

IMPRESSIVE GEOLOGICAL FAULT

FRACTURED LIMESTONE HILL OVERLOOKING
SAVANNA EAST OF NAKUM

DR. NICHOLAS **HELLMUTH**

APRIL 2019



CREDITS

The helpful individuals listed below are all part of the FLAAR Mesoamerica research and field work team. The office research team, webmaster, and web designers are additional individuals in the main office in Guatemala City.

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Photo by: Nicholas Hellmuth. FLAAR,
December 22, 2018, 1:32 p.m

Camera: Nikon D5. Settings: f/14; 1/320th
sec; ISO 1,250





APPRECIATION

For Cooperation, Hospitality, and Assistance at Parque Nacional Yaxha, Nakum and Naranjo Project (August 2018 through July 2019)

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For cooperation, hospitality, and assistance at Parque Nacional Yaxha, we thank

All the helpful and knowledgeable guides of IDAEH CONAP at PNYNN who accompanied us each day. It is essential to have either an IDAEH and/or CONAP guardabosque or comparable when doing flora and fauna research in a national park.

Assistance for Knowledge of Plants and Animals of PNYNN

Teco, Moisés Daniel Pérez Díaz, park ranger, PNYNN

We appreciate the donation of Dr John D. Dwyer's family (Chicago) in his honor and memory.

Dr Dwyer was a botanist who worked in many areas of Mesoamerica, including the Yaxha area while the site was being mapped by FLAAR in the 1970's. The donation, provided in November 2021, has supported FLAAR research projects: the current FLAAR project of flora and fauna in Reserva de la Biosfera Maya (RBM) and the research in Municipio de Livingston, departamento de Izabal, carried out by FLAAR (USA) and FLAAR Mesoamerica (Guatemala).

This donation is also in recognition of the urgency and need for the conservation of both wildlife and rare plants within the biodiverse ecosystems of RBM in Guatemala, which includes Parque Nacional Yaxha, Nakum and Naranjo (PNYNN).

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Photo by: Nicholas Hellmuth. FLAAR, November 16, 2021, 10:03 a.m.
Camera: Google Pixel 3

What are the Geological Fault Lines?

While hiking the roughly 6 kilometers from Nakum to the savanna to the east, once you get near the savanna you begin to notice entire areas of the limestone hill that are split and fractured.

Most people in the group suggested these were where the ancient Maya had been quarrying rock. But as I continued to hike further, I noticed that fissures went deep underground. Plus the split was “natural” it did not appear to be man-made in any aspect. Every dozen meters the fractured limestone looked like a geological fault line (where one side of the hill was falling or pushed down as a deep crack opened up).

Where to find the Geological Fault Lines?

Geological fault lines are common in karst areas of Peten but I am not a geologist. So it is best if a geologist comes here or a student selects this area for a MS thesis or PhD dissertation. There is also a geological fault line that crosses the plaza of Yaxha ruins where Stela 11 is located.

Photo by: Nicholas Hellmuth. FLAAR, December 22, 2018, 1:32 p.m Camera: Nikon D5. Settings: f/14; 1/320th sec; ISO 1,25





Photo by: Nicholas Hellmuth. FLAAR, December 22, 2018, 1:32 p.m
Camera: Nikon D5. Settings: f/14; 1/320th sec; ISO 1,250

How long are the Geological Fault Lines?

I believe the fault opens up even more at the bottom of the hill, but every time we climb down the hill we are so excited to see the “kilometer wide, kilometers long” grassland savanna, that we rush out to explore the savanna vegetation and totally forget to turn 120 degrees and find where the fault line enters the savanna. In other words, will we be able to “walk into” the fissure at the level of the savanna (since I definitely do not want to explore the top of the fissure, as I do not want to fall down into the cracks).

But we hope the snapshots here will encourage geologists to visit this area. Surely there are other geological points of interest in the Parque Nacional Yaxha, Nakum y Naranjo.

The aerial photographs of Instituto Geografico Nacional, Guatemala, do not show this fault (since the fissure at the top is so narrow and the opening at the base level (of the savanna) is covered by a thick forest of tall trees. Perhaps LiDAR or satellite photography would reveal this part of the geological fault.



