



SEE WHAT OTHERS CAN'T
Volume 1, Issue 1

Welcome to ARIS in Action!

This is ARIS in Action, in which we will highlight the adventures of our customers using ARIS around the world. We'll show you what our customers have been up to, share their industry knowledge, and keep you up to date with the latest advancements in ARIS technology. But most importantly, we want to hear from you. Don't hesitate to reach out. How has ARIS helped you? Send us your story! New to ARIS sonars but interested? We'll make it our priority to work with you to examine your project in your specific industry and ensure that you have the right tool for the job.

So don't hesitate to [contact us](#), we're here for you!

Sincerely,
The SOUND METRICS Team



SPOTLIGHT STORIES

ARIS Aboard Aquarius



Fabien Costeau's Mission 31 Requests ARIS for Cutting Edge Ocean Research
[Read More.](#)

Saving the World's Largest Salmon



ARIS Explorer 3000 Used by Conservationists to Study the World's Largest Salmon Species
[Read More.](#)

Search & Rescue in South Korea



SOUND METRICS Provides On-Site Assistance to South Korean Ferry Recovery Efforts
[Read More.](#)

IN THIS ISSUE

- Welcome to ARIS in Action!
- ARIS Aboard Aquarius
- Saving the World's Largest Salmon
- Search & Rescue in South Korea

QUICK LINKS

- [Send Us Your Story!](#)
- [Company Website](#)
- [About ARIS Explorer](#)
- [Contact Us](#)

CONNECT WITH US!



soundmetrics.com 11010 Northup Way Bellevue WA, 98004 [425.622.3001](tel:425.622.3001)

ARIS Aboard Aquarius

Fabien Cousteau's Mission 31 Requests ARIS for Cutting Edge Ocean Research



This summer, Sound Metrics received the exciting invitation to join Fabien Cousteau's Mission 31 by providing ARIS and DIDSON sonars for a pioneering ocean research expedition aboard Aquarius, the underwater research lab operated by Florida International University.

Mission 31 was a groundbreaking underwater study led by Fabien