

**EXPEDITION REPORT**  
**SIERRA LA LAGUNA BIOSPHERE RESERVE-**  
**SIERRA LA TRINIDAD - CABO PULMO NATIONAL PARK**

# WATER ROADS



**THROUGH THE WATERSHEDS FROM THE EAST CAPE**  
**MARCH 21-24 / 28-31, 2019**

**Baja Coastal Institute**

With the valuable support from Santiago and Los Planes Highschools, Secretary of Public Education, Monterey Bay Aquarium, University of Baja California Sur, Ecology Project International, Amigos para la Conservación de Cabo Pulmo, Baja Biosana, Rancho Buena Fortuna, Baja Sierra Adventures and our good friend Marta Sara.

## Program description

**Education to Action**, aims to offer training, outdoor educational experiences and project-based learning to teachers and students of high schools in the East Cape region. In this way, young people who are a few years away from being the next leaders are activated to improve the conditions of their communities and promote the conservation of their natural environment.

This is a program of the Baja Coastal Institute in collaboration with the Secretary of Public Education, the Monterey Bay Aquarium and other local institutions and organizations, with the BCS Colleges of Scientific and Technological Studies of Los Planes and Santiago serving about 1,000 young high-school students from 27 communities and ranches in the East Cape region in Baja California Sur.

This report is about two expeditions with 24 students and 6 teachers from 10 different communities of Cabo del Este, who traveled the Santiago and Cabo Pulmo basins for four days; crossing two of the most pristine and most ecologically important areas of the southern peninsula: the Sierra la Laguna Biosphere Reserve and Cabo Pulmo National Park, both recognized as World Heritage by UNESCO.

During these expeditions, we follow the natural course of water from the mountains to the sea. We camp in the Sierra de La Laguna, in the Sierra de La Trinidad and in Cabo Pulmo where we carry out various activities recording and understanding the different stages of the water process and its historical relationship with the ranches and communities of the area, their challenges and attributes of the region. The students had time to get to know each other, connect with nature and live in traditional ranches where they learned the historical relationship between Man - Water, its different uses, difficulties and threats, following its path from the mountains to the sea. In addition, students participated in a research on biodiversity associated with water and learned about the importance of these species as indicators of the quality of this vital liquid.



## General objective

To create awareness, inform and actively involve teachers and young people in the recognition of the natural and cultural heritage of the East Cape region through learning and coexistence experiences to inspire projects that benefit communities and the environment.

## Specific objectives

- To gather young people from different communities of Cabo del Este in an experiential experience in which they recognize the river basin in which they live and how their communities are connected and defined by water;
  - To know and use different technological tools for data management and communicate information;
  - To recognize the importance of the environmental services provided by the ecosystems that make up the basin, especially those of the Protected Natural Areas
  - To reflect on the threats to these resources by the growing real estate, tourism and the intention to establish mining projects in the area;
  - To experience scientific research applied to water quality and biodiversity associated;
  - To build an adobe oven and harvest reed as an example of the alternatives offered by the region's materials;
  - To promote cultural exchange, communication, teamwork and respect for life in all its forms;
- Inspire participants to take actions for the conservation of their natural space..

## Teachers

- Carlos Vicente Salgado (Highschool Santiago)
- Natalia Mendía (Highschool Los Planes)
- Benito Filemón Ramírez Álvarez (Highschool Los Planes)

## Facilitators

- Kenton Parker (Monterey Bay Aquarium)
- Alonso Mohedrano (Instructor Ecology Project International -EPI)
- Luciana Klinge (Instructor Ecology Project International - EPI)