Photo by: Nicholas Hellmuth. FLAAR, December 22, 2018, 1:41 p.m
Camera: Nikon D5. Settings: f/11; 1/110 sec; ISO 1,200



Photo by: Nicholas Hellmuth. FLAAR, December 22, 2018, 1:32 p.m
Camera: Nikon D5. Settings: f/14; 1/320th sec; ISO 1,250



Photo by: Norma Chu. FLAAR, November 16, 2021, 12:03 p.m
Camera: iPhone 13 Pro Max.



Photo by: Nicholas Hellmuth. FLAAR, November 16, 2021, 10:03 a.m
Camera: Google Pixel 3



Photo by: Nicholas Hellmuth. FLAAR, November 16, 2021, 10:03 a.m, Camera: Google Pixel 3



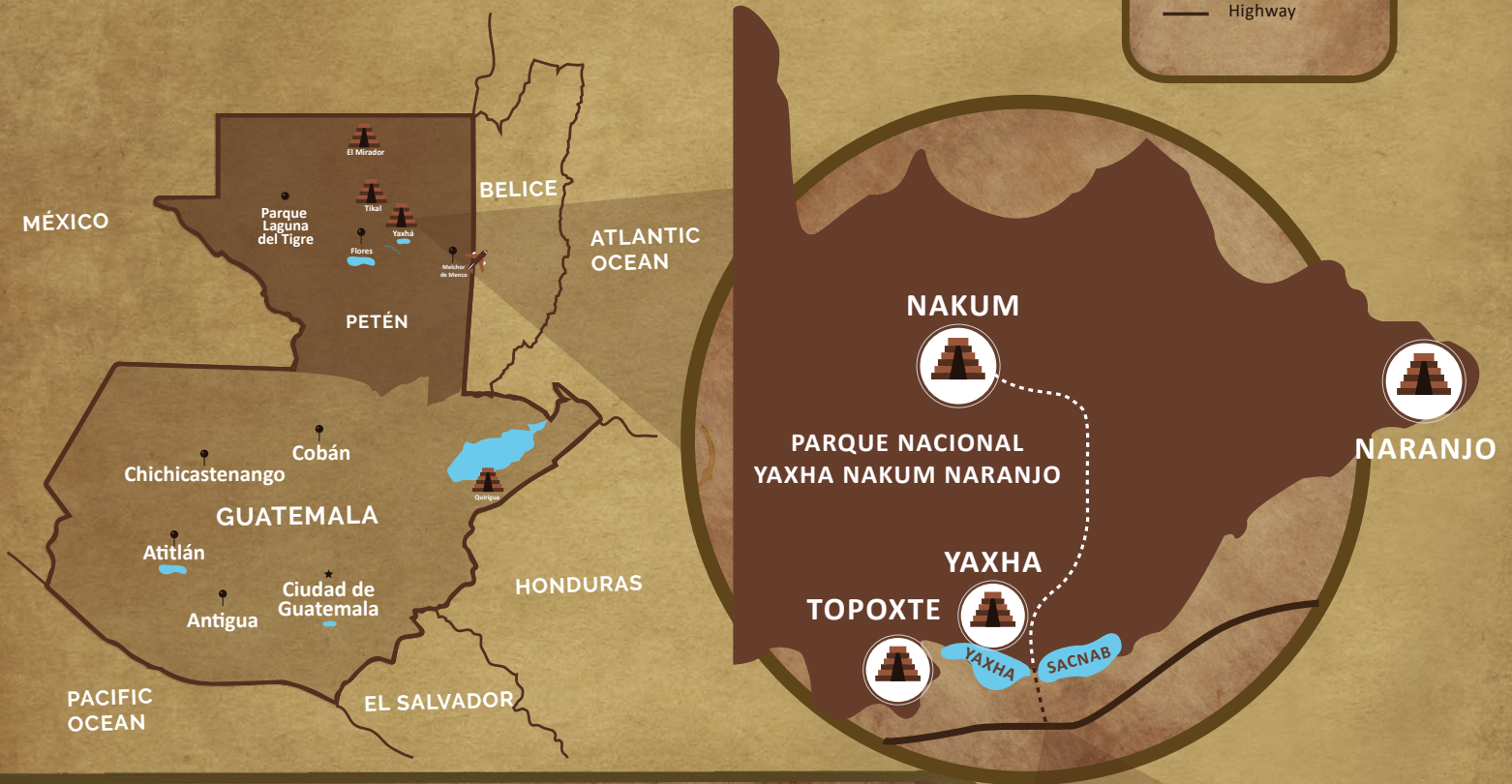
Photo by: Nicholas Hellmuth. FLAAR, November 16, 2021, 10:03 a.m, Camera: Google Pixel 3



HOW TO GET TO YAXHA?

