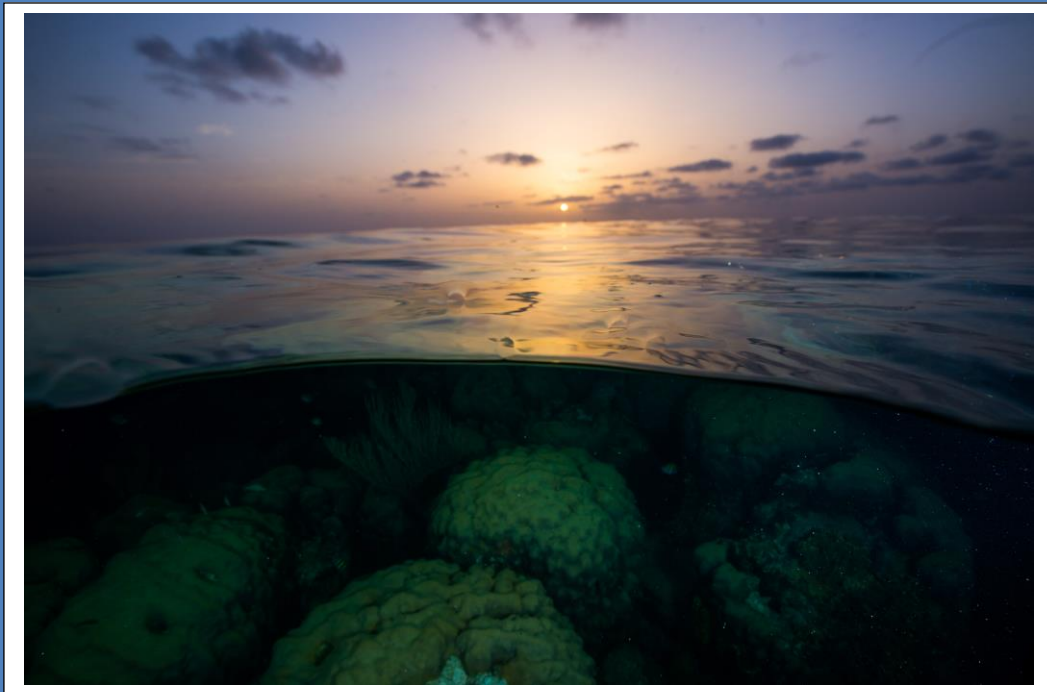
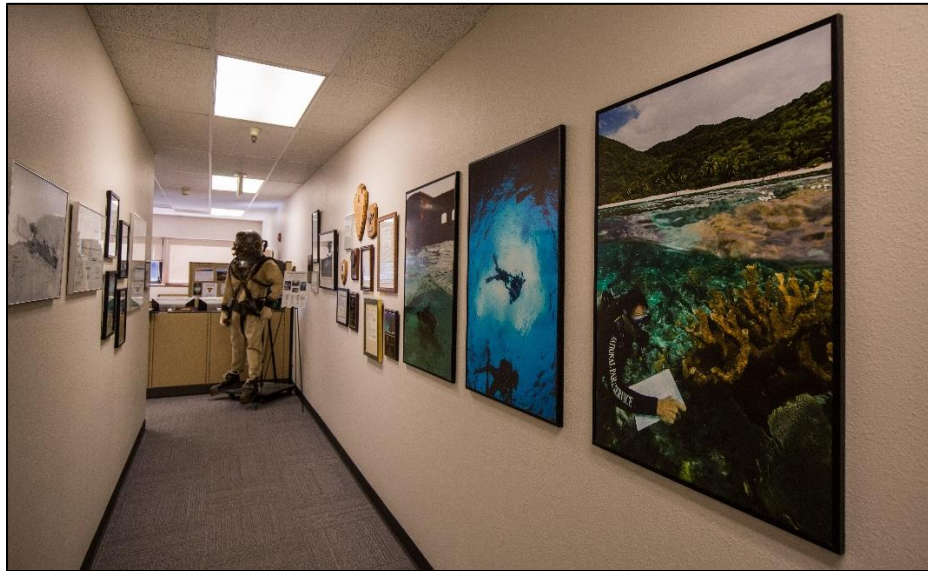


OUR WORLD-UNDERWATER
SCHOLARSHIP SOCIETY®
2019 NATIONAL PARK
SERVICE RESEARCH
INTERNSHIP FINAL REPORT



Michael Langhans

This past summer I undertook one of the wildest adventures of my life - travelling across the United States as an Our World-Underwater Scholarship Society National Parks Service Diving Intern. This almost 5-month journey had me undertaking new types of diving in wild and remote places in collaboration with 8 different National Park Units. Besides being an adventurous and dive-packed trip, this internship also completely changed how I think about my future and what career paths I plan on pursuing. A diverse and multi-faceted internship by design, the OWUSS NPS diving intern's primary directives are dictated by the interests of the intern. I had a strong interest in pursuing photographic work, as I had a background in casual underwater photography that I wanted to work on honing, so photographic assignments were a priority to me. I also had an interest in exploring some of the biological monitoring taking place throughout the Parks Service, as I studied marine science at university and have worked doing biological surveys in the past. I made those two preferences clear to some of the folks helping me plan my internship, but really had no idea how impactful of a summer I was in for.