## Leaders

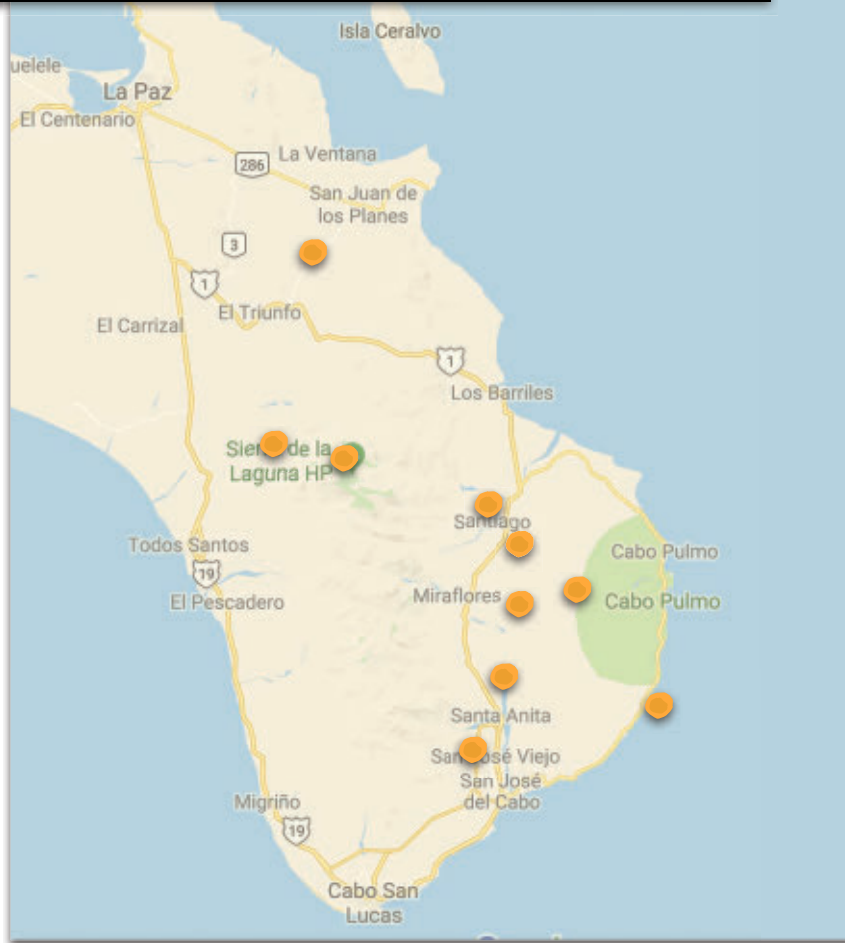
- Paulina Godoy Aguilar -Baja Coastal Institute
- Edgardo Cortes Nares - Baja Sierra Adventures Local company dedicated to rural tourism, education and adventure with more than 15 years of experience.

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\* Los facilitadores y responsables del campamento están certificados para disminuir riesgos y atender primeros auxilios en áreas remotas.



# WHERE THE STUDENTS CAME FROM



# OUR ROUTE



355km.in total





Where does the water come from?  
Where does the water go?  
How much is there and what is it used for?  
Water quality?  
Key actors  
Problems and risks

Throughout the expedition we were reflecting on these questions and then share our observations and reflections in this application: <https://app.agua.org.mx/>, a platform that offers an interactive map of all the basins of Mexico that allows the access of relevant information around the water where we live and encourages interaction for decision making.

# SIERRA LA LAGUNA BIOSPHERE RESERVE



## DAY I

DISTANCE  
TOTAL: 109 KM

Place	Activity	Objetive
Santiago Highschool	Team meeting, map presentation and basin model.	<ul style="list-style-type: none"> <li>• PRE Diagnostic</li> <li>• Recognize the watershed and our route</li> </ul>
To the ranch	Collect adobe and view of the watershed.	<ul style="list-style-type: none"> <li>• Visualize where the material for construction with materials from the region comes from and how the watershed is conformed.</li> </ul>
Las Vinoramas Ranch	Interview with Don Nacho, who has a ranch and an orchard in the foothills of the Sierra de La Laguna. Harvest of tomatoes.	<ul style="list-style-type: none"> <li>• Recognize the easy access to water that people living in the mountains have and how it makes a difference in defining their way of life.</li> </ul>
Water pools (cañón El Chorro)	Walk through Las Vinoramas, middle part of the mountain range to find a stream of crystalline water that descends from the high part and runs throughout the year. Swim, cool off and eat. Exploration of biological indicators of water.	<ul style="list-style-type: none"> <li>• Observe, listen Where does this water come from? What does it tell us?</li> <li>• Perform first Bioblitz on the life associated with water.</li> <li>• Know which species are indicators of water quality.</li> </ul>
To El Chorro	Back to the stream walking	<ul style="list-style-type: none"> <li>• Observe the community, recognize needs.</li> </ul>
Casa de Los Pájaros	Dinner. Campfire and theatrical performance (by Doña Marta). Reflection and camp.	<ul style="list-style-type: none"> <li>• Reflect on our role as young people in today and here. We own our lives.</li> <li>• Recapitulate what we did, what we liked and what we didn't. Closing of the day</li> </ul>