MAP LEGEND

- Archaeological sites
- Airports
- Earthworks
- Highway



PROTECTED AREA



 **FLAAR**
MESOAMÉRICA

Go to the Mundo Maya airport in Santa Elena and then you will find a services of tourist vehicles to go to the archaeological site. If you want to go by car from Guatemala City, take the following route: Río Dulce - Poptún-Flores. At the junction further on you will find on the left the route to Tikal. Go straight on to the right towards Yaxha (towards Melchor de Mencos). In km. 521 at the village La Maquina, turn left to the site. Ecolodge El Sombrero is 50 meters before the entrance to National Park Yaxha - Nakum - Naranjo.

Base Camp Assistance in PNYNN

We thank Biologist Lorena Lobos and both co-administrators of PNYNN (Arq. José Leonel Ziesse (IDAEH) and Lic. Jorge Mario Vazquez (CONAP)) for providing a place to stay for the photographers, biologists, and assistants of the FLAAR Mesoamerica team of flora and fauna during the 1-week-a-month field trips August 2018 through July 2019.

In turn FLAAR purchased and donated a cooking stove when the original one no longer functioned, plus we have photographed and documented many tree and insect species that we found around this camp.

Ecolodge El Sombrero

I thank Gabriella Moretti, owner of Ecolodge El Sombrero, for providing hotel room and meals while we have been doing field work at Parque Nacional Yaxha Nakum Naranjo. We also appreciate the hospitality of her sons Sebastian de la Hoz and Juan Carlo de la Hoz. Every workday is exhausting because we are carrying and then using very heavy cameras, super-telephoto lenses, sturdy tripods, large gimbals or ball tripod heads. Thus it is crucial for my health to be able to rest and totally recuperate every night in order to be ready for the following day of botanical and zoological adventures in Parque Nacional Yaxha, Nakum and Naranjo.

Equally crucial is having a place to charge the batteries of the computers, or all the cameras, and of the cell phones. Solar power is great, but it lasts only an hour, or less, if you plug in multiple computers and cameras and flash batteries to charge. So a place with enough electricity to charge the entire mass of essential field work equipment is essential and thus very much appreciated.

In order to post photographs on botanical and zoological websites, you can't do this if there is either no Internet or weak Internet. Thus it is very helpful that when we are provided rooms and meals, that Internet is also provided by the Ecolodge El Sombrero.

Contact Info:

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Photo by: Nicholas Hellmuth. FLAAR, December 22, 2018, 1:32 p.m
Camera: Nikon D5. Settings: f/14; 1/320th sec; ISO 1,25

Permissions

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www.digital-photography.org or
www.FLAAR-Mesoamerica.org.

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Any web site in or related to the Municipio of Livingston, is also welcome to post this PDF on their web site (no fee). This permission includes travel agencies, hotels, guide services, etc. And you do not need to write and ask permission; but we do appreciate when you include a link back to one of our web sites.

CECON, CONAP, FUNDAECO, INGUAT, ARCAS, IDAEH, Municipio de Livingston, etc. are welcome to publish our reports, at no cost.

All national parks, nature reserves, and comparable are welcome to have and use our reports at no cost.

To publish photographs

Hellmuth's photographs have been published by National Geographic, by Hasselblad Magazine, and used as front covers on books on Mayan topics around the world. His photos of cacao (cocoa) are in books on chocolate of the Maya and Aztec both by Dr Michael Coe (all three of editions) and another book on chocolate by Japanese specialist in Mayan languages and culture, Dr Yasugi. We naturally appreciate a contribution to help cover the costs our office expenses for all the cataloging, processing, and organization of the photos and the field trip data.

For your social media

You can post any of the FLAAR Mesoamerica PDFs about the Municipio of Livingston on your Social Media sites; you can send any of these PDFs to your friends and colleagues and family: no cost, no permission needed.

We hope to attract the attention of professors, botanical garden clubs, orchid and bromeliad societies, students, tourists, experts, explorers, photographers and nature lovers who want to get closer, to marvel at the species of flowering plants, mushrooms and lichen that FLAAR Mesoamerica finds during each field trip each month.

