2016

Zavora Marine Lab
Mozdivers

Research & Conservation in Mozambique

[INTERNERSHIP PROGRAM]
MOZDIVERS INTERNSHIP PROGRAM

ZAVORA MARINE LAB.

www.zavoralab.com
www.mozdivers.com

MOZAMBIQUE
2015

ZAVORA MARINE LAB.

The Zavora Marine Lab. was established in 2009 to promote and facilitate research and conservation in southern Mozambique. Since its inception our lab has developed vital research for the region and raised environmental awareness through educational programs with local communities and visitors to the area. In 2013 the Lab. joined Mozdivers to provide outstanding training in both diving and marine biology.

Traveling to Zavora was one of the best choices of my life. I just learned so much in such a short time from so many people. The work is interesting and absolutely necessary for this area. A journey to Zavora will yield great friendships, experience, eternal knowledge, and a load of good times.

Jesse

The sub-tropical reefs of Zavora are stunning and the diversity of life is impressive. In Zavora, diving tourism is still in its infancy and very little is known about the marine life. Therefore, Zavora offers the unique opportunity to study a marine environment that has had little to no impact from recreational diving activities and where there yet remains a lot of reef to be explored. We are currently working on projects involving Manta Ray populations, ecology and taxonomy of nudibranchs (sea slugs), sea horse global monitoring program, artificial reef colonization and the relative population of humpback whales, as well as collaborating with other research projects including sea turtle monitoring and photo ID, manta ray distribution using acoustic tags and whale shark photo identification.
Zavora Marine Lab. is the research department of the Association of Coastal Conservation of Mozambique (ACCM) and together with Mozdivers works in partnership with dive centers and local schools to ensure knowledge is not only created but shared. Because the ACCM has an excellent relationship with the private sector, and Zavora is still quite wild and remote, our research can effectively be applied to avoid destructive development.

**INTERNSHIP**

The internship program was developed to provide a world-class opportunity for science students and environmentalist to assist with marine research and conservation. The internship offers a great chance for dedicated students and conservationists to engage in real world research and meaningfully contribute to our projects. Interns will get experience in all of our projects and experience both the challenges and the pleasures of working in the most beautiful, wild and remote coastal environment of southern Mozambique.

Interns have the option to take the following programs:

1) **“Marine biology internship”** – interns will participate and get trained in all our research and conservation projects. This program is ideal for marine science students and dedicated conservationists with minimum of an advanced open water diver qualification, interested in gaining exceptional knowledge in marine biology and field research techniques.

   *Investment: 2,600USD per month or 1,850USD for 2 weeks*

2) **“Recreational Diving and Marine biology”** – this internship combines the first steps of diving education associated with the marine biology internship. This is ideal for people with not enough diving experience interested in learning more about marine life and improving their dive qualifications. Options vary from open water diver to rescue diver, the course structure will depend upon the qualification and experience of each intern. However most of the interns will spend about 10 days improving their diving skills and the rest assisting on surveys. This internship include all marine biology training and one recreational course.

   *Investment: 2,900 USD per month*
3) “Tech/Rebreather Diving and Marine biology” – This is the ultimate internship for experienced divers who are interested in moving forward into the world of technical/rebreather diving. By combining technical diving methods and equipment with marine science, interns will become more able to conduct research diving outside of traditional recreational limits while improving their overall dive safety and knowledge. Interns can choose between rebreather or technical decompression courses. About 10-15 days will be dedicated on their technical or rebreather course and the remaining time to our research projects.

Investment: 3,100USD per month*

*Not including gases or rebreather rental

4) “University projects” – interns are also welcome to develop their own university project, it may or may not be related to one of the on-going projects. We will provide all field assistance necessary to the achievement of your goals and interns will be welcome to take part of our marine biology internship to gain a wide broad experience.

Please consult us for quote as the cost depends on material and number of dives required.

"Interning for Závora Marine Lab was an amazing experience. It is in a truly beautiful environment with an extraordinary diversity of marine life. I was able to learn so much through the field work and data collection which were both demanding and a lot of fun, even at times tedious, but always rewarding. Working so close to the local community gave me an opportunity to observe their day to day life and the ways in which they contribute to the ecosystem. The experience was made even richer because I was working with such a wonderful group of people while also contributing to the understanding and conservation of such an important resource. Hearing the Humpbacks singing as we were diving is an experience I will never forget."