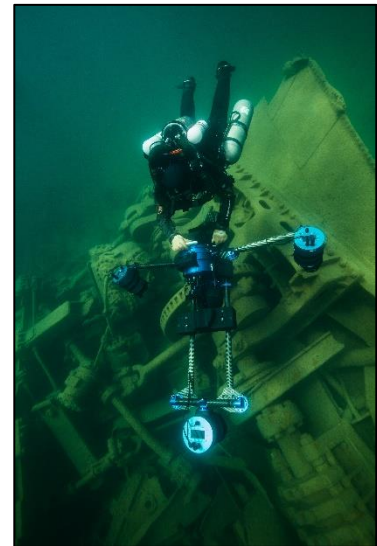
SRC Office in Lakewood, Colorado

A crazy journey like this has to have a somewhat mundane start, and I found mine tucked away in the NPS offices in Lakewood, CO. Here I met the small crew of the National Parks Service Submerged Resources Center (SRC), the branch of the NPS who would be tasked with coordinating my summer assignments. It felt a bit odd to start a grand diving journey in the mountains of Colorado, but the more time I spent getting oriented with the SRC the more suitable it seemed. Tasked with a huge amount of dive assignments across the country, these experienced divers spend most of the year on the road visiting and assisting various parks. Hearing about this travel-packed lifestyle was exciting and got me mentally prepared for my own mini-version of it. And a good thing too, as I was about to hit the ground running with perhaps my most difficult park unit first: spending three weeks staying in the remote Isle Royale National Park, working to model the shipwrecks submerged in its frigid waters.

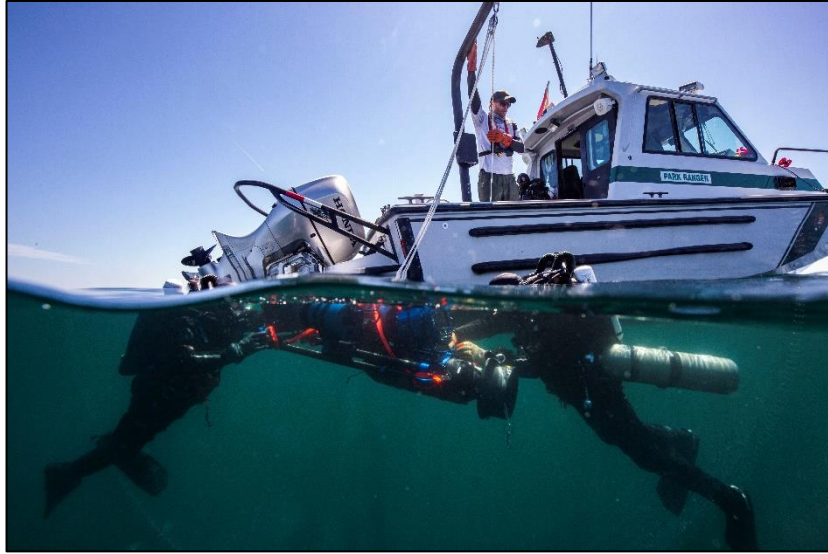


A fog-shrouded Isle Royale (center), divers exploring sunken wreckage (sides)

Isle Royale presented several challenges to fieldwork: near-freezing water, a highly isolated location, and limited resources and staff. This was an interesting park to start at because it was potentially the most technically complicated project I'd be working on all summer, in one of the parks with the most limited resources. Here, we'd be testing the capabilities of an extremely complex imaging device, a multi-camera 3D photogrammetry array, on some of the sunken wrecks around the park. Isle Royale has a limited dive team, so we attempted to be completely self-sufficient - which meant bringing in a huge amount of gear. We had loaded up rebreathers, cameras, cylinders, compressors, and the SRC's prized vessel, and driven them all thousands of miles from Colorado to Michigan for this project. We then staged tens of thousands of dollars' worth of dive gear in our make-shift dive locker (the cabin we were staying in) and prepared to transport it all to each day's dive site. I was starting off my summer with some exposure to some of the nicest dive gear I've laid my eyes on: everyone was diving closed-circuit on \$12,000 rebreathers to maximize bottom time, wearing top of the line drysuits with heated undergarments to stave off the cold, and using some of the nicest camera gear money can buy. Each day we'd set out to our dive site for the day, sometimes as close as 10 minutes away and others up to two hours. The dives were few, but extreme. With imaging the wrecks being the primary priority, the work revolved around the camera operator and their buddy, who often had a slow-paced and excruciatingly cold 2-hour dive in 36-degree water. My primary duties here were to photograph the photogrammetry array (called the SeaArray) at work and to assist in the launch and retrieval of the beast, so my dives were often a bit shorter.

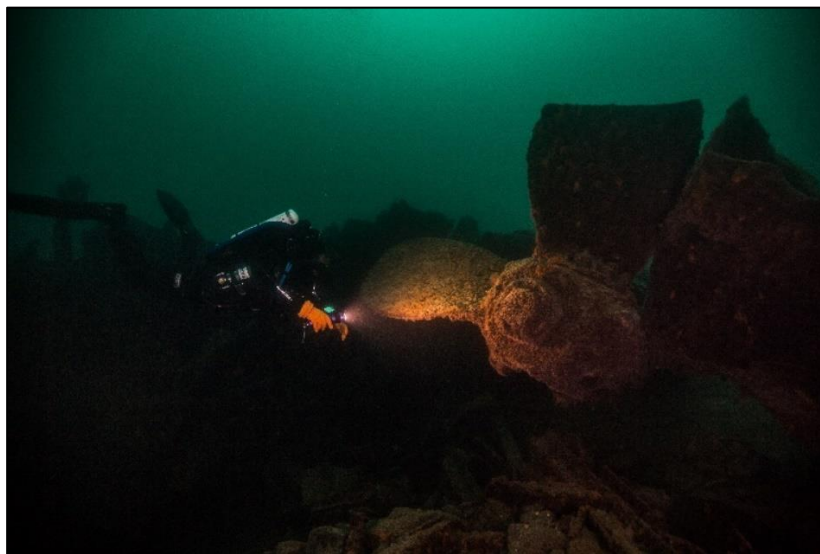


Diver operating the SeaArray



The SeaArray being deployed

After our one dive on the site, we'd start our journey back to the home base to start another crucial part of the data-collection process, the image processing. As this was primarily an imaging trip, certain members of the team would spend the last 5-6 hours of the day working through the countless images that were collected to attempt to confirm their quality. I joined in on these review sessions and quickly started learning how tiring working as a photographer can be on a fast-paced expedition like this - you're barely finished with processing the day's work before it's time to go to bed and start the next one.



Diver examining the prop of a sunken ship

While the trip to Isle Royale was primarily an imaging one, we also did a bit of maintenance diving to assist the Park in its yearly duties. This consisted mainly of swapping out and adding new buoys around the park - nothing too glamorous, but still a necessary part of park duties and something I'm thankful I was able to witness.



Replacement of a channel buoy

Isle Royale was a grand introduction to my summer with the Parks Service. I got to pursue my passion of underwater imaging in a new and big way, while also working hand-in-hand with some of the NPS's best underwater photographers on a cutting-edge photogrammetry project. As well as all of that, I got to experience how an elite NPS dive unit dives and works, learn about the intricacies of doing complicated work in an isolated and remote park, and see some of the difficulties in maintaining a safe Park Unit in wild and extreme weather. It's crazy to me to think that all this happened in one park, over a mere three weeks. Isle Royale was not only a lovely introduction to this internship in many ways, but also a very new type of diving to me. I'd only ever done one freshwater dive and one wreck dive before, so as well as informational my time at Isle Royale was also thrilling and captivating. After this I was ready for my next spot - a huge change in scenery from the foggy and cold forests of Michigan's Isle Royale - the sunny beaches and coral reefs of St. Croix's Buck Island Reef National Monument.



Diver surveying a large coral head

The work I was involved in while on St. Croix was much different than what I did in Isle Royale. I was in the Virgin Islands for part one of a two-part coral reef monitoring trip for the National Coral Reef Monitoring Program (NCRMP), a huge multiagency effort to assess the health of corals in US waters. Spearheaded by NOAA, this program also included researchers and technicians from the NPS, University of Virgin Islands, and the Nature Conservancy. All these different groups were enlisted to help for a good reason - there was a huge amount of work to do. In a short amount of time, the dive teams were to visit and collect data on hundreds of different sites around the island, meaning all hands on deck. As I had to skip the training week earlier in the summer due to a scheduling conflict, I started off the week shadowing and photographing the work underwater. Biological surveying is nothing new to me - I've spent a couple summers doing kelp forest surveys and got dive certified through a citizen science coral reef surveying program - but the waters of the Caribbean were. I had never been diving in the Atlantic, let alone the



A large plating coral

vibrant waters of the Caribbean, so I had a lot of species ID to practice while preparing myself for the data collection.



NCRMP divers working a transect line

My time in St. Croix taught me a fair bit about the complexities of organizing and pulling off such a large research effort. I was staying in a shared condo with a couple of the NOAA folks who were in charge of organizing the entire trip, so I was privy to some of the complications that go along with an effort like this - how to coordinate 6 separate groups of divers to randomly selected sites to avoid overlap and still get an even geographic coverage, dealing with relying on commercial charters and dive shops to take teams out and fill tanks, what to do when team members drop out (put your photographer to work). The many dizzying complexities of a project like this left me with a newfound respect for administrative folks who must deal with stuff like this on a daily.



A seahorse



Fort Jefferson, Dry Tortugas' own civil war-era fort

After St. Croix, I flew into Miami to meet up with my next group: the NPS South Florida Caribbean Inventory and Monitoring Network (SFCN). A group of seasoned NPS biologists and ecologists, this team covers the inventory and monitoring (I&M) demands of the marine regions of the South Florida and Caribbean Parks. I was to tag along with them while they completed their annual surveys in one of South Florida's finest parks, Dry Tortugas National Park. This team has been visiting these sites for years and know them like the back of their hands, so during this trip I was playing a supportive and photographic role. In order to aid in the speed of data collection, myself and the other SFCN interns helped set up transects so the rest of the team could speed through them. This was often a relatively quick task, so I opted to bring my camera down with me to capture some images of the sites and the science being done. The work I was involved in at Dry Tortugas with the SFCN team wasn't anything too crazy or new for me, but my time there was incredibly informational and productive.



SFCN Divers setting up a transect line and surveying corals

While spending time with these seasoned veterans of reef surveying, I was able to learn a huge amount about the perils affecting the corals of the area. These guys have been visiting these reefs for years, returning to the exact same spots to assess things like bleaching, disease, and decline of coral cover. With such an intimate knowledge of specific sites, this team helped me establish a very deep understanding of what these reefs were undergoing. It's both incredibly saddening and simultaneously powerful to see a massive coral head succumbing to the clutches of disease, and then to later have your buddy tell you that the coral is likely a couple centuries old and has started dying only a couple of weeks ago. Diving in Dry Tortugas, which is home to one of Florida's healthiest remaining reef systems, with a team so knowledgeable gave me a more thorough understanding of coral disease and threats to coral reef ecosystems than ever before. It felt like diving amongst the last of a dying breed.