Interviewing Don Ignacio and harvesting tomatoes.



Recollecting adobe.



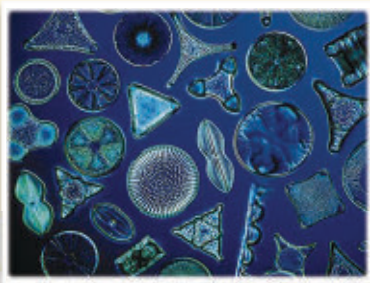
Walk from Las Vinoramas Ranch to the water pools.



# DOCUMENTING LIFE ASSOCIATED TO WATER



In the pools we take diatomaceous samples, microalgae that are indicative of water quality.





# BioBlitz



**iNaturalist.org**

**NATIONAL  
GEOGRAPHIC**



A Bioblitz is a participatory citizen science event where the objective is to register as many species as possible in a place and during a certain time. Using technologies and applications such as iNaturalist (Naturalist), in cell phones or tablets, Bioblitz are used to document and become aware of the biodiversity that exists in an ecosystem. High-quality data uploaded to iNaturalist becomes part of the Global Biodiversity Information Facility, an open source database used by scientists and politicians responsible for ensuring the environment around the world.



During these expeditions we started four BioBlitz projects in ecosystems where water availability and characteristics are different.

Agua Caliente canyon freshwater pools:

<https://www.inaturalist.org/projects/pozas-canon-de-aguas-calientes-santiago-bcs-mexico>

Santiago oasis:

<https://www.inaturalist.org/projects/laguna-de-santiago-b-c-s-mexico>

Sierra La Trinidad canyon:

<https://www.inaturalist.org/projects/canon-sierra-la-trinidad-b-c-s-mexico>

Los Frailes lagoon:

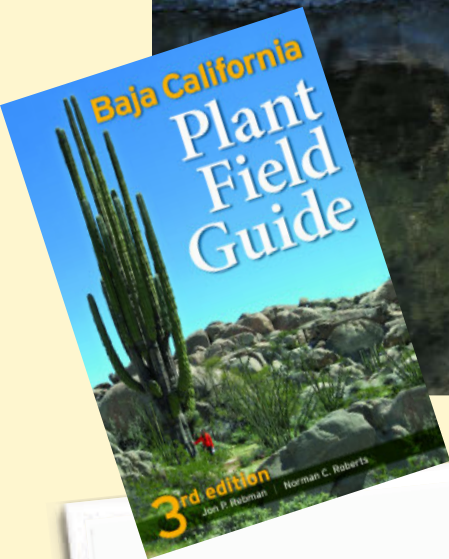
<https://www.inaturalist.org/projects/laguna-los-frailes-cabo-pulmo-b-c-s-mexico>







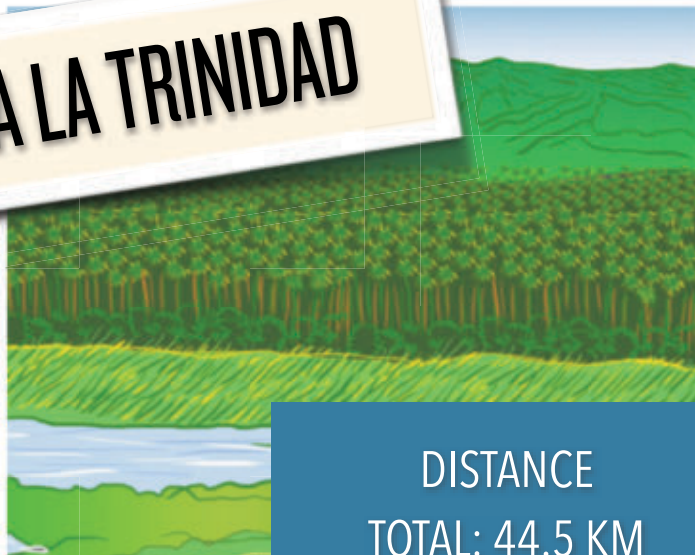
Natalia / Teacher



"Students who live in rural areas do not always recognize the value of the great variety of plants, the importance of pollinators and how to harvest their own vegetables. We are learning on the fly documenting the biodiversity of our region. This is a good life experience. "



# SIERRA LA LAGUNA - SIERRA LA TRINIDAD



DISTANCE  
TOTAL: 44.5 KM

## DAY II

Place	Activity	
Casa de Los Pájaros	Yoga / stretched. Breakfast.	<ul style="list-style-type: none"> <li>• Sunrise with the five senses.</li> <li>• Explore different styles of making a field logbook to make your own.</li> </ul>
Biosana	Introduction to the logs. "	<ul style="list-style-type: none"> <li>• To know different uses of the land to the traditional ones of a person.</li> <li>• To reflect on as part everything from a vision.</li> <li>• Know the term of Permaculture and Bioconstruction.</li> </ul>
Oasis Santiago	Visit to Biosana Project.	<ul style="list-style-type: none"> <li>• Perform sampling of physico-chemical factors to assess water quality and collect images of life associated with water, traveled in the lagoon.</li> </ul>
Santiago	Visit to Santiago oasis and tour of the palm grove by kayak.	<ul style="list-style-type: none"> <li>• Perform sampling of physico-chemical factors to assess water quality and collect images of life associated with water, traveled in the lagoon.</li> </ul>
Santiago	Preparation of pizzas in adobe oven (using harvested tomatoes).	<ul style="list-style-type: none"> <li>• Experience the use of an adobe oven.</li> </ul>
Sierra La Trinidad, Rancho Lengua de Buey	Rancho Lengua de Buey, adobe oven construction for the Estela and Alonso family.	<ul style="list-style-type: none"> <li>• Know how a ranch is kept in a much more arid place, without easy access to water.</li> <li>• Build something for ourselves that helps a family improve living conditions and learn an ecotechnic.</li> </ul>
Cañón Sierra La Trinidad	Dinner, Leave No Trace activities, closure reflexion.	<ul style="list-style-type: none"> <li>• Learn camping techniques with minimal impact.</li> <li>• Reflect on the lessons and feelings of the day</li> </ul>



# Permaculture

**Baja BioSana** is a Permaculture center that offers a space for education, meditation and cultural exchange.



We visited an adobe construction, with a small solar stove.



This project was born from having a clear vision and is the result of a lot of work.





# SANTIAGO'S OASIS



2012



2018

During dry weather, the oasis has been used as a grazing area for cattle. Today, after years with rains, it has water and a lot of life. There are interests in draining the lagoon to re-introduce the cattle but the Santiago highschool has begun to propose options of use, related to ecotourism.





# Monitoring fresh water quality

We enter the lagoon in kayaks and perform water quality tests of the following factors: pH, dissolved oxygen, BOD (biochemical oxygen demand), nitrates, phosphates, temperature, turbidity, salinity and coliforms.



We found that the lagoon contains very low levels of oxygen.

But it is a very beautiful place where many birds are found.

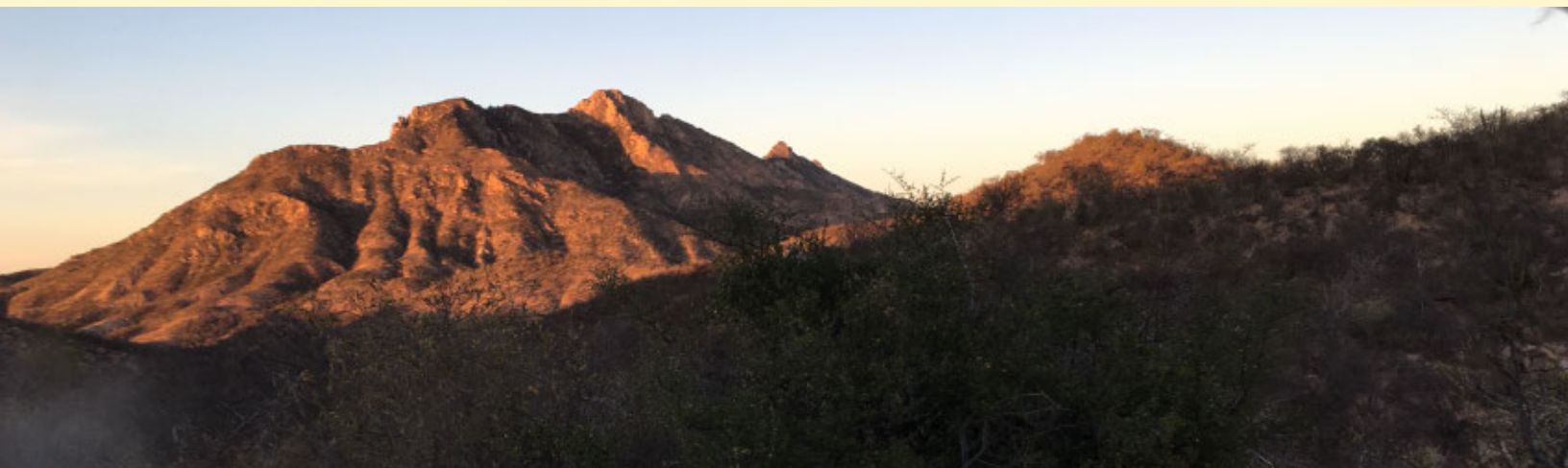


*"The methodology that is being developed for obtaining and processing information, opens a wide range of areas for citizen science projects, involving stakeholders that are affected by various social and environmental problems."*



Carlos / Teacher

*We leave to the Sierra de La Trinidad.  
This is an area that almost none of us had explored before.*







Here people have lived in ranches that have co-inhabited with the desert for hundreds of years sustaining life with very little water.





With the adobe that we harvested in the Sierra de La Laguna we built an oven for a ranch of local families.



It was easy and very fun!



# DAY III

# SIERRA LA TRINIDAD - CABO PULMO

Place	Activity	Objetivo
Cañón Sierra La Trinidad	Yoga / Stretched Raise camp. Breakfast / Activity find your point in silence.	<ul style="list-style-type: none"> <li>• Experience being alone with all our senses in nature. Observe and generate a question that will be shared during breakfast.</li> </ul>
Los Frailes	Walk to the Laguna de Los Frailes.	<ul style="list-style-type: none"> <li>• Walk to this little known and explored place.</li> <li>• Collect images of life associated with water, second Bioblitz.</li> </ul>
Snorkel en Los Frailes o El Arbolito	Talk about the Natural Area of Cabo Pulmo and importance of the reef. Snorkeling Observations at sea and on the beach. Choose a species to observe it closely in its details, draw it and then present it. Food.	<ul style="list-style-type: none"> <li>• Learn about the importance of the Protected Natural Area.</li> <li>• Experience staying still for a moment to observe the different life forms. We will notice that they approach us.</li> <li>• Observe a species in detail, investigate and present about it.</li> </ul>
Cabo Pulmo y Centro de visitantes	Visit to the community of Cabo Pulmo and the Visitor Center. Talk with Deb Zeyen, Director of BCI.	<ul style="list-style-type: none"> <li>• Visualize how the community of Cabo Pulmo is supported by low impact tourism,</li> <li>• Learn about the motivations of the program.</li> </ul>
Cabo Pulmo	Camp in the stream, dinner, talk with Judith and Juan Castro. Reflection.	<ul style="list-style-type: none"> <li>• Learn about the conservation history of Cabo Pulmo and its current challenges.</li> <li>• Reflect on the lessons and feelings of the day.</li> </ul>



DISTANCE  
TOTAL: 45 KM



We woke up in a remote place and at first sight uninhabited.



But after being alone for a moment and in silence, we observe with curiosity the life around us.



We found plants and animals different from those of the Sierra de La Laguna and we knew some of their strategies to survive.







In the middle of this stream,  
far from the pools, we found  
this small water retention work.  
It is a bottomless bucket buried  
in the sand, with a protection  
and an aluminum boat that can  
be taken.

Laguna de Los Frailes is an ecosystem that is changing all the time.  
Sometimes it can be completely dry.  
It is separated from the sea by huge dunes.



In addition to protecting us from storms and hurricanes, the dunes help us retain fresh water so that it does not mix with the sea.



It is a very little explored and studied place.





In Cabo Pulmo is the only coral reef and the area with the largest amount of fish in the Gulf of California.







For most of the students who participated in this expedition, this was the first time they experienced being in a kayak, snorkeling, camping, walking and exploring the trails around the **Sierras y Cabo Pulmo**.





# CABO PULMO - LA RIBERA



## DAY IV

Place	Activity	Objetivo
Cabo Pulmo	Yoga. Raise camp. Breakfast. Talk with Reina (from Amigos para la Conservación de Cabo Pulmo ) and member of the community of La Ribera.	<ul style="list-style-type: none"><li>• Sunrise with the five senses.</li><li>• Learn more about Friends for the Conservation of Cabo Pulmo and the current coastal growth in the region.</li></ul>
La Ribera, Rancho Buena Fortuna	Transfer to La Ribera, visit Rancho Buena Fortuna (as an example of modern permaculture) interview Kitzia, bioconstruction and food workshop. Final thoughts.	<ul style="list-style-type: none"><li>• Get to know a local ranch (run by a Mexican couple) to identify other ways to use the resources of the region.</li><li>• POST diagnosis to evaluate the experience.</li></ul>



DISTANCE  
TOTAL: 45 KM



**Buena Fortuna Ranch** is a private reserve with more than 3,000 species of tropical plants. Its purpose is to conserve plant diversity through planting and teaching.







We harvested reed and bamboo that is also used in bio-construction.

**Bioconstruction** is a building system made with low environmental impact materials extracted through simple and low cost processes such as, for example, materials of mineral or vegetable origin and that do not involve any toxicity for people and the environment.







... and among this great diversity of plants, we find animals that we had not seen before and that play an important role in nature.



We shared our reflections on what makes this region unique, what we like, what can be improved and what we can do to preserve it.



Some of us are already launching our ideas through projects that we shared with our partners.



*"So that the proposals do not remain only in ideas, I began to work in my house and my school. Soon I will work in my community. Even if it's little by little, I think, we can all do something."*

Silvana / Student

# DURING THIS EXPERIENCE

- ☑ We recognized the watershed in which we live and how our communities are connected and defined by water:
- ☑ We learned about the importance of the environmental services provided by the ecosystems that make up the basin, especially those of protected natural areas:
- ☑ We reflected on the challenges facing our region regarding tourism, real estate and mining growth,
- ☑ We experienced scientific research applied to water quality and biodiversity:
- ☑ We used different technological tools for data management and to communicate information:
- ☑ We built an adobe oven as an example of the alternatives offered by the region's materials:
- ☑ We promoted cultural exchange, communication, teamwork and respect for life in all its forms:

Now, we are inspired to take actions for the conservation of our natural space.





**Baja Coastal Institute** is a grass-root organization made up of residents of Cabo Pulmo who contribute volunteer time and resources in various programs. Our goal is to bring information and science to the communities of the East Cape, as tool for making conscious decisions regarding the future of this beautiful region.



"We can only  
love what we know  
and we can only protect  
what we love. "

Tobias Lasser