Catriona
**Intern roles** include (but are not restricted to) collecting underwater and land based data, transferring data to the database, assisting with the education projects, giving talks, fundraising, organizing and participating in events for environmental protection. Please note that due the nature of the work, not all applications will be accepted. You will need to 1) be serious about data collection and marine conservation; 2) have 1 year or more of a science degree or equivalent level of experience and dedication to conservation; 3) have a minimum of an advanced open water diver/2 star diver certification (any recognized agency). **If you do not meet the diving criteria** you must join the dive and marine biology internship to get additional training and qualification to improve your dive skills before you start collecting data.

*My internship at Zavora was an incredible experience and I will never forget how it felt to be surrounded by curious Manta rays or how a whale song can make your body shiver. Living at such a remote place and working on diverse research projects is a strange combination, but at Zavora it works! I recommend this internship to everyone who wants to gain experience in a marine conservation project, to everyone who loves to dive and to everyone who simply likes having a good time.*

Robert

**FOR ALL PROSPECTIVE INTERNS**

It is important to recognize that the internship program we offer is not a holiday. Interns will be joining dedicated scientists who are conducting accredited research projects important not only for Mozambique but for science in general. The projects demand a significant level of dedication to the scientific and practical responsibilities from the participants. However, the demands are well within the capabilities of most students, and while being challenging, are both enjoyable and exciting. Zavora has a stunning beach, is far from town and running on its own time. Sometimes the remoteness can be difficult, but there is not a better way to experience the “real Africa”.

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Interns taking part of our marine biology internship can expect to get practical and theoretical training during the first/second weeks. After learning each sampling technique interns will then start to collect data. For the entire duration of your stay, we will give you research assistance and some supervision, but you are expected to work hard and independently in order to achieve outstanding goals. This is an opportunity to contribute meaningfully to exciting marine research and conservation projects, as well as experience the frustrations, the highs and the lows, and the achievements associated with ambitious and challenging marine research in Africa.

The dives will be done from one of the local dive centers; however all the interns dives will be conducted separately from tourists and guided by one of our staff, giving us freedom to concentrate on our work.

Interns will stay at our research center, which was built using sustainable techniques as an example of conservation practices. The non-structural walls are made with glass bottles, the roofs are natural thatch and the structural walls are made out of compressed (no fire involved) low cement bricks. The position of the center was carefully chosen to make best use of natural light and wind resulting in a thermally stable building needing very little power input. The research station is located a 5 minute walk from the beach and close to the community who we involve in educational projects, as well as the marine research.

As part of this program, interns can expect to be important members of a focused and dedicated research station and partake in ground-breaking research. Our laboratory will receive a maximum of six (usually 2-4) interns per month. The fee charged is used to cover your expenses while in Zavora and help towards the running costs of the centre and projects.
Our internship fee includes:

- Up to 25 dives per month including equipment rental
  *(12 dives for the 2 week program)*
- Use of the laboratory facilities and research equipment
- Return transfer between Inhambane-Zavora on the 1st of each month
- Accommodation at our research station
- Transport to Inharrime every two weeks to buy food supplies
- Monthly field trip to Inhambane Estuary to collect sea horse data
- A 5,000Met food allowance per month (or 2,500met for 2 weeks)
- Research training and assistance
- Diving training, materials and certification on combined dive course + internship programs

Our internship does not include:

- Flight and transport from country of origin to Mozambique.
- Visa expenses
- Transfers that are not on the 1st of each month
- Internet (Wi-Fi available by request. Price: 1000met/month)
- Drinks and meals apart from the food allowance.

Interns will participate in all research projects including data collection, data entry and, in some cases, data analysis. The normal ‘routine’ of the internship is to collect data during the morning and enter data during the afternoon, but changes can occur depending on weather conditions, research tasks and special events. Once per week we do environmental education activities with the local kids and we arrange a monthly beach cleanup and underwater cleanup.

Partnership might be accepted with Universities and organization interested in developing other projects in the area or conduct marine biology field courses.

Some of our past interns have received credits from their university after completing an internship here. Please contact us and your school to investigate this possibility.
Tasks and duties including:

- Underwater photo identification of manta rays using underwater parallel lasers for measurements
- Nudibranch (sea slugs) search per time
- Nudibranch quadrate
- Nudibranch collection and preservation
- Nudibranch dissection (when appropriate)
- Flatworm collection and preservation
- Maintenance of the nudibranch tank
- Camera maintenance
- Field research organization
- Video transect at Rio Saiñás Wreck
- Photo quadrat at Rio Saiñás Wreck
- Daily physical condition data collection
- Sea Horse Monitoring Program (data collection and entry monthly)
- Sea Horse Habitat Monitoring (data collection and entry monthly)
- Humpback whale land based survey and photo ID (during season – June-October)
- Conducting user group surveys on marine eco-tourism
- Turtle patrolling and monitoring (during season – Nov-March)
- Data entry – using Excel, NudilID and MID – (software especially designed for Manta Ray identification)
- Educational activities including:
- Regular activities with kids from the local community
- Public talks
- Underwater clean up of left over fishing nets
- Workshops (e.g. recycling)

How do you apply?

To apply please submit your CV with picture in reduced format along with the Application Form to yara@zavoralab.com or contact your agent.
OUR RESEARCH PROJECTS

Research Projects

1. Manta Ray Population using photo ID

Manta Rays are the largest rays in the world. Recently the genus *Manta*, that was historically considered monotypic, was re-described into two different species, *Manta birostris* and *Manta alfredi*. In Zavora *M. alfredi* is the most abundant, however both species can be seen all year round with the peak between June and September. Despite the abundance, little is yet known about our manta population. Manta rays have a unique spot pattern on their belly and between their gills, which make it possible to identify individuals. Photo identification uses the same principles as mark and recapture studies but because of the distinctive pattern we are able to use photos instead of tags. The advantage is that photo-identification is a non-invasive technique and you are still able to gain valuable information about these fabulous animals. The software, Manta ID (MID), was especially designed for the Lab. to easily identify individuals.

Our research aims to raise knowledge about Zavora’s manta population and assist with the conservation of these massive rays. Some of our research questions are:

- What is the structure of the manta ray population?
- To what extent do manta rays in Zavora belong to the same population of manta rays in other southern Mozambique areas (e.g. Tofo and Guinjata)?
- What is the abundance of manta rays over the years and what variables might affect such abundance?
- How do the manta rays use our cleaning stations?
2. Nudibranch diversity and distribution

Sea slugs are one of the most diverse marine invertebrates in the world with more than 5000 species described and many that are yet to be described. The biggest group of sea slugs is the nudibranchs, well known by experienced divers due to their vibrant colors and amazing camouflage.

In the Western Indian Ocean studies on nudibranchs have been very limited, giving us a unique opportunity to discover and explore new ground!

We are conducting the first study on nudibranchs in Mozambique, looking at diversity, taxonomy and distribution. This project is part of Yara’s PhD on marine science by the University of Cádiz. Several techniques are used to collect our data including searching per time, quadrat, analysis of substrate and small artificial reef (SAR).

So far, more than 210 species have been found in Zavora alone, 90% are new records to the country and around 30 are undescribed to science.

Specimens are described externally and when necessary the internal morphology is investigated through dissection conducted in our lab. For some particular groups molecular analysis is done at The University of Cádiz.

3. Humpback Whales

Humpback whales are one of the most fascinating animals on Earth. Every year they come to Zavora to reproduce and give birth to their calves. Small and large groups of these mammals can be easily observed from shore and often
heard, even occasionally seen underwater.

During the whale season we conduct land based whale assessment to estimate the relative population of humpback whales using Zavora Bay, observations are conducted three times per week from 6am till dark, during which time we collect various data such as the estimated number, behavior, direction of movement and position of whales. A good day of surveying can generate over 100 humpback whale sightings, the data revealing preferential areas for humpbacks in the bay according to behavior. In 2014 we photographed the first record of a newborn whale in the region, which still had its umbilical cord.

Every Humpback whale has distinct markings on their tail fluke making it possible to identify individuals. Humpback whale photo ID is a challenge, but it is an important tool for migration studies, as it allows us to compare our data with other similar projects, and also try and recognize returning individuals. We have created the first national online humpback whale database, www.mozwhales.org allowing our research to reach even further.

4. Artificial Reef Colonization

On the 11th of March 2013, the Rio Saiñas sank in Závora Bay. The wreck is of a 250 ton fishing vessel, which drifted to shore after losing power. After evaluation the insurance company declared it a write off, so the plan was to clean the vessel and sink in international waters. After all the fuel and oils were pumped off, she was towed off the beach but due bad weather sank just 3 km from the shore. It was an excellent opportunity to start a monitoring program to evaluate colonization from zero in a wreck in the Indian Ocean.
A complete survey has been done including benthonic and fish communities. The growth of marine life has been extremely rapid. Today the wreck is home of few red listed animals such as the brindle bass (Epinephelus lanceolatus) and the catface grouper (Epinephelus andersoni).

Monitoring is done through photo quadrat of the substrate, video transect and stationary fish census.

5. Sea Horse Monitoring Program

In January 2015, Zavora Marine Lab. has combined it’s efforts with the iSeaHorse Program to monitor and protect the sea horses of Barra Lagoon. Barra Lagoon is an Estuary located 100km from Zavora, in Inhambane. The sea grass bank is a habitat for a great abundance of sea horses. However there is no current information on the status of the sea horse population in the area. The iSeaHorse Monitoring Program is a standardized international program aiming to assess the sea horse population, trends and treats.

Trend data helps to identify seahorse populations that are in need of further research and conservation management, and allows policy-makers and managers to set priorities based on scientific information rather than anecdotal observations. By sharing results, as well as collaborating with and supporting local groups, we can all work to improve the fate of seahorses while engaging more people in ocean conservation.

All participants will take formal training that can be used in Mozambique or any other place around the world and receive a participation certificate from iSeaHorse.
Sea Turtle Photo ID

Sea turtles, as mantas and whale sharks, have individual patterns on the face that helps to reorganize individuals. Such patterns allow research to understand population status and movements. This information is essential to robust management plans and conservation. Additionally, our sea turtle data is being currently used by a PhD candidate to better understand treats and population status of sea turtles in Mozambique. Interns will assist on data collect and learn how to use the ID software TORSOOI.
F.A.Q. (Frequently Asked Questions)

Eligibility?

The internship program is designed for science students or exceptional naturalists aiming to get experience in marine conservation. You must submit your CV with all information required. Note that due the nature of the research, not all application will be eligible. You don’t necessarily need to be a science student, but dedication, interest in marine research and responsibility are essential.

Do I need any specific qualifications?

Interns must be competent SCUBA divers to take part on the marine biology internship. If you don’t have enough underwater experience you can join the diving and marine biology program. If you are an experienced diver, you can also join this program to gain knowledge in technical and/or rebreather diving, as these techniques can be very beneficial for underwater surveys. Please contact us to discuss pre requisite diving qualifications for the technical and rebreather courses.

For how long?

Interns will be asked to stay for a minimum of 15 days for the marine biology internship and one month for any other package. However, we highly recommend a minimum of a month to get stuck in to our projects. If you wish to develop your own project, depending on your topic a minimum of 3 months is recommended.

Where?

The Lab. is located in Zavora Beach in southern Mozambique, approximately 1.5 hours south of Inhambane town and 9 hours north of the South Africa-Mozambique border. We are a remote destination with the closest town (Inharrime) around 30km away. With the exception of mid-December to mid-January, which is the busiest tourist season, Zavora is very quiet and peaceful. It is an excellent place for people who enjoy being close to nature, and who enjoy the thrill of exploring untouched reefs.
**How to get there?**

The best way to get to Zavora is undoubtedly by plane. You should easily be able to find a flight from your home country to Johannesburg and then from Johannesburg to Inhambane Airport. A few airlines also fly directly in to Maputo, but this is usually a more costly option. At the moment LAM is the only company that flies to Inhambane. You can buy your ticket on-line at www.lam.co.mz. Always consider a few extra hours in Maputo or Johannesburg for your returning flight as LAM rarely runs on schedule.

A cheaper, but a far more tiring and uncomfortable alternative is to get a ‘chapa’ (local, over-crowded bus) from Maputo to Inharrime. Alternatively, from Maputo you can get a bus (Intercape) to Maxixe and cross to Inhambane by the ferry boat, where we can pick you up.

**Arrival dates and arrangements:**

Pick-ups and drop offs on the 1st are included in the cost. We pick up interns in Inhambane, Inhambane airport and Inharrime town. Interns arriving or leaving outside this time will be required to arrange transport from the airport to the research station (about 100km- 1.5hours) at their own cost. We offer this service for U$70 (one way).

**How much money should I bring?**

There is not much to spend money on in Zavora apart from a small souvenir shop and a couple of bars and restaurants. However, interns often like to spend 2 days in Tofo to do Ocean Safaris or party, so depending on the applicants habits and lifestyle, we usually suggest adding about U$300-500 to their monthly budget for their souvenirs, excursions, entertainment and other personal daily needs. Locally, the restaurants and bars accept VISA and there are ATM’s in Inharrime and Inhambane.
Can I cancel or change the dates of the internship?

Due to the number of applications received and the limited places available, we can unfortunately not accept all applying interns. Therefore, we do not welcome cancellations or date changes after the final confirmation has been sent to us. Please, make sure that the dates you indicate in your application form suit your own schedule/budget before applying.

We request that a 1 month deposit is paid on acceptance into the program as confirmation (foreign and local bank fees are at the applicant’s cost). The remaining fee must be paid in full within two weeks following arrival in Mozambique. Cancellations prior to 6 months before the internship begins are accepted without cancellation fee (deposit will be refunded in full). Cancellations between 6 and 3 months before the start of the internship will be charged a penalty of 50% (50% refund of deposit). Cancellations that are less than 3 months before the start of the internship will include a 25% refund. We would, however, appreciate it if you could let us know of any changes or cancellations as soon as you are aware of these, so that we are able to welcome another applicant.

Do I need a VISA?

Yes. The Mozambican law says that everyone who has an Embassy in their own country should apply for a visa prior to arrival. However in practice you can get your visa at the border, particularly if you are flying in. However to avoid potential surprises we highly recommended to check at the Mozambican Embassy in advance. The border visa is a 30 day single entry visa (around US$80: it can vary), which is extendable for another 30 days. If you wish to stay longer you will need to extend it in Maxixe (100km North of Zavora) or make a trip to the border at your own cost.

If you plan to stay longer than 2 months we recommend applying to the Mozambiquan Embassy in your home country and request a 3 months visa with single entry, as a multiple entry (30 days max. stay) means that you will have to renew your visa at the border every 30 days. When you apply please highlight in
the application form that you will be far from the border and therefore you would prefer a single entry rather than a multiple entry. A single entry can sometimes be difficult to get, as multiple entry is the norm, it just depends on your persuasion skills and your luck! Please contact us for a letter of invitation, which will help in the application in these cases.

For interns who buy a one way flight we recommend to consult your airline and the Mozambican Embassy in your home country to ensure that you can get your visa at the border.

**Do I need insurance?**

Yes. When you are accepted in this program, you will have to sign liability and copyright documents, as well as an agreement that you are knowingly partaking in potentially dangerous activities. You will not be covered for accidents or illnesses through the Lab., so please do organize your own medical and health insurance.

You may apply for a normal travel insurance policy. Chances that you will be injured are very small if you follow the safety guidelines and do not try anything foolish. However, you will be working on a boat in conditions which can, at times, be less than comfortable. Accidents on a boat may occur, so it is important to be covered in case of an emergency or accident. Please make sure you have insurance for your entire stay in Mozambique, and also make certain that your insurance also covers diving accidents, as many normal travel insurance policies will not cover this. There is no recompression chamber in Mozambique and in case of a diving accident you will need to be transported to South Africa. We highly recommend Divers Alert Network (DAN) membership. DAN is a non-profit organization focused on diving accidents, and they also offer plans that cover travelling accidents. To apply or to find more information please visit [www.diversalertnetwork.org](http://www.diversalertnetwork.org)

**Do I need any specific vaccination or medication before coming to Mozambique**
Zavora is located in a malaria zone, some interns prefer to use prophylactic medication, while others prefer to protect themselves using repellents and a mosquito net. It is up to you. Recommended medicines are: Malarone (side effects: damages liver so it is advisable to drink alcohol in small quantities or, even better, avoid it), or Doxycycline (side effects: short periods of increased photosensitivity, thus recommended to be taken around dinner with food). Malaria tests and treatment are also available on site. Bear in mind that SCUBA diving while using some prophylactic medications (such as Larium or Mefloquine) is not recommended – your choice of medication should be made accordingly.

In any case it is recommended to bring mosquito repellents to be used mostly during dusk and dawn periods.

Please consult your doctor for any other recommended vaccinations.

**What do I need to bring?**

A waterproof wind breaker jacket, a wide brim hat, a fleece or other warm clothes (Zavora can get surprisingly cold, especially during the winter months), insect repellent, factor 30+ sun block, towel. Bed sheets will be provided.

We also recommend polarized sunglasses (which allow you to see through the water better), and please don’t forget your diving certification card! Note that a water proof (to min. 30 meters) watch OR a dive computer is compulsory! You can use the dive centres equipment, but we recommend that you bring your own; particularly wetsuit, mask, snorkel, fins and inflatable deploy buoy (DSMB). It is advised to use wetsuits of at least 3-5mm in summer and 5-7mm in winter, some divers also like to use hoods for extra warmth during our winter months.

**Do we have days off?**

You will have a day off per week and whenever the weather and sea conditions do not allow field work and no other work on the data or maintenance is needed. If you wish, you will be allowed two to three days off per month for excursions or
activities not included in the internship. This must be requested some days ahead so we can work our schedule around it.

**USEFUL INFORMATION ABOUT ZAVORA AND YOUR STAY HERE**

**Location**

The remoteness of Zavora is what makes this place quiet, special and unexplored. Many things that you normally take for granted (e.g. cheese, ham, red meat, coffee, a washing machine), are luxuries, or even non-existent, here. We are about 30km from the closest town – Inharrime. Mozambique is classified as a least developed country (LDC), being one of the 20 poorest countries in the world. We are far from the capital, which means that products are scarce. Inharrime town, where we do much of our shopping is very small and a typical ‘African village’. Here you will find only your basic foods such as seasonal vegetables and fruits, chicken, eggs, rice, beans, pasta and (most of the time) milk. Products such as batteries (apart from very poor quality in the most common sizes), insect repellents and sunscreen are NOT available. You are therefore advised to bring anything you might need apart from basic food.

**Food**

Due to the differences in food preferences amongst interns and the limitations of products, we have decided to give each intern a 5000Met food allowance on arrival, so each intern can choose what they prefer to eat. This way, we can give you the freedom of choice and we can concentrate on what is more important: our conservation and research projects! We will provide transport to Inharrime town once every 2 weeks to buy supplies. For those who don’t like to cook, we can organize a local lady to cook traditional meals once per day, six times per week (she charges Mzn 2000/month for this service which will be deducted from your allowance). She follows a weekly routine and cooks meals like pasta, chicken, matapa (a local favorite made with cassava leaves), cassava, etc.
Accommodation

Interns will be based at our research station. The research station was built to provide facilities as a field laboratory and housing for interns. On our land you will find the main building (research center), a communal kitchen, female and male toilets/hot showers, a storeroom and the directors’ house. The center has a dry lab for the computers and books, a wet lab with 3 stereoscopes, 1 microscope, a precision scale, fish tank etc. and a conference room with a video projector. Upstairs are 3 bedrooms for interns (up to two interns per room) and a living room. The large communal kitchen has plenty of fridge/freezer space, a hob, oven, hot water and there are braai (barbeque) facilities outside. For your security and convenience, the lab directors’ house is located on site in case you need any assistance outside of working hours.

Electricity

In Zavora mains electricity arrived in December 2012 and it is limited to a few houses and enterprises. Most of the local community lives under the light of the moon. In Mozambique we occasionally experience power outages, usually for short periods of time, we have back up from a solar panel and batteries in this case. However, solar power has its limitations, be aware that the solar power system will not give you unlimited electricity. Our plugs are 220V. We have Mozambican (round two pin) and South African (round three pin) sockets, we advise that you bring an adaptor for your phone/PC chargers.

Money exchange

You are advised to change your currency to the Mozambique Meticais when arriving in Mozambique. You can also withdraw cash from the ATM in the closest town once every two weeks (VISA card normally works better than other cards). Limited places accept VISA cards and other currencies might be accepted but the exchange rates are worse than in the bank. Please take care if changing money with people on the streets or at the border crossings, preferably wait until you are collected for your transfer and our staff will help you with this.
Diving

All dives included in the internship are scientific or training dives only. You will be collecting data that will be used to manage the dive sites, check the health of the reefs and the manta ray population. Please concentrate on your task. You will enjoy your dives and see lots of marine life, but you must be aware of your role as a researcher. We will not permit ‘fun recreational diving’ at the cost of data collection during scientific dives. Remember that a doctor is responsible for the health of a patient, in the same way a marine scientist is responsible for the health of the reefs. If a doctor makes a mistake it might result in injury and death of the patient. If the scientist does not provide the right information based on serious research, the result might be wrong and its use will result in bad management and potential damage to the marine environment. Being responsible with the data is essential.

Extras available on request:

• IANTD (International Association of Nitrox and Technical Divers) Courses from Open Water to Dive Master, Nitrox, Technical, Trimix and Closed Circuit Rebreather

• PADI courses from Open water to Dive Master

• Nitrox/Trimix fills, rebreather rental and support for divers bringing their own units

• Reef Monitoring course (Reef Check) – only possible for interns staying at least 2 months

Visibility

The waters of southern Mozambique have visibility ranging from 5-30 metres, with an average of 12-15 metres. Offshore reefs usually have better visibility than inshore reefs as wave action is not such a factor. Poor visibility can be the result of bad weather and big waves stirring up the bottom or can be caused by the upwelling of cold nutrient rich water from the Mozambique Channel. This upwelling water usually causes a chain of events, starting with a bloom in Phytoplankton, tiny plants trapping the suns energy by photosynthesis. This tends
to turn the water greener. This plant life then supports a bloom in Zooplankton, small animals and jellyfish, this then turns the water a slightly milky blue colour as they grow and eat the Phytoplankton. Then the animals that divers want to see, the mantas and whale sharks, get involved to complete the cycle by eating the Zooplankton. So, without some days of poorer visibility, Mozambique would not have the charismatic mega fauna that makes it such a fantastic place to dive.

Best time of year to come.

It is difficult to recommend a ‘best time’ here in Zavora as all times of year have positive attributes.

From 15th December to the 15th January and Easter are the busiest seasons due to South African school holidays. All other months are quieter. November to March have warmer water and usually better visibility with mating manta ray events, but with December to March being cyclone season, we can miss some days diving due to storms we are unlucky, although this is seldom the case. The temperature on land can get up to 40 degrees C in January and February, whilst it can get as low as 15-20 degrees C in June-August.

June to October is colder and the visibility is lower but the mantas appear to love the green, plankton filled water. In 2009 summer (Jan-March) was the best time for seeing mantas, however from 2010 to 2014 the winter months (June-Oct) had higher numbers. June to October is the humpback whale season and we can see these magnificent animals daily from the shore, from the boat and even on SCUBA. September and August are the peak season for humpback whales.

Water temperature.

We have collected this data from two temperature sensors that were on one of our inshore reefs during the period of the 12th July 2007 until the 18th of February 2010. These sensors have been replaced and we will continue to monitor them.
As you can see, there are some surprisingly cold minimum temperatures during the summer months. These are usually a result of upwelling's forming a thermocline, and will normally only last for a couple of days.

**Current**

The Agulhas current runs through the Mozambique Channel from North to South and as such we usually have a mild current on our offshore reefs, predominantly at the surface, although anything from zero to strong can occur. We are lucky enough to have over 7 km of inshore reef lying parallel to the shore, so on the days when the current is strong, drift diving is the order of the day.

**Equipment**

We work in partnership with several local and regional dive centres. All the boats are equipped with a GPS chart plotter and sonar sounder to provide accurate navigation and exploration. A full range of safety equipment is always on board including life jackets, first aid kits, flares and, of course, oxygen.

We highly recommend you bring your own wetsuit. The wetsuits available at the dive centers are 5mm full length/one piece. The cylinders vary in sizes 10, 12 and 15L accepting both DIN and International regulators.

For technical diving we have manifold twinsets in 2x10 and 2x12 liter configurations, mounted on backplate/harness/wing and a variety of stage/deco cylinders with regulators for decompression/bailout. We also have 2 APD closed circuit rebreathers (CCR's), one Evolution and one Inspiration, available for hire or use during courses. Oxygen and Helium can be boosted to 200 bar and nitrox and
trimix can be mixed on site. Carbon dioxide absorbent and CCR consumables are also available at our facility.

Interns using our gear will dive using a backplate/mini wing as BCDs. This equipment is slightly different from a jacket BCDs as the air cell is on your back, which helps you to maintain a horizontal position for underwater surveys.

What can I expect to see?

Zavora is a world class destination with miles of pristine sub tropical reef, much of it still to be explored. Zavora marine life is extremely rich from mega to macrofauna. Over 250 fish species have been identified to date, and our fish assessment added seventeen new species to the fish species record in Mozambique, proving that there is still lots to be discovered!

Can I study marine biology and improve my dive skills?

For those wanting to combine the internship with some quality diving education, a variety of options are available.

Novices can spend the first 2 weeks of an internship going through the Open Water and/or Advanced Open Water courses, as well as getting in some practice dives. The 3rd and 4th weeks will be focused on scientific diving.

Experienced divers wanting to get to grips with technical diving techniques and equipment can enroll in IANTD courses from nitrox to trimix as well as CCR courses on the APD Inspiration/Evolution rebreathers. Increase your dive duration while at the same time increasing your safety. Have redundant equipment so you are capable of self-rescue. Dive bubble free and silent, at one with the reef.

**MEGAFANA**

**Manta Rays**

Both species of manta ray (*Manta birostris* and *Manta alfredi*) are present all year round in varying numbers with periods of huge abundance. November to January seems to be the time that Mantas begin to engage in mating behavior, with the opportunity to see many males chasing a female in a long ‘train’ across the reef.
However, winter months (June-October) seem to be the busiest manta period with manta’s spending long periods cleaning.

**Humpback whales**

June to November is humpback season and to see these 16+ meter long animals from the boat or even on SCUBA is a real thrill. Every year we get multiple encounters in the water with these whales, and their song can be heard continuously on most dives. They are here to calve and breed so we also regularly see young calves as well as jostling bulls. The whales were observed in groups, alone or with calves and we witness some spectacular behavior, such as breaching, tail slaps and rolls.

**Sharks and Rays**

We have unfortunately seen a drop in numbers of larger shark sightings in the last 3 years, probably due to increased use of fishing nets, industrial long lining and the market for shark fins, but we do still get encounters with Zambezi, Spinner and Hammerhead sharks on our off shore reefs. We can also see Bow Mouth Guitar, Leopard, Nurse and White Tip reef sharks. Whalesharks are also present and we see these magnificent fish from time to time, more frequently in our summer months.

Mozambique was the first country in the world where a live individual of the mystical Small Eyed Stingray, the largest stingray in the ocean, was captured on film, and here in Zavora we see it occasionally. Other rays to look out for are Jenkins, Fan Tail, Shovel Nosed, Devil and Eagle rays, to name but a few.

**Sea turtles**

Five of the seven species of sea turtles can be seen in Mozambique waters. Encounters with loggerhead, hawksbill and green turtles are frequent, whilst the Olive Ridley is less common. Massive leatherbacks have been spotted in Zavora a number of times, particularly in November. From September to March is the nesting season and you might be lucky and see a turtle coming up from the water during a night patrol.
**Macrolife**

The macro life here is stunning! With over 210 species of nudibranchs recorded, 30 of them as yet undescribed, this is definitely ‘Nudi heaven’. On our top Nudibranch inshore reef, scientific data shows an abundance of 1.2 Nudibranchs per 2 square metres. That equates to a lot of sightings in a single dive!

Manti shrimps, octopus, pipe fish, gobies and many other little creatures are also often seen on the reef tops or hiding in a hole, including the rare Zavora pipefish, described from a specimen found here.

**Wrecks**

Zavora is a top destination in Mozambique to wreck dive with two stunning wrecks - The Klipfontein and the Rio Saiñas.

The wreck of the **Klipfontein** is a big draw for the technically minded diver. A 10500 ton, 160 meter long ocean liner, lying in 53 meters of water, she is more than your average wreck. Brindlebass, mantas and large schools of fish are often seen here, and there is plenty of opportunity for penetration. At 6 km from our launch, she is on the doorstep, and as no one else dives her, exclusive. Please note that diving the Klipfontein requires either previous certification in decompression diving (to a minimum of 45 meters), or as part of an IANTD Advanced Nitrox, or higher level course, conducted here in Zavora.

**The Rio Saiñas**

Our recent addition, she sank on March the 11th, 2013 and lies intact with a list to starboard in 33m of water. A 35m long steel fishing vessel, she has quickly become a stunning artificial reef, which we have been lucky enough to study since she sank. Sitting in recreational diving depth, technical divers will still get a thrill penetrating the tight but intact engine room and cabins.
HOW CAN I GET MORE INFORMATION?

Further information is available on the Zavora Marine Lab. website: www.zavoralab.com, or Mozdivers website www.mozdivers.com or by writing to yara@zavoralab.com. You can also join us on facebook, search for our pages Mozdivers and Zavora Marine Lab.