A large, healthy coral colony



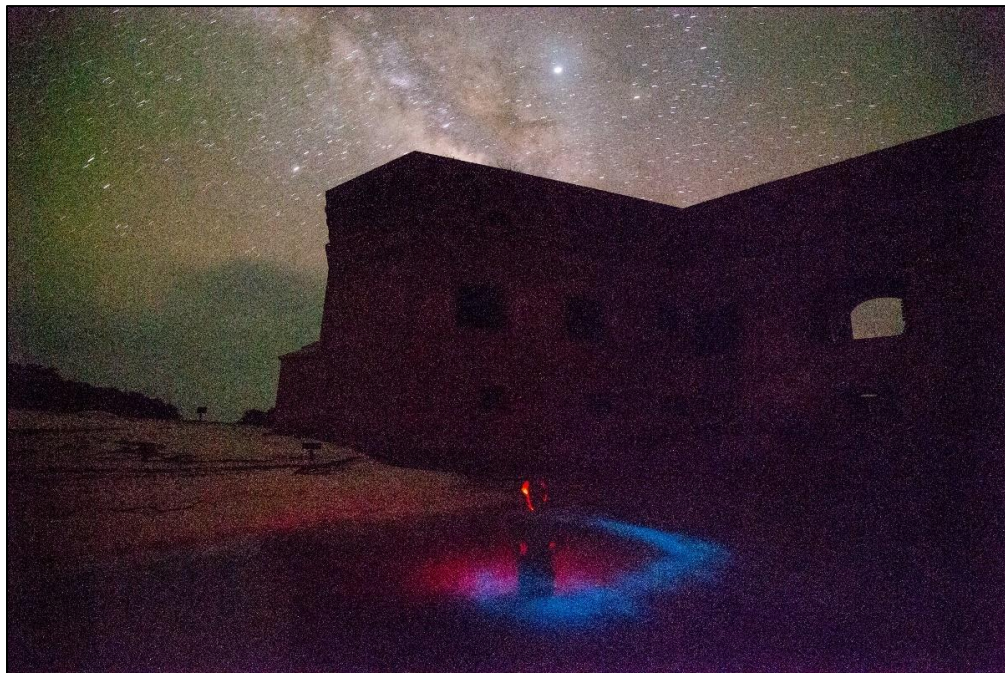
Diseased coral colonies

Along with imparting upon me a better understanding of a highly threatened ecosystem, my time at Dry Tortugas National Park also had a much lighter and happier benefit - it was phenomenal for photography. It was here that I took some of my favorite images of the summer, above and underwater. Our style of diving here allowed me lots of time to photograph the reefs once work was finished, photos which gained a new significance when realizing the very possible reality that these reefs are in a steady and permanent decline. I worked together with Jeff Miller, long-term SFCN team member, for most of these dives photographing rare corals, instances of disease, or signs of possible recovery, which felt to me like important work.



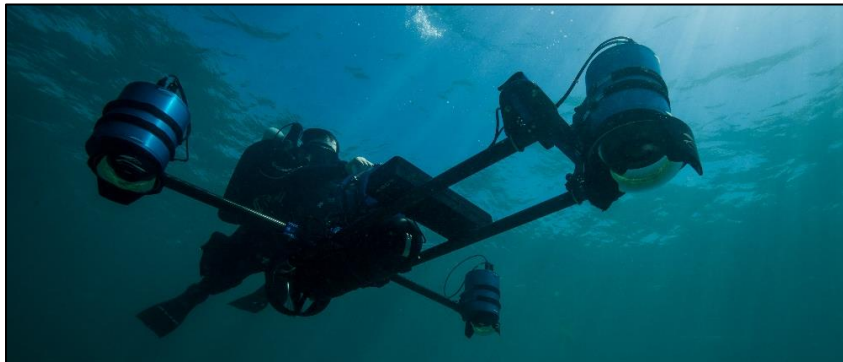
A diver examines a large healthy coral colony

Apart from photographing during our survey dives, I also had ample free time after work was over to capture the sublime scenery. Every day was action-packed with afternoon activities, be they snorkeling in the shallow waters surrounding the islands, exploring Fort Jefferson, visiting nearby islands, or going for an evening sail. It felt like there wasn't enough time to take it all in, and for each adventure I made sure to have my camera ready. It was an exhausting trip, but the best kind of exhaustion.



Long exposure of bioluminescence and stars at Dry Tortugas

After an eventful time out at sea with the SFCN team, I headed to Biscayne National Park to meet back up with the SRC for more photogrammetric modeling. We were here to model wrecks on the Maritime Heritage Trail, a curated journey through a century or so of the unfortunate maritime accidents that occurred within park boundaries. This work was very similar to what we worked on up in Isle Royale National Park, with one big difference: exposure. While up in the remote northern section of Lake Superior, it felt like we were all on our own. Working in Biscayne was very different in this aspect as it is located in a very populated area. Just south of Miami, with huge population centers nearby, there were many people interested in the SRC's work. Almost each day we had a new visitor come out with us, be that parks employees who wanted to see the SeaArray in action, local archaeologists who came out to lend a hand, or students who wanted to incorporate photogrammetry into their studies and came out to discuss that with the team. It was special to see what a wide reach this type of work could have, and nice to be acquainted with so many new people in the marine archaeology field.



The SeaArray in Biscayne National Park

As the operation of the SeaArray is really a two-person job (aside from topside support), my main objective during this work was purely photographic. I was to document the wrecks of the Maritime Heritage Trail for online resources, so was free to capture them in any way I pleased. This was a lovely and desirable assignment for me as it allowed me to get creative and really try to create unique images of these wrecks, with ample time to do so. As wreck photography was a new experience for me this summer, I really enjoyed the challenge of capturing these sites, especially with the disarticulated and sometimes visually bland appearance of wrecks that have spent years being worn and weathered by the ocean. It brought on an extra challenge in creating interesting images, one which I was happy to meet.



Images from the wrecks of the Maritime Heritage Trail

My final week in Biscayne brought on an assignment that I was simultaneously the most excited and the most nervous for: the opportunity to shoot for an article in Scuba Diving Magazine. This came to life when an editor for Scuba Diving, an old friend of the SRC's, had asked if anyone was available to photograph a program in Biscayne for an article they had planned, and by some stroke of luck that person ended up being me. Now, I've been shooting underwater for some time now and feel comfortable with my photographic and diving abilities, but this assignment still brought up some worries.



A shipwreck in Biscayne National Park

First and foremost, this was for a big-time magazine. Obviously, I wanted to create good images for it, but was slightly concerned they wouldn't live up to the expectations of a globally distributed print medium. Secondly, a lot of people had put faith in my ability, and I really didn't want to let them down. Brett Seymour and Dave Conlin from the SRC had both vouched for my ability as a good photographer, despite my feeling that I hadn't given them enough reason to believe that. The support from these two was constant throughout my internship, but I felt like this was a pivotal moment where I would either live up to their expectations of me or fail and let them both down. Scuba Diving Magazine had also put its faith in me, a wholly unknown photographer with next to no professional experience, to create images for them good enough to print. This really felt like a can't miss opportunity. Finally, the subject matter of the assignment was also something new to me - I'd be shooting people. Almost all my photographic experience has been with wildlife. I feel very much at home stalking a fish, or taking photos of a seal, but really hadn't spent much time photographing people before this internship. In theory it shouldn't be too much different, but it still felt a bit wild making my big debut into the magazine world capturing subjects I wasn't too experienced with. However, with all these worries aside, I still realized the power of this opportunity, so I was determined to do well.



Students measuring artifacts

The program I had been assigned to photograph was Youth Diving with a Purpose (YDWP), an outreach program to get underprivileged youth experience with diving, marine archaeology, and reef conservation. The members of this program and their students would be working together with archaeologists from Biscayne National Park and the SRC to create a map of one of the many wrecks dotting the Park's waters. I spent this week shooting photos like a madman - I wanted to leave no chance that I'd miss out on the shots I needed.



YDWP divers work to measure and map a wreck

It was surprisingly tiring and the days were long, but as the week progressed I became more and more confident that I could create the images I needed. This was an empowering feeling, it seemed like proof that I could live up to expectations and deliver what was needed. For a while I didn't have much faith in myself as a photographer, I had some images I liked but always felt as though things weren't good enough. I'd never describe myself to someone as a

photographer, that felt like a word reserved for the professionals. This assignment changed that. It was during this week that I really started to think that maybe I was good enough for work like this, and that maybe I could actually pursue this dream as a career. These feelings grew and grew throughout my internship, but really started to take root during this final week at Biscayne. The gaining of that self-confidence was powerful, and I would say is one of the biggest personal impacts from this internship.



Cruz Bay in St. John

After that transformative final week in Biscayne, I was off to St. John to visit Virgin Islands National Park for another leg of the NCRMP. While identical in design to the work done in St. Croix, this part of the internship was different for me as it was the least photographic leg of my summer. Here, I was an integral part of the data collection, which was both a blessing and a curse. I do love biological surveying, so it was nice to go back to my roots and felt almost like an 'easy' type of diving, where I wasn't worried about creating striking images for someone. On the flip side, I still really wanted to take photos. It was hard at times for me to see these beautiful creatures and sights and to have no good way of capturing them, especially after spending the past couple months diving almost solely with a camera. About halfway through the trip, I realized that not only would I have no underwater photos of St. John if things continued like this, but I would also have a very bland blog entry - neither which sounded like a good option. I opted to bring my camera along for the rest of the trip, and just dealt with a bulky camera strapped to me while I surveyed for a chance at a couple photos.

While the work done in St. John was identical to that in St. Croix, it felt different to me for a couple reasons. I was here for two weeks versus the one I spent in St. Croix, so I was able to experience the entire survey trip, and I was working with people I had spent time with previously (through the St. Croix leg or from the Dry Tortugas), so I felt much more integrated in the group. I also spent the entire trip collecting data versus only two days collecting data in St. Croix, so I had to deal with a small section of the data processing as well - data entry. For NCRMP, the data was to be entered before the trip had ended, which meant that the work wasn't finished even when the diving was. I found this slightly difficult to balance amongst all the various internship duties I had but managed in the end. All this aside, my main takeaway from my time in St. John was how such a large-scale data collection effort happens. I was slightly privy to this in St. Croix but my extended stay in St. John and the volume of dives I did really drove it home. It takes a lot of diving - our team (1 out of 6) would do 5-8 dives a day, 5 days a week, for two weeks straight. We still had to deal with the logistics of preparing for extensive dive operations on a small island - filling up 30+ tanks with air a day at a local dive shop, commuting between islands daily to get nitrox fills, hauling gear to and from a remote 'dive locker' that had been vanquished by recent hurricanes. It really takes a colossal effort, and it was impressive to see it all come together.



Elkhorn coral



Some of the beautiful underwater sights of St. John

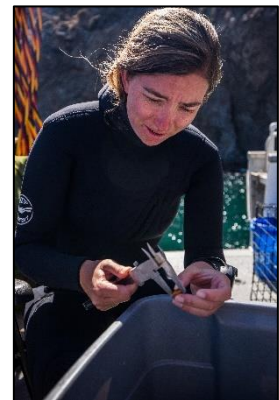
After St. John, I flew back across the country to spend some time in my favorite ocean, the Pacific. I was to join up with Channel Islands National Park for one of their biweekly kelp forest surveying cruises. I had been looking forward to this for a couple of reasons. I absolutely adore kelp forest diving and know my species well, as I had spent the previous two summers working for a subtidal marine protected area monitoring program in California. I had also heard a lot about this program through colleagues who had worked for it and have considered applying for it previously, so I was looking forward to getting some first-hand experience. Overall, I was excited for some California diving and was looking forward to being able to be a productive member of a team. While every Park I visited was very gracious and welcoming, I didn't always feel as though I was always really useful - often I didn't think I had much to offer apart from producing some nice photos for them to use, as it would take time that I didn't have

to get me trained up to really pull my weight. Here, however, with my familiarity with the system and species, I felt as though I could really be a benefit to the team and was excited to help.



A kelp forest at Santa Cruz Island

As soon as the team had gotten underway and left the harbor, it was clear how tightly knit and well trained everyone was. The Channel Islands Kelp Forest Monitoring team spends every other week at sea, living and surveying off a live-aboard research vessel. This allows them to really commit to the work and to complete the countless survey types they do to get a comprehensive understanding of the subtidal ecosystems surrounding the islands. I had yet to learn the extent of their monitoring program but would shortly become privy to the many types of data they collect - everything from percent cover, to fish and invert abundance and size structure, to acoustic hydrophone data. It really is a mind-boggling amount. As I had hoped, my kelp forest surveying experience was acknowledged and I was quickly put to work counting algae and select invertebrates. As I had realized in St. John, my eagerness to collect data and be helpful was quickly matched with my desire to capture photos, but thankfully the KFM team was understanding of that and gave me a couple opportunities to leave the slate and data sheet on deck and dive in with my camera.



A KFM team member measures invertebrates



Some of the fish life in the kelp forest

During my time on the islands I really got a good idea of everything that the KFM crew does to try and protect the islands. They collect such a huge magnitude of data in order to keep a close eye on such a heavily impacted marine ecosystem, and their work is used to inform management decisions that can have crucial influences on the marine environment. Kelp forests, much like coral reefs, are facing a slew of damaging shifts and changes in this modern age so it's even more important for this type of work to keep a close eye on everything that's going on in our marine forests. I also got to experience how much of a well-oiled data collection machine this group is. Spending so much time together in close quarters pretty much forces a group to either mesh or clash, and I was delighted to see this team meshing happily. They worked all day counting, measuring, and identifying various creatures and never seemed to tire of the work or each other's company, which was really nice to see. Despite only joining them for a short few days, I felt quickly accepted into the group and treated as one of their own.



A lighthouse on Anacapa Island

To me, the Kelp Forest Monitoring Program at Channel Islands National Park seems like the pinnacle of biological surveying in the National Parks Service. With such a long-running dataset and such a diverse array of survey types, this program is thorough and committed to the protection of a special and heavily impacted place. I was happy to spend a trip with this crew, even if it was only a short four-day stint. It was encouraging to watch them

work as hard as they do to protect some of California's special places. After spending time working with one of the Parks Service's largest and most established monitoring program, it was time for me to join another, much smaller program: Kalaupapa National Historic Park's marine team for their yearly inventory and monitoring surveys.



Sunset at Kalaupapa

Kalaupapa National Historic Park was unique in a couple ways. This place is seriously remote, located on the sparsely populated north shore of Molokai and only really accessible by boat or plane, which dictates a lot of how things run. It's also very small, rarely getting visitors and only having just enough staff to run things. I joined up with a small team to take care of the yearly marine inventory and monitoring surveys, which keep an eye on a subset of permanent and randomly generated sites in the ocean surrounding the small peninsula that makes up the Park. Here, I was joining a team of three others – only one a permanent employee of Kalaupapa NHP and the others working wholly or in part for the I&M program – to complete all the work to be done. A team of four may seem rather small but stands to be the perfect amount for completing the desired sites.

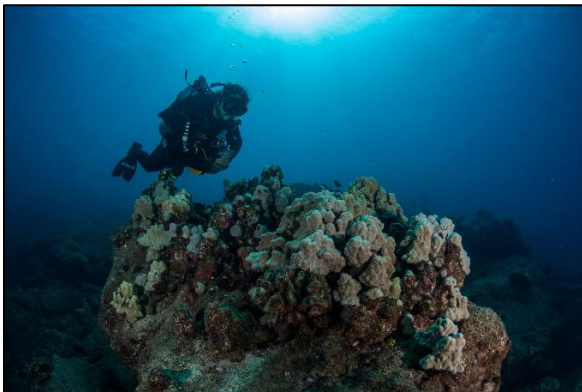


Taking water samples



Measuring rugosity

Kalaupapa takes safety very seriously, and deservedly so. Working out on the water here can potentially be very dangerous – one side of the isolated peninsula is often subject to high winds and swells, and the remote location means that any help you might need would probably be coming from a different island. The Park only owns one vessel, the one that we'd be using, so we couldn't rely on a quick pickup by Park Law Enforcement or anything like that. Safety precautions, like redundant marine radios or obsessive life vest wearing, were not neglected. Apart from the difficulties associated with working in such a rugged and remote location with minimal surface support, the marine surveys themselves were straightforward. My job would either be to take photo quadrats of benthic cover or to measure rugosity, each giving me ample time before or after to have a little photo time.



Marine life on Kalaupapa's reefs

Kalaupapa itself was a stunningly beautiful place. Once the diving was done for the day, my obligations were minimal which gave me lots of time to explore my surroundings. Much like the Dry Tortugas, this small Hawaiian peninsula is a highly photogenic place and I spent many happy hours exploring on and photographing parts of it. In some of my time above the water, I joined the Park for one of my few non-diving jobs during my internship – monk seal surveys. For these, we would walk along the entirety of the west side of the Kalaupapa peninsula,

taking note of any seals that were seen. This beach is one of the most popular locations for these endangered seals in the main Hawaiian Islands, and I felt lucky to be able to observe them from such close quarters.



A monk seal sleeping at sunset

After spending a couple weeks out on this little peninsula, I was able to see how hard even some of the smallest parks work to survey their marine environment. Kalaupapa NHP is small, isolated, and hard to work in but still takes the time needed to monitor its surrounding reefs. It was impressive to see all the extra steps necessary to get work done at a park like this, where seemingly every task is a little more difficult than it could be. This data stands to be very useful as well – this is one of the least impacted coastlines of all the main Hawaiian Islands due to its remote location and is home to healthy fish and coral populations. Thanks to the hard work of Kalaupapa NHP and NPS I&M, researchers can now compare this data with that of more heavily impacted nearby islands to learn about various human influences.



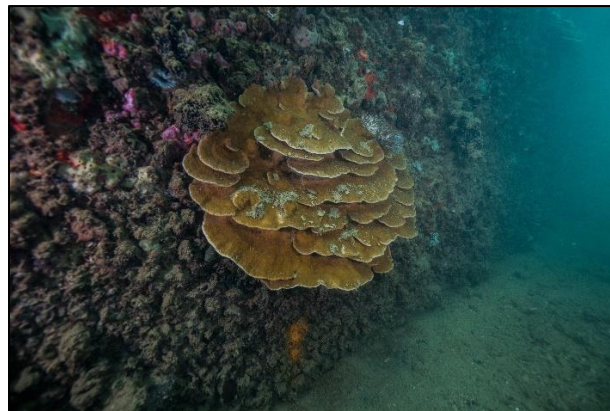
Historic resident housing at Kalaupapa

While these marine surveys were the main reason why I was here, the coral reefs are not at all why this park exists. Kalaupapa is a National Historic Park, the only one that I visited during my internship, meaning it was created to protect a site of cultural significance. In this case, that site is the entire peninsula. Many years ago, Kalaupapa was chosen as the location of a colony for patients with Hansen's disease, or leprosy. These unfortunate people were uprooted from their daily lives and essentially imprisoned indefinitely, many unable to ever leave. After a cure for the disease was developed the quarantine was lifted, but many patients, who had spent most of their lives on the peninsula, chose to stay. Years later, the area was designated a National Historic Park, to preserve the story of those who suffered, struggled, and lived there. The peninsula is still home to a few of these patients, who remain there with their families. The land is essentially governed by those last residents, allowed to dictate the rules to their home once the mandatory isolation was lifted. Resultingly, tourism is limited in order to maintain the land as a peaceful and unexploited one for those residents remaining. I felt fortunate to be able to visit such a unique place, and grateful for the opportunity to see how the NPS works here to preserve a storied history and how they aimed to preserve the land as its residents desired. This type of preservation was one I had never really imagined the Parks Service doing but was pleased to learn about.



The USS Arizona Memorial

After Kalaupapa, I was heading to a neighboring Hawaiian Island to visit what was perhaps my most unique park unit of the summer – the Pearl Harbor National Memorial. Like Kalaupapa, this place was created to preserve a historic site, which in this case is the site of the 1941 attack on Pearl Harbor. The memorial focuses primarily on the wreckage of the USS Arizona, a sunken battleship that took more than 1100 sailors down with it. This site, along with the wreckage of the USS Utah which rests in the harbor near the Arizona, is managed and maintained by the NPS. I was to join this small dive team for a couple of days to dive on both the Arizona and the Utah, a very rare diving opportunity that I was excited for. Diving on these vessels happens only a few times a year, so I felt lucky to have an opportunity to dive them both. Here I was being utilized for my photographic abilities, with two different tasks. On the USS Utah, the quieter and less-visited cousin of the famous USS Arizona, I would be photographing and documenting the process of changing out a marking buoy. These photos would be useful to the Parks employees later when training future divers. The Arizona presented a new task, one right up my alley – I'd be photographing biological life on the ship, for the Park to use in outreach documents. This type of photography is my favorite, so I was especially excited for this assignment.



A large coral growth on the USS Arizona

Diving on these ships was unlike anything I had ever experienced. Initially, I didn't really comprehend the history of the site I was diving. I was occupied with keeping an eye on buddies and not getting lost navigating the mangled battleships in dark and murky water, as well as my photographic assignments. This all took precedence in the moment, leaving the realization that I was diving on what is essentially a war grave for later. After my first dive on the USS Utah, it took me until I was out of the water looking out on the ship from shore to really comprehend it, when I read a sign about the 58 men who never made it off – a pretty haunting realization, but nothing to what I'd experience later on the Arizona.



The USS Utah

Diving the USS Arizona brought on an onslaught of feelings. I was nervous for what would be a once-in-a-lifetime dive, excited to visit a ship this large, distracted by my photographic assignment, and humbled by the historic significance of the site. During my time on the ship I tried to keep my mind on my assignment, but it was impossible to not be taken by the knowledge of what you're swimming over at times. The site has been wonderfully preserved by the NPS, so the deck is still littered with artifacts that have remained there for almost 80 years – old boots, cooking supplies from the galley, bullet shells. Running into things like these demanded a brief pause and reflection, forcing one to think of the events that unfolded here. I enjoyed my assignment of photographing the life, eagerly accepting the challenge of making encrusting invertebrates and sea cucumbers look interesting to people apart from marine scientists but couldn't help but be slightly overwhelmed by where I was. In limited visibility it's tough to fully comprehend what exactly



A hatch on the USS Arizona

you're diving on, until jarringly recognizable objects like huge guns or hatches to below deck materialize right before you. This was a striking experience, and one that I'll remember for the rest of my life.



14-inch guns on the USS Arizona

Pearl Harbor National Memorial was a unique spot in terms of Park units. Designated to protect a war grave, this site protects the memory of a difficult time in our nation's past – a surprise attack which propelled our country into another world war. The National Parks Service does a wonderful job in presenting this memorial to the public in a way that fosters both reflection and education. Following my visit to Kalaupapa, this park was a fitting end to my travels, showing how the federal government works to preserve and present historically significant public sites to the people. Now, it was time for me to travel to the Department of the Interior in Washington D.C. to present a bit of what I learned to some of the people who made it all possible.



The Washington Monument

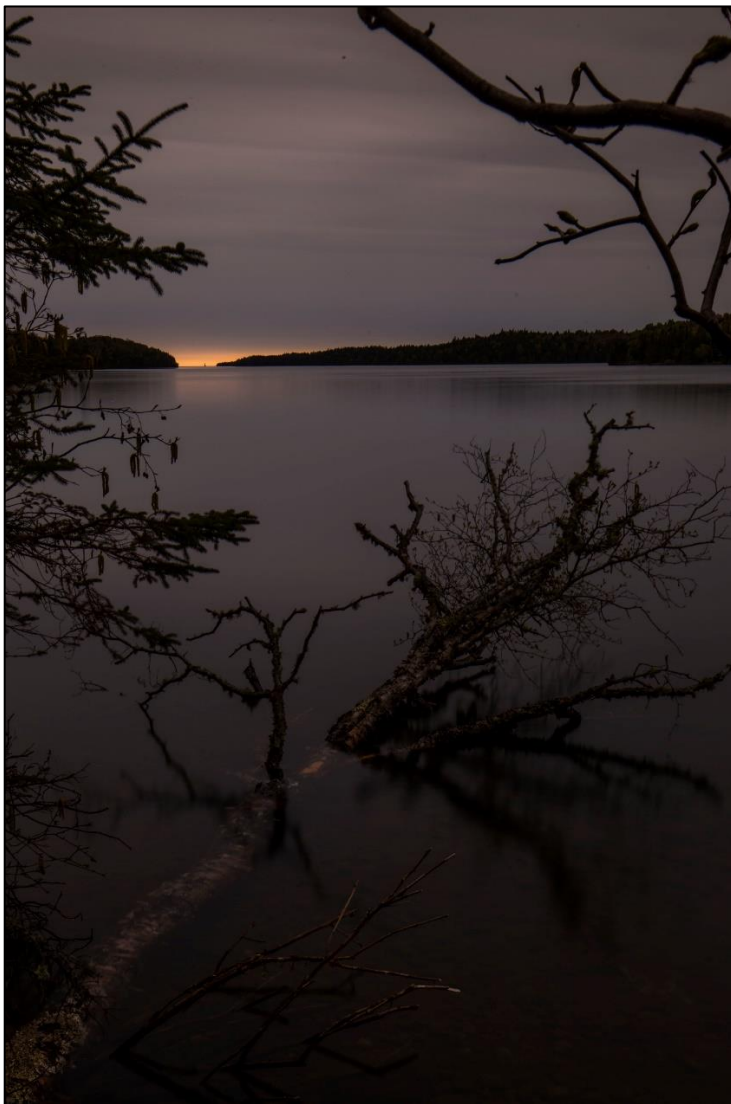
The D.C. portion of the internship is different from the other stops. There's no diving there, no beautiful underwater environment to explore. In D.C., the intern goes to present on their summer, to show some of the upper management of the Parks Service a little of what they're funding and to give them a brief overview of the types of work going on out in the field. Not the worlds finest presenter, I was a bit nervous for my public speaking debut in the nation's capital, but in reality, I had little to worry about. I did two presentations to small groups of DOI employees and directors, each of which went much better than anticipated. The audience was engaging and interested, punctuating my presentations with lots of questions. In the end, I enjoyed the opportunity to share a bit of what I'd experienced over the past few months with some of the people who've worked behind the scenes to help it all come together. It was a nice way for me to recap everything I went through over the summer while also sharing a bit of the wonder with others.



Visitors overlooking the Reflection Pool

Throughout the months that made up my internship, I went on 201 dives, adding up to 138.36 cumulative hours underwater (almost 6 days!), in waters around the country ranging from 36-90 degrees Fahrenheit. Across these dives I got to experience a diverse array of the science, maintenance, and outreach that occurs in the waters managed by the NPS – experiencing stuff that was wildly new to me and stuff that was comfortably familiar. I travelled more than I ever had in year, flying up to 15 separate flight legs and staying in 24 different lodgings. This itself was a learning experience, and I got more than my share of newly discovered travel tips and learned a lot of what not to do. Alongside all this, I think the most impactful part of my summer for me was my growth as a photographer. That was a big personal goal throughout my internship, and thanks to the support of the Submerged Resources Center, Our World-Underwater Scholarship Society, and the many Parks and affiliated groups I worked with, I'm proud to say I've learned and grown a huge amount. Over my internship, I created over 665 GB of photos and videos, including some of my favorite images to date. This is not something I take for granted, and I am immensely grateful for the

opportunity provided to me. After this summer and the experiences I undertook, I finally feel as though I can pursue underwater photography as a full-time career, something that I never really imagined would be possible and that I am very excited to follow through with. Aside from this growth as a photographer, my personal feelings of self-worth have drastically increased as well. Before this past summer, I'd spent many hours shooting underwater but never really considered my work as much more than a casual hobby. I didn't really consider my images worthy of any professional application and would never have considered marketing myself as a photographer. After all this, those statements are no longer true. That aspect by itself, the confidence in my personal ability to succeed in the things that I care most deeply about, is perhaps the most powerful benefit I've gained from this internship.



A cloudy sunset at Isle Royale National Park

Acknowledgements

This experience undoubtedly changed my life for the better, so thank you so much to all who helped make it possible. Throughout this internship I've felt the support of countless individuals, but none more so than the SRC's Brett Seymour and Dave Conlin. These two men have been there for me from the absolute beginning, doing everything they could to ensure I had a fulfilling and productive journey. I could not be more grateful for the constant glowing support they've put forward towards my photographic and diving ability, something which opened new doors for me and helped me believe in myself. I also feel lucky to have spent so much time with the rest of the SRC, especially Jim Nimz, Matt Hanks, and Susanna Pershern. These people really helped me feel welcome and at home at the beginning of my internship, and I feel fortunate to be able to have spent time with and to learn from such talented individuals. I deeply appreciate those who took a chance on my photographic ability and brought me into their programs, especially Kim Edwards and Mary Frances Emmons. I'm thankful for all of the Parks and programs that hosted me in some way or another over this journey – Isle Royale, St. Croix's NPS and NCRMP workers, Dry Tortugas (especially SFCN and the crew of the Fort Jefferson), everyone who I had the pleasure of working with in Biscayne, all of the friends I made in St. John, Channel Islands' phenomenal KFM team, the really lovely folks at Kalaupapa and Pacific Inventory and Monitoring, Pearl Harbor's Scott Palowski and Eric Brown, and Washington's Cliff McCreedy. None of this would have been possible without the support of these groups, many of which support this internship and its intern yearly. I'd like to extend a special thanks to SFCN's Mike Feeley, who has been one of the most consistent and avid supporters of this internship across the years and who constantly pushed to let me take photos and vouched for my photographic ability throughout our time together. I'd also like to thank the past OWUSS NPS interns, many of whom gave me excellent advice and helped me prepare for this. Special thanks to Shaun Wolfe, who as well as being an excellent resource and a good friend, also acted as the intern coordinator. Finally, I'm eternally grateful towards the entire Our World-Underwater Scholarship Society team – everyone who worked to review my expense reports, coordinate and organize this internship, and to do everything that you all do to make a crazy experience like this possible. This entire internship was a group effort – without the assistance, faith, and support of the countless people who helped, none of this would have happened – and for that I will be forever indebted.