Back Photo Credit:

Photo by: Nicholas Hellmuth. FLAAR, December 22, 2018, 1:32 p.m Camera: Nikon D5. Settings: f/14; 1/320th sec; ISO 1,250

ACKNOWLEDGEMENTS TO FLAAR MESOAMÉRICA

The reports are a joint production between the field trip team and the in-house office team. So here we wish to cite the full team:

Flor de María Setina is the office manager, overseeing all the diverse projects around the world (including FLAAR-REPORTS research on advanced wide-format digital inkjet printers, a worldwide project for over 20 years). We also utilize the inkjet prints to produce educational banners to donate to schools.

Vivian Díaz environmental engineer, is project manager for flora, fauna projects (field work and resulting reports at a level helpful for botanists, zoologists and ecologists, and for university students). Also coordinates activities at MayanToons, division where educational material for kids is prepared.

Victor Mendoza identifies plants, mushrooms, lichen, insects, and arachnids. When his university schedule allows, he also likes to participate in field trips on flora and fauna research.

Vivian Hurtado prepares the bibliography for each subject and downloads pertinent research material for our e-library on flora and fauna. All of us use both these downloads plus our in-house library on flora and fauna of Mesoamerica (Mexico through Guatemala into Costa Rica).

Sergio Jeréz prepares the bibliography of each topic and download the pertinent research material for our electronic library on flora and fauna. We all use these two downloads plus our internal library on Mesoamerican flora and fauna (México through Guatemala to Costa Rica).

Andrea de la Paz is a designer who helps prepare the masterplan for aspects of our publications. She is our editorial art director

Norma Estefany Cho Cu helps with preparing the camera equipment for each field trip and helps in the office (and on field trips) as cook.

Jaqueline González is a designer who puts together the text and photographs to create the actual report (we have several designers at work since we have multiple reports to produce).

Roxana Leal is Social Media Manager for flora and fauna research and publications, and MayanToons educational book projects. María Alejandra Gutiérrez is an experienced photographer, especially with the Canon EOS 1D X Mark II camera and 5x macro lens for photographing tiny insects, tiny flowers, and tiny mushrooms. Work during and after a field trip also includes sorting, naming, and processing. And then preparing reports in PDF format.

David Arrivillaga is an experienced photographer and is able to handle both Nikon and the newest Sony digital cameras. Work during and after.

Juan Carlos Hernández takes the material that we write and places it into the pertinent modern Internet software to produce our web pages (total network is read by over half a million people around the world).

Paulo Núñez is a webmaster, overlooking the multitude of web sites. Internet SEO changes every year, so we work together to evolve the format of our web sites.

Valeria Áviles is an illustrator for MayanToons, the division in charge of educational materials for schools, especially the Q'eqchi' Mayan schools in Alta Verapaz, Q'eqchi' and Petén Itzá Maya in Petén, and the Q'eqchi' Mayan and Garifuna schools in the municipality of Livingston, Izabal.

Josefina Sequén is illustrator for MayanToons and also helps prepare illustrations for Social Media posts and for animated videos.

Rosa Sequén is also an illustrator for MayanToons and also helps prepare illustrations for Social Media posts and for animated videos.

Laura Morales is preparing animated videos in MayanToons style since animated videos are the best way to help school children how to protect the fragile ecosystems and endangered species

Maria José Rabanales she is part of the team for editing photographic reports and educational material of Flora and Fauna since September 2020. She works together with others of the team to prepare the finished pdf editions of the material of the Yaxha, Nakum and Naranjo Project.

Alejandra Valenzuela biology student is now part of Flora y Fauna's photographic report and educational material editing team since September 2020.

Alexander Gudiel designer who join the editorial design team on December 2020. He will combine the text, pictures and maps into the FLAAR Mesoamerica editorial criteria.

Cristina Ríos designer student who join the editorial design team on December 2020. He will combine the text, pictures and maps into the FLAAR Mesoamerica editorial criteria.

Byron Pacay handles GPS mapping of where we hike or go in the lancha (boat) each field trip day. He also lists where we stop to take photos and what each one of us is photographing and then has that tabulation ready each night.

OTHER PUBLICATIONS FROM NATIONAL PARK **YAXHA, NAKUM AND NARANJO, GUATEMALA**

If you wish more FLAAR reports on flora of Guatemala, visit our website:
<https://flaar-mesoamerica.org/projects-national-park-yaxha-nakum-naranjo/>

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