosystem. Without knowing which species exist in an area and their abundance, we cannot properly design and implement a plan. Furthermore we compared our observations at both field sites and we observed that the majority of species were found in both sites, with the exception of 11 species of sponges, nudibranchs, crabs, and shells, that were only observed in Marino Ballena National Park.

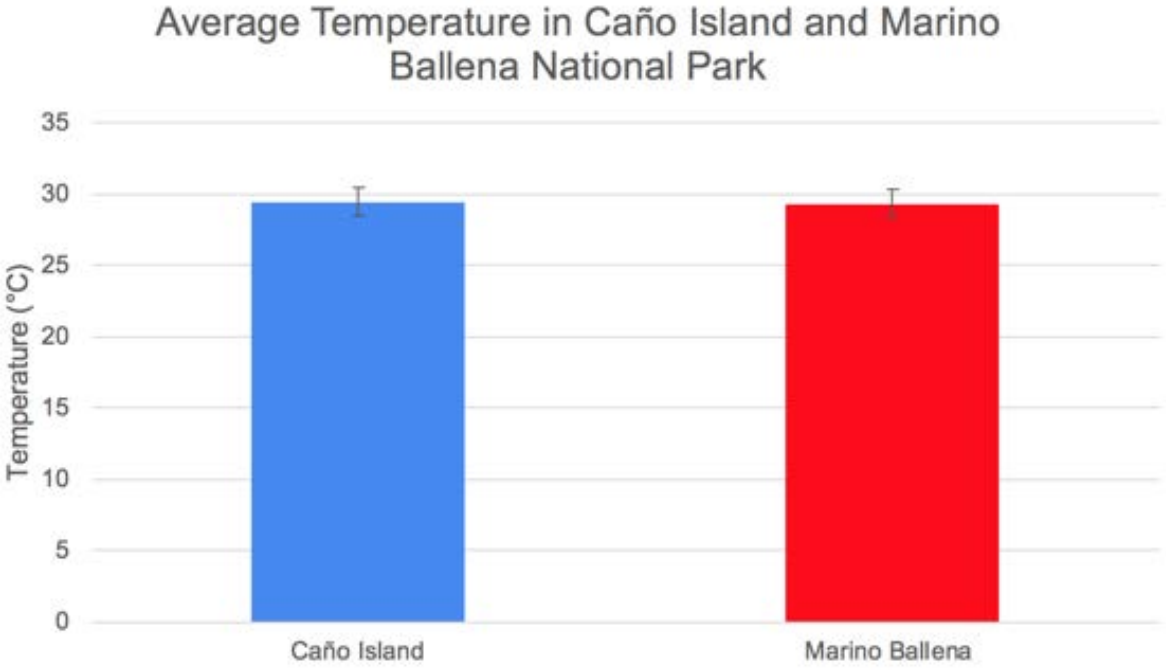
Water quality parameters have also been studied in both sites. With a total of 21 water samples analysed, we have recorded the pH, salinity, phosphates, nitrates, temperature, visibility and calcium concentration through time and space. Studying water quality parameters is crucial as they are directly linked to the health and dynamics of the ecosystem, as well as marine invertebrates' population. Results are shown in the next charts. Nitrates have not been found in any water sample analysed, which is a positive indicator of ecosystem health. Further studies are important both to create a larger data set and in order to record year-round seasonal effects on water quality parameters.



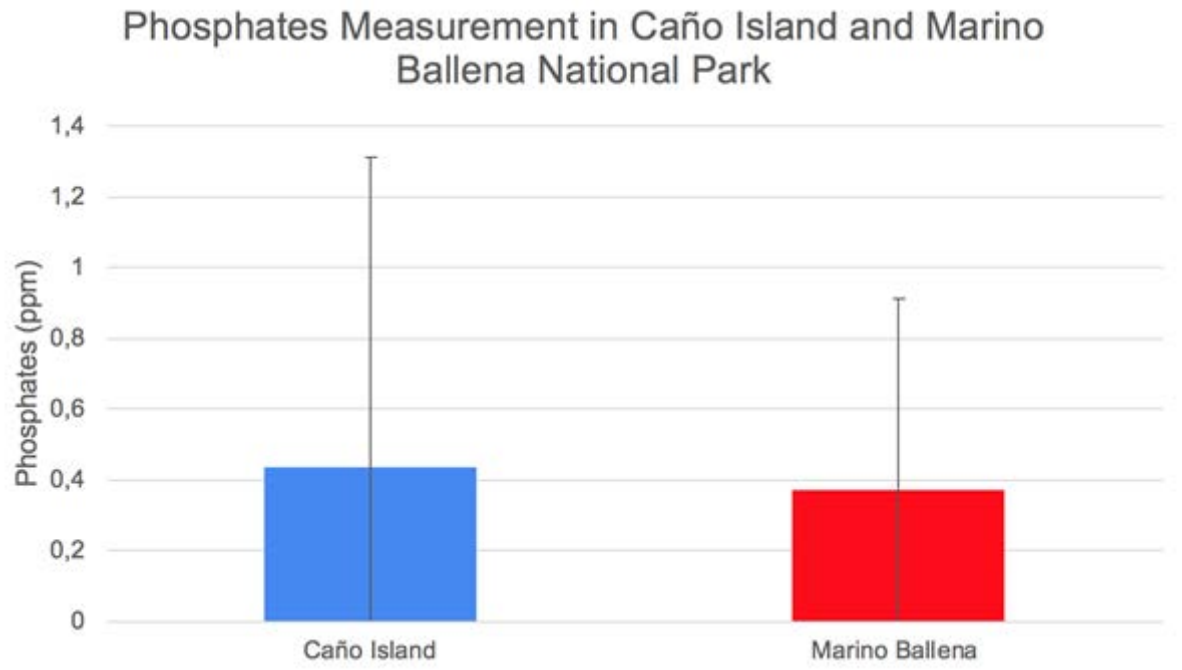
pH levels in both sites were very similar and very good as it should usually be around 8.1



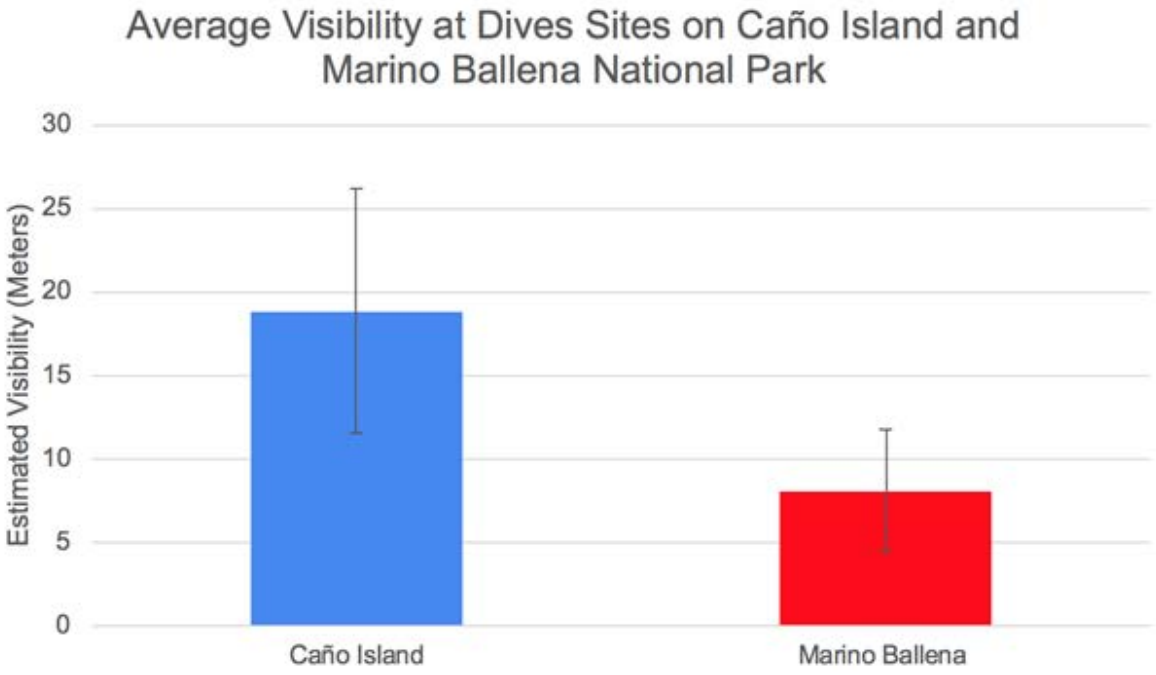
We observed low salinity levels after heavy rains. Also, Marino Ballena National Park tends to have lower salinity levels as it receives a lot of influence from the Sierpe River.



Temperature was very similar between both sites, with an average of 29°C.

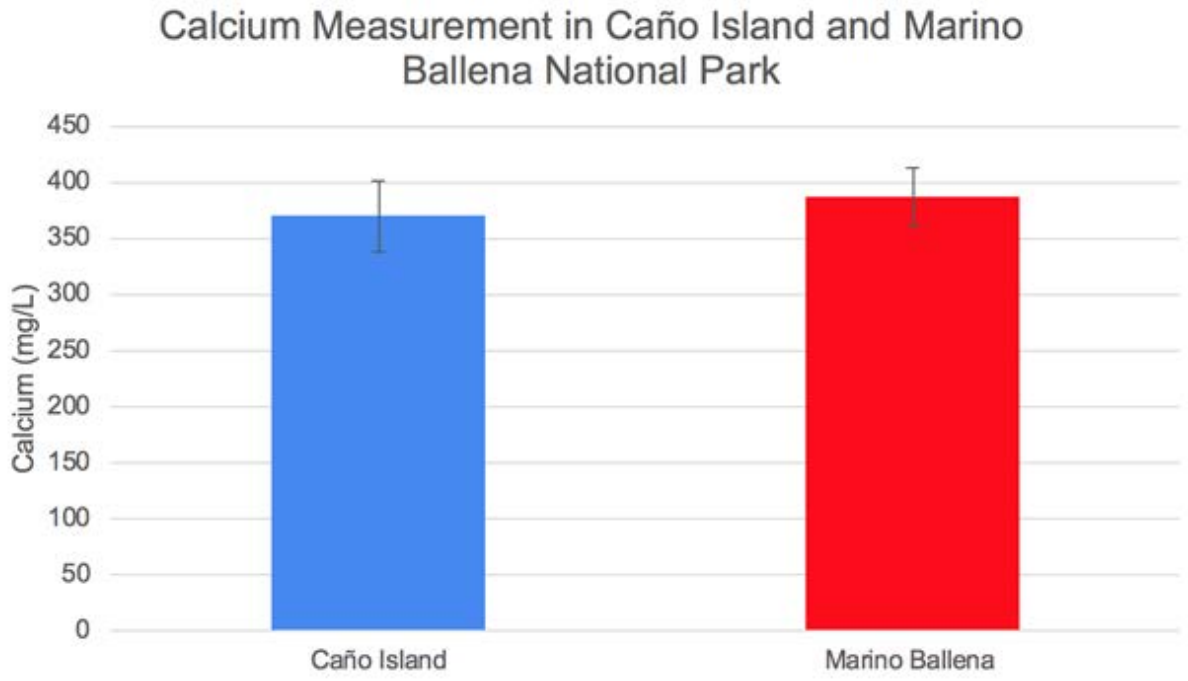


Phosphates have been observed in Marino Ballena National Park close to the river's mouth. Nevertheless, we were surprised to find phosphates in high quantities around Caño Island as well. This could be due to the natural composition of the rocks on the Island. Further studies should be done to confirm this hypothesis. As observed on this chart, standard deviation was very high as phosphate concentration varies highly every day in response to many factors (rain, currents, depth, etc.)



Visibility has been found to be related to invertebrates' presence. Indeed, when visibility is low, invertebrates tend to come out of their hidden place and can be observed easily. Due to high sedimentation and river influence, Marino Ballena

National Park has a lower visibility, explaining in part why many corals are today dead as they can't access the light necessary; but also explaining why it is easier to observe high abundance of some invertebrate species like sea stars, nudibranchs, octocorals, sea urchins, octopuses, etc.



Normal calcium concentration in the ocean should be around 410 mg/l in order to allow corals and invertebrates to build their calcium carbonate skeleton or shell. Concentration observed in both sites has been normal.

2. *Involving the local community.*

Innoceana's work on community outreach and engaging local stakeholders has been a particularly successful facet of this project. Through a total of 12 lectures in dive centres and community centres of Uvita, Sierpe and Drake, we have explained the importance of marine invertebrates and how everyone could get involved, by sending observations and pictures through an online form. Various observations and many pictures were received from over 20 people and two collaborative books were created. These books utilised pictures and observations taken by our volunteers. Volunteers who helped the project had the opportunity to be personally credited in the book for their observations. Those books have been printed and are available at the entrance of both Caño Island and Marino Ballena National Park. Moreover, the digital versions of the books have been sent to all participants of the online webinars.

We are proud to have received many positive comments from local and international scientists or non-scientists, concerning the quality of the books, the information they hold, and the new reports of species. We have also been able to observe an increased interest in marine invertebrates inside the community after attending one of our talks or reading the INMOLO books.

3. *New conservation measures induced.*

In Marino Ballena National Park, a tombolo (natural formation, sandy isthmus), called the Whale Tail, is highly visited when the park is open and visitors walk on the rocks covered in shells and molluscs, disturbing the ecosystem and breaking hundreds of shells. Thanks to the INMOLO project, the administration of the national park contacted us to help them assess the tombolo after 3 months of shutdown. We inventoried species, abundance and health on the Whale Tail without tourism. This led us to the conclusion that tourism had a negative impact on molluscs' population (in particular species of *Littorinidae*, *Nerita scabricosta* and *Tetraclita* sp). Thanks to the data collected, the national park decided to close the access to the rocky part of the Tombolo in order to protect species affected.

Tombolo of Marino Ballena National Park. Rocky area (after the red line) closed to the public following the INMOLO inventory. (Source: ballenainfocenter.com)

The INMOLO project has also enabled the increased awareness of endangered species, especially the highly locally endangered Cambute or *Lobatus galeatus*. Since the start of the project, local rangers have received more notifications than ever of illegal fishing of Cambutes and have taken measures to arrest those responsible.

On Caño Island, rangers have been working for more than 2 years without a boat. Without a boat they were unable to patrol and control illegal fishing around the island, they were also unable to leave the island for any type of emergency, until a tourism boat arrived. With the INMOLO project, we have been pushing the authorities to bring a boat to the Island and enable the rangers to work under better conditions and protect the Island in a more efficient way. In May 2020, after multiple talks, emails and meetings, the rangers finally received two boats to patrol the Island.

Finally, coral protection has been reinforced: local guides have now decided to include in their daily briefing about corals, its importance, its threats, and why it is important not to touch it. Indeed, many tourists treat corals as rocks because they are not aware of the coral biology and ecology. The SINAC (National System of Conservation Areas) has also been pushing for and encouraging the start of the project of coral restoration in Marino Ballena National Park following Innoceana's report on the water quality data of the park. In particular the report has allowed the specification of potential nursery sites inside the national park.

4. Briefly describe the involvement of local communities and how they have benefitted from the project.

INMOLO has actively involved the local community over the duration of the project by encouraging them to participate in this citizen science initiative through the online invertebrate identification form. More than 100 people including rangers, dive centres and kids have been actively participating in the INMOLO project. The creation of the books for marine invertebrate species including pictures of local participants and their corresponding name has brought recognition for their involvement. Being part of the conservation of their own environment motivates the community to learn and care more about the ocean. This project allowed them to be more aware of their environment and discover species they had never seen or imagined before. It has encouraged them to protect and care for marine invertebrates as much as they would for more well-known species like whales or turtles.

Being the first initiative in the area focused on marine invertebrates and involving local communities, the INMOLO project has created material and data that are accessible and understandable for scientists and the larger community. Multiple modes of communication and outreach have been created including collaborative books, posters, identification leaflets, and articles (Annex 1,2,3,5,6); posters explaining the project are displayed in Caño Island and in the national park, an Identification fiche with 42 species of important marine invertebrates has been created for Marino Ballena National Park (Annex 10), an article on INMOLO project has been published in Ballena Tales magazine (Annex 4), and another article on INMOLO will be published in January 2021 in Jungle Magazine.

Finally, the multiple online webinars hosted during the pandemic allowed us to reach 604 people from all over the world. In-person seminars were also done in Costa Rica, to share the work that is happening in Caño Island and Marino Ballena National Park. This has been increasing the interest in people, locals and foreigners, to visit these conservation sites and potentially participate in the project; indirectly benefiting the local tourism economy.

5. Are there any plans to continue this work?

Yes. INMOLO is more than a project, it's a concept. Indeed, this collaborative inventory can be replicated anywhere around the world, as long as there are invertebrates and a local community eager to learn more about their environment. Given the success of the first INMOLO project in the south Pacific of Costa Rica, we plan to repeat it in other areas, involving different communities.

In September 2020, we had the chance to meet a passionate community in the Caribbean coast of Costa Rica, between Cahuita and Puerto Viejo. As part of a 5-day coral training designed and given by Innoceana to the young local community trained by a local diving centre, we have had the chance to introduce the INMOLO project. We have received a great enthusiasm from instructors, as well as from the young divers (12-19 years old), eager to learn and protect their cherished marine ecosystem. After 5 days of theory classes and underwater exploration, they

discovered species they had never seen before and expressed their desire to start an INMOLO inventory with Innoceana.

Online webinars hosted during the COVID19 pandemic also arose interest in various people around the world. We have indeed received multiple requests to start INMOLO project in other places of the world as Ecuador, Sri Lanka, or New Zealand.

6. How do you plan to share the results of your work with others?

With the INMOLO books, in their printed form as well as digital (https://innoceana.org/inmolo/), we have already been sharing species found, their importance for the ecosystem and pictures taken by the Innoceana team and the local community. Online webinars and talks given internationally as well as to the local community have also allowed us to share the results of our work with more than 604 people.

Reports have already been written and shared with the SINAC (National System of Conservation Areas) and the Environmental Ministry of Costa Rica. Indeed, reports of water quality parameters and of the inventory of marine invertebrate species, including hard corals, have already helped in implementing conservation measures like the protection of the tombolo in the national park and have supported the start of the coral restoration project in Marino Ballena.

Moreover, we are working on sharing the database of our 1165 observations of marine invertebrates. After investigation and multiple meetings with various platforms, we have chosen to share our data on BIODATACR as it is the most suitable platform for the particular project. BIODATACR is a new Costa Rican platform created by CONAGEBIO and the local government in order to systemise information and data on Costa Rican biodiversity. https://biodiversidad.go.cr/wordpress/

It is a very new platform and online database, but considerable amounts of new data and information should be uploaded before the end of the year by various organisations and national universities. We are working on converting our database into the BIODATACR format and will be able to upload all the data on the platform before February 2021.

Observations and scientific data on marine invertebrates are quite rare and BIODATACR has expressed considerable interest in our data. This data may help scientists in their research and will also bring extremely valuable information to the government for conservation measures.

We are also planning on publishing the new reports of marine invertebrates that had never been observed previously in the studied areas. We have already shared our observations with Dr Karol Ulate Naranjo, head of the marine biology department at the UNA (National University of Costa Rica), specialised in soft corals and invertebrates. She expressed her keen interest in our work and proposed her help in publishing the new reports in scientific reviews or magazines.

Finally, the project's results have already been shared on our website. We are also very active on social media, sharing the books and information on marine

invertebrate species on Facebook, Instagram and Twitter. Articles in local magazines have also been written, explaining the project and sharing the books.

7. Timescale: Over what period was the grant used? How does this compare to the anticipated or actual length of the project?

The grant was planned to be used for field work for a period of 3 months before June 2020 (before the rainy season). We started the project in February 2020 and were able to complete the inventory of Caño Island Biological Reserve and to start the inventory in Marino Ballena National Park before mid-March 2020. We then had to interrupt our field work because of the COVID19 pandemic. We then adapted to the situation and worked exclusively from our computer, writing most of the books, identifying species, and organising online webinars to share the project and raise awareness about marine invertebrate importance.

We were authorised to go back to the field and continue monitoring Marino Ballena National Park from July to August 2020. Despite the rainy season and rough weather conditions, we have worked hard to be able to complete both inventories and engage the local community in our efforts.

8. Budget: Provide a breakdown of budgeted versus actual expenditure and the reasons for any differences. All figures should be in £ sterling, indicating the local exchange rate used. It is important that you retain the management accounts and all paid invoices relating to the project for at least 2 years as these may be required for inspection at our discretion.

Item	Budgeted Amount	Actual Amount	Difference	Comments
INMOLO book printing (2)	154	193	+39	
Personal expenses : Food	1078	1547	+469	As Project has been extended due to COVID19, food expenses have been greater.
Water Quality study kit	208	218	+10	
UV dive light	108	84	-24	
External Hard drive	77	67	-10	
Underwater camera	539	522	-17	
Boat and equipment for Caño Island	2279	2279		

Boat and equipment for Marino Ballena National Park	1540	1155	-385	Boat has been rented only 6 days (instead of 8), due to COVID19 and bad weather conditions.
TOTAL	**5983**	**6065**	**+82**	Local exchange rate used: 1 USD = 0,77 £ sterling

9. Looking ahead, what do you feel are the important next steps?

In the upcoming months, I will be working on converting the database into the BIODATACR platform format. Data will be uploaded with the help of BIODATACR staff. One caveat regarding the uploading of data, care will be made to not disclose the GPS location of species currently subject to poaching, for example *Lobatus galeatus* (Cambute), as poachers might use the data to illegally take these species.

Before the end of 2020, we will also write and apply for permits to start INMOLO in the Caribbean coast of Costa Rica. We have received a high interest from the community in starting the project there. Luckily, we have already good connections with the SINAC, the rangers of Cahuita National Park, and the local community which all support the permit application. We will then apply for the 2nd Rufford Foundation Grant in order to continue and expand the project.

We believe the expansion of INMOLO in the Caribbean coast will be involving a large local community that has much more decision-making influence than in the south Pacific of Costa Rica. Indeed, the Cahuita National Park is the only park of Costa Rica that is co-governed by the SINAC and the community, involving locals in the decision-making process and implementation of conservation measures. The project will bring precious data and information essential to conserve their ecosystem.

Finally, we think it is important to work on publishing the new reports of species made around Cano Island and Marino Ballena National Park as it would be precious information for the scientific community.

10. Did you use The Rufford Foundation logo in any materials produced in relation to this project? Did the Foundation receive any publicity during the course of your work?

Yes. The Rufford Foundation logo has been used in all the presentations, online webinars, and talks we have given since February 2020. We have thereby talked about Rufford Foundation and expressed our gratitude for its support to over 604 people as part of presentations/talks.

It has also been used on the posters created about the project.

The logo can also be found on our website under the INMOLO project page.

11. Please provide a full list of all the members of your team and briefly what was their role in the project.

Carlos Mallo Molina: director of Innoceana, he has been an advisor during the whole project, has been monitoring also on the field and gave talks and presentations along with Laura.

Pamela Morales Loria: has been in charge of logistics in all the talks and presentations to the community. She also has been writing the Spanish translations for both books.

Olger Chavarria: ranger of Cano Island Biological Reserve, he has been monitoring each day with the team, taking pictures and helping in the identification of species.

Alcides Berrocal: ranger of Cano Island Biological Reserve, he has been monitoring each day with the team, taking pictures and helping in the identification of species.

Cristian Masis Sanchez: Administrator of Marino Ballena National Park, he has been helping us with logistics to monitor the National Park, as well as identification of species.

Julia Zafra: Marine Biologist, she has been monitoring along with the team, taking pictures. She also helped write species in the books.

Margot Deville: Volunteer with Innoceana, she helped monitor the National Park and wrote species in the books as well.

Maggie Seida: Volunteer with Innoceana and biologist, she helped with the statistical analysis of the results.

Annexes below :

Annex 1: INMOLO Project Poster
Annex 2: Annoncement for the release of the INMOLO book
Annex 3: Poster printed INMOLO Book in Cano Island
Annex 4: Ballena Tales Magazine Article : https://www.ballenatales.com/inmolo-innoceana-2/
Annex 5: Coral taxonomy field guide front & back page
Annex 6: Online Webinars Series Posters
Annex 7: Online Webinar for INMOLO and Climate Change
Annex 8: Online Webinar Series Schedule
Annex 9: Identification Cards of Marine Invertebrates for Marino Ballena National Park
Annex 10: New species observed per week of field work on Cano Island, represented on a linear regression model.
Annex 11: New species observed per week of field work in Marino Ballena National Park, represented on a linear regression model.

INNOCEANA PRESENTS

INMOLO

INMOLO or "Invertebrates Monitoring and Localization" study on Caño Island. Through the creation of a collaborative book, an online database and a shell exhibition we want to raise awareness on the importance of invertebrates for the ocean ecosystem and survival.

Monitoreo y localización de invertebrados en la Isla del Caño. Mediante la creación de un libro colaborativo, una base de datos online y una exposición de conchas, queremos generar conciencia sobre la importancia de los invertebrados para el ecosistema marino y su supervivencia.

READ THE BOOK HERE
LEE EL LIBRO AQUÍ

Scan me

https://innoceana.org/en/2019/08/21/inmolo-project/

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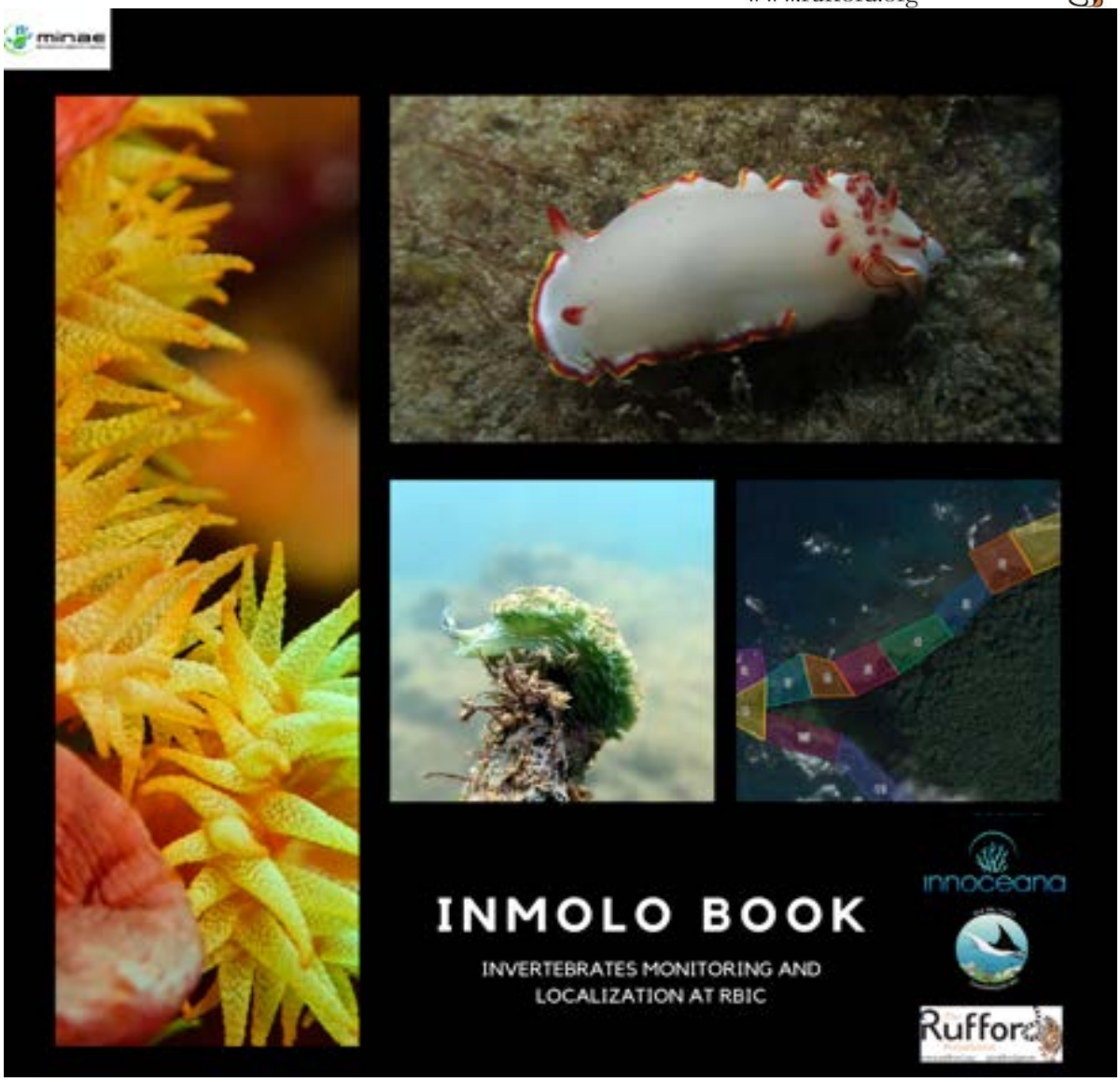
Rufford


INMOLO BOOK
INVERTEBRATES MONITORING AND
LOCALIZATION AT RBIC
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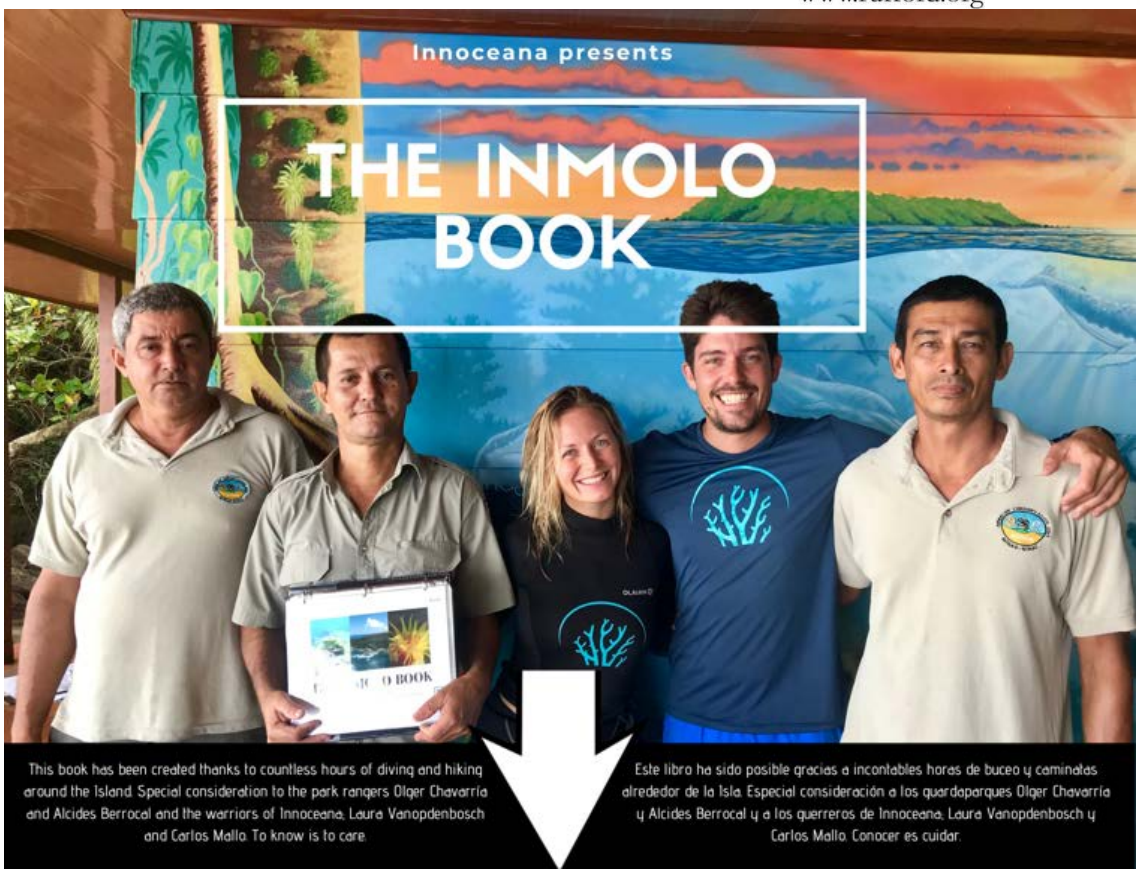
Innoceana presents
THE INMOLO BOOK
This book has been created thanks to countless hours of diving and hiking around the Island. Special consideration to the park rangers Olger Chavarría and Alcides Berrocal and the warriors of Innoceana; Laura Vanopdenbosch and Carlos Mallo. To know is to care.
Este libro ha sido posible gracias a incontables horas de buceo y caminatas alrededor de la Isla. Especial consideración a los guardaparques Olger Chavarría y Alcides Berrocal y a los querreros de Innoceana; Laura Vanopdenbosch y Carlos Mallo. Conocer es cuidar.


ENVIRONMENT - UVITA Y ALREDEDORES
innoceana
THE RACE TO SAVE OUR OCEANS
AUTHOR: LAURA VANOPDENBOSCH
Innoceana is an international Marine Conservation NGO. It has been working in the Pacific South of Costa Rica for the past two years. The team is composed of engineers and biologists whose aims are to protect the Ocean through Innovation and Education. They have created various research projects worldwide in places like Thailand, Indonesia, Spain, California, and Costa Rica. With a focus on coral reefs, seagrass, water quality, and endangered marine species.
Innoceana believes that Education is the key to making a real change in protecting the Ocean. This is why every project involves collaboration and engagement through Citizen science. (CS, also known as community science, crowd science, crowd-sourced science, civic science, volunteer monitoring, or online citizen science) is scientific research conducted, in whole or in part, by amateur (or nonprofessional) scientists.)
Today we will describe the INMOLO project: IN vertebrate MO-nitoring and LO-cation. This collaborative inventory of marine invertebrates was launched a year ago on Caño Island with the indispensable support of SINAC's local park rangers. Invertebrates are essential to the ecosystem, and unfortunately poorly studied. They represent 97% of all animals, are the base of most food webs, and are used for medical purposes. Without invertebrates, the whole ecosystem would collapse.
INMOLO was created to study the invertebrate populations of Caño Island, their abundance, health, and awareness of the importance of marine invertebrates for the environment's health.
After a year working alongside the rangers of Caño Island, tour operators and local guides, Innoceana has recorded 95 species of marine invertebrates and reported more than 12.000 individuals. We made observations walking around the Island, snorkeling, and scuba diving. Eight species never observed on the Island before have also been reported for the first time.
The team is creating a collaborative book about all the species observed on the Island. The book displays pictures and observations taken by the local community and explains the ecological importance and distribution of each species.
With the participation and engagement of the local community, INMOLO has succeeded in raising awareness about the importance of marine invertebrates, their role, and their conservation. Cambutes or Giant Conch (Lobatus galeatus), are a critically endangered species in Costa Rica because, among others, they are highly appreciated for ceviche (marinated seafood). With INMOLO, we raised awareness concerning their vulnerability, and as a result, illegal fishing of the species has decreased.
Our ambition is that INMOLO will be more than a single project. Innoceana's goal is to replicate the INMOLO concept around the world, starting first of all with the National Park Marino Ballena.
DOWNLOAD THE BOOK
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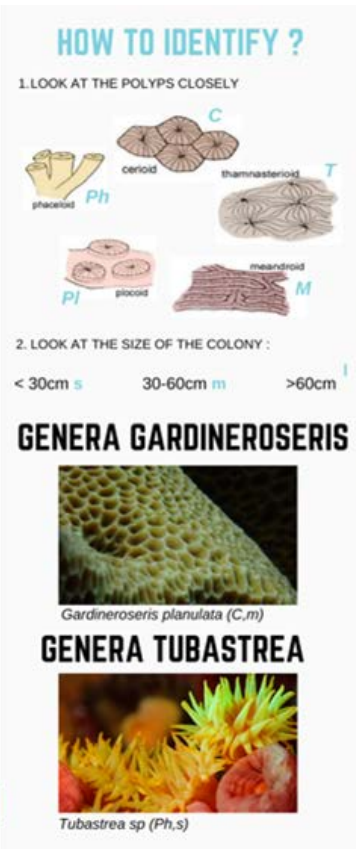
"ICE AGES HAVE COME AND GONE. CORAL REEFS HAVE PERSISTED."
SILVIA EARLE
HARD CORALS OF SOUTH COSTA-RICAN PACIFIC
The field guide
FOR MORE INFORMATION ABOUT OUR PROJECTS
WWW.INNOCEANA.ORG
info@innoceana.com
CORAL REEFS COULD BE GONE IN 30 YEARS (NATGEO)
innoceana


GENERA PSAMMOCORA
Psammocora stellata (T,s)
Psammocora proundacella (M,m)
GENERA PAVONA
Pavona duerdeni (T,l)
Pavona gigantea (T,l)
Pavona chiriquiensis (T,m)
Pavona maldivensis (Pl,m)
Pavona varians (M,m)
Pavona clavus (T,l)


HOW TO IDENTIFY ?
1.LOOK AT THE POLYPS CLOSELY
C
cerioid
thamnasterioid
T
phaceloid
Ph
meandroid
M
Pl
plocoid
2. LOOK AT THE SIZE OF THE COLONY :
< 30cm s
30-60cm m
>60cm l
GENERA GARDINEROSERIS
Gardineroseris planulata (C,m)
GENERA TUBASTREA
Tubastrea sp (Ph,s)


GENERA POCCILOPORA
Branching coral with polyps grouped into verrucae
Pocillopora capitata
Pocillopora eydouxi
Pocillopora damicornis
Pocillopora elegans
Pocillopora meandrina
Pocillopora verrucosa
GENERA PORITES
Porites lobata (C,l)
Porites panamensis (C,l)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JUNE
MON 1ST
WATER QUALITY ELEMENTS
JUNE
WED 3RD
MICRO PLASTICS
JUNE
FRI 5TH
INMOLO
INVERTS MONITORING & LOCATION
TUNE IN TO LEARN ABOUT OUR PROJECTS
6:00 PM GMT+2 (MADRID) IN ENGLISH
JUNE
TUE 9TH
INNOMAPAS
SEAGRASS MAPPING
JUNE
THU 11TH
THE CRYSTAL FLOOR
CORAL 3D MODELS


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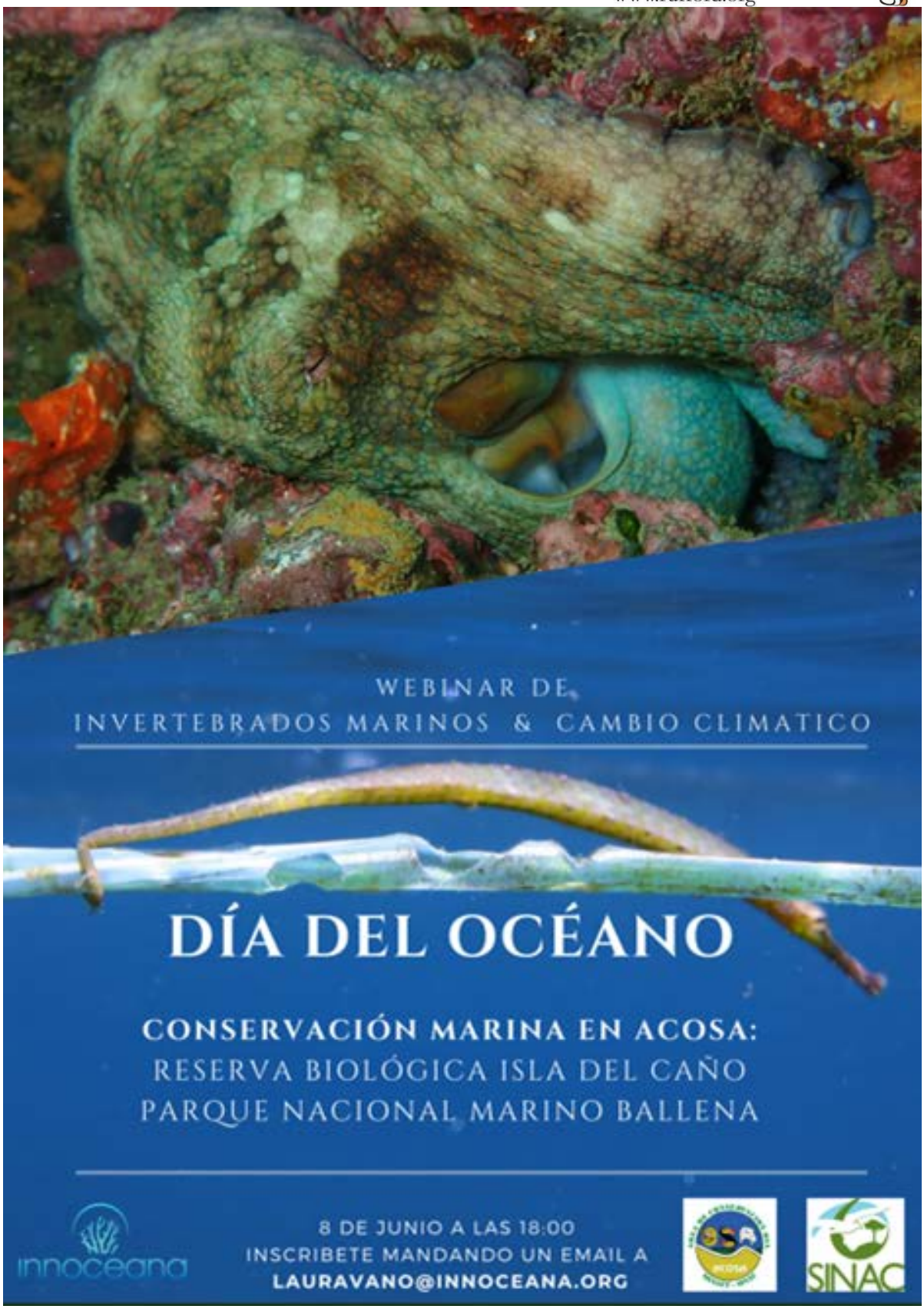
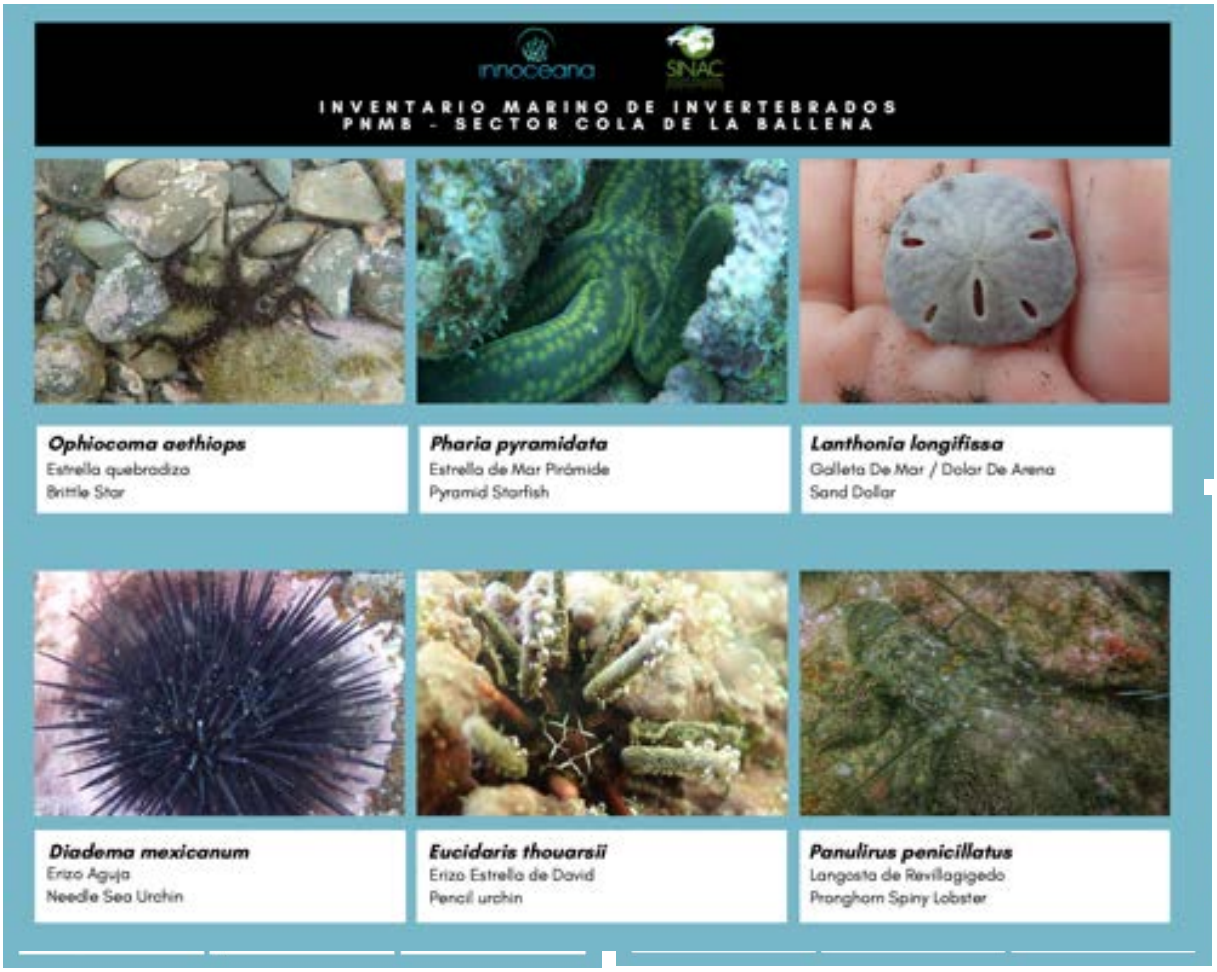
APRIL
13
WEBINAR
INMOLO
INVERTEBRATES MONITORING
LAURA VANOPDENBOSCH
COSTA RICA PROJECT MANAGER
SINAC


WEBINAR DE
INVERTEBRADOS MARINOS & CAMBIO CLIMATICO
DÍA DEL OCÉANO
CONSERVACIÓN MARINA EN ACOSA:
RESERVA BIOLÓGICA ISLA DEL CAÑO
PARQUE NACIONAL MARINO BALLENA
innoceana
8 DE JUNIO A LAS 18:00
INSCRIBETE MANDANDO UN EMAIL A
LAURAVANO@INNOCEANA.ORG
SINAC


innoceana live!
JUNE WEBINAR SERIES
6:00 PM GMT+2 (MADRID TIME ZONE)
JUNE 1
WATER QUALITY ELEMENTS
Want to learn about the importance of the water in marine ecosystems? This is the project that got Innoceana started. Designed and developped in Thailand, it travelled the world and now generates data from Indonesia, Costa Rica and Tenerife as well.
CARLOS, INNOCEANA CEO
JUNE 3
MICROPLASTICS
How much do you know about microplastics (MPs)? In collaboration with the University of La Laguna, our team is leading talks and workshops to raise awareness about this global issue. Find out where MPs come from and why they are such a threat.
ALE, MP PROJECT MANAGER, TENERIFE
JUNE 5
INMOLO
Invertebrates represent 97% of all animals and are at the base of most foodwebs. Studying them can tell us a lot about the health of aquatic ecosystems and help us raise awareness about conservation issues.
LAURA, COSTA RICA PROJECT MANAGER
JUNE 9
INNOMAPAS
Did you know seagrasses are true ocean engineers and are essential to marine ecosystems? Still, most of us know very little about them. Innomapas was designed in Tenerife to bring people to the local seagrass, and seagrass to people.
ISA, TENERIFE PROJECT MANAGER
JUNE 11
THE CRYSTAL FLOOR (3D MODELS)
If the crystal ball tells you about your future, the state of corals can definitely tell us about the oceans future. The crystal floor is a gallery of coral 3D models created to monitor changes in coral reefs.
CARLOS, INNOCEANA CEO
SIGN UP NOW FOR THE WHOLE SERIES AND GET
YOUR CERTIFICATE OF COMPLETION
DELIVERED BY INNOCEANA
EMAIL US AT ISAPEETERS@INNOCEANA.ORG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INVENTARIO MARINO DE INVERTEBRADOS
PNMB - SECTOR COLA DE LA BALLENA
Ophiocoma aethiops
Estrella quebradiza
Brittle Star
Pharia pyramidata
Estrella de Mar Pirámide
Pyramid Starfish
Lanthonia longifissa
Galleta De Mar / Dolar De Arena
Sand Dollar
Diadema mexicanum
Erizo Aguja
Needle Sea Urchin
Eucidaris thouarsii
Erizo Estrella de David
Pencil urchin
Panulirus penicillatus
Langosta de Revillagigedo
Pronghorn Spiny Lobster


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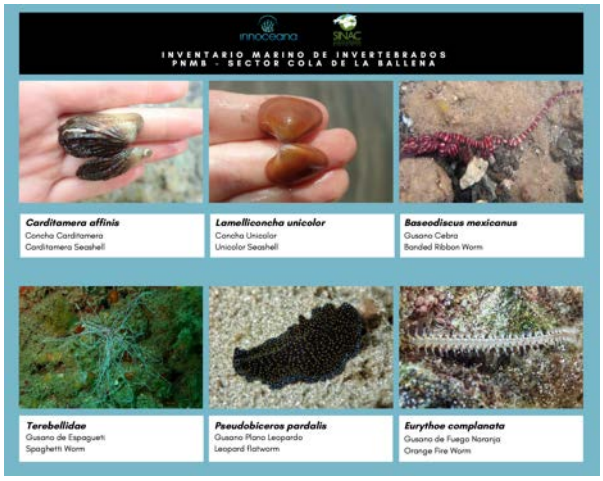
Lobatus galeatus
Cambute
Giant Conch
Fissurellidae
Lapas de Cerradura y de Abertura
Keyhole Limpets
Siphonaria gigas
Casco de Burro
Giant False Limpet
Tetraclita stalactifera
Lapas de cerradura
Barnacle
Littorinidae
Bigaros
Periwinkles
Tivela byronensis
Tivela de Byron
Byron Tivela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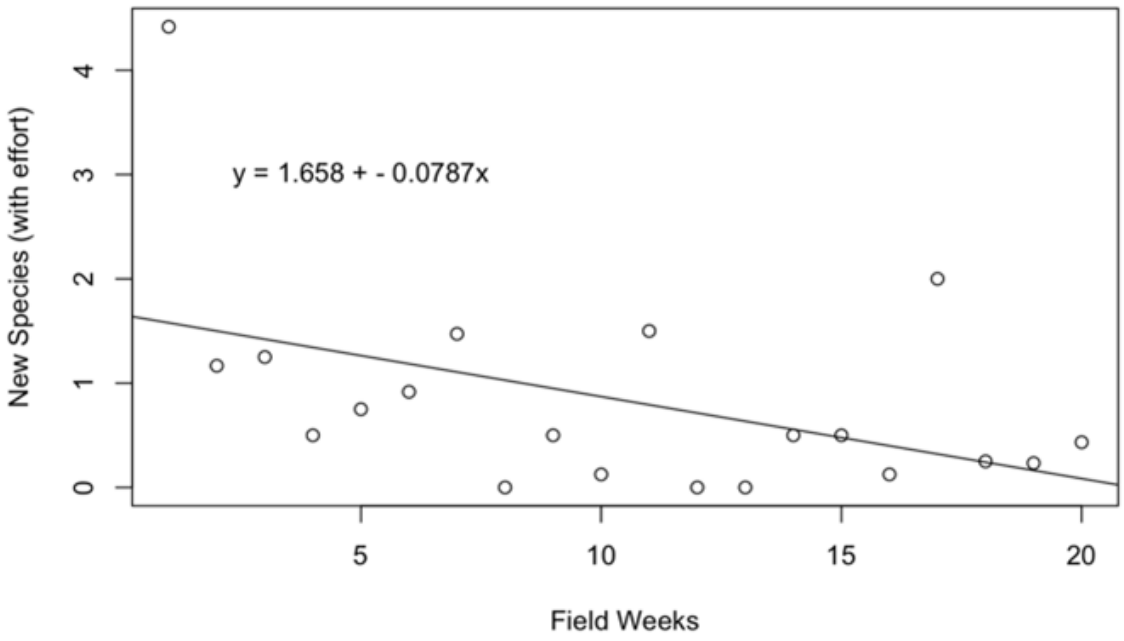
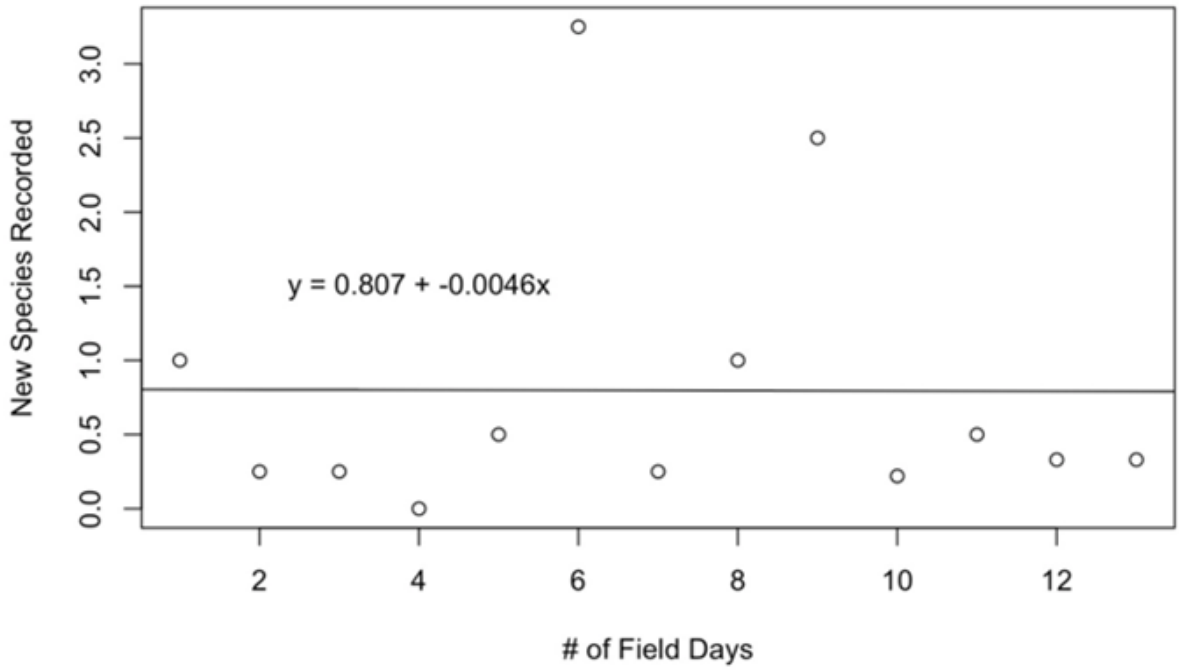
INVENTARIO MARINO DE INVERTEBRADOS
PNMB - SECTOR COLA DE LA BALLENA
Carditamera affinis
Concha Carditamera
Carditamera Seashell
Lamelliconcha unicolor
Concha Unicolor
Unicolor Seashell
Baseodiscus mexicanus
Gusano Cebra
Banded Ribbon Worm
Terebellidae
Gusano de Espagueti
Spaghetti Worm
Pseudobiceros pardalis
Gusano Plano Leopardo
Leopard flatworm
Eurythoe complanata
Gusano de Fuego Naranja
Orange Fire Worm

Statistical analysis has been carried out in order to assess the success of both inventories. To do so we have hypothesised that less new species would be observed with time, represented by a linear regression model.



New species observed per week of field work on Cano Island, represented on a linear regression model. Effort was considered as dive hours. The slope has a coefficient of -0.0787 showing that there is no significant linear correlation. This could be explained by various hypothesis:

- As it is the first year of the INMOLO project, the team has been learning everyday how to best find marine invertebrates and has been more efficient with time in discovering new species on the field. This is of course against our first hypothesis implying that less new species would be observed with time.
- As a citizen science project, involving the local community made it more complicated to assess the exact effort for each field workday. Training the local community to find marine invertebrates for 1-hour dive didn't have the same result as 1-hour dive with the scientific team only. This is why we considered weeks of field work and not days (including weeks of the pilot project in 2019).
- Finally, more weeks of field work would have been required in order to observe a more significant linear regression.



New species observed per week of field work in Marino Ballena National Park, represented on a linear regression model. Effort was considered as dive hours. The slope has a coefficient of -0.0046 showing that there is no significant linear correlation. This could be explained by the same hypothesis as above. Moreover, less days have been spent on the field in the national park, due to the COVID19 lockdown and because no pilot study had been conducted beforehand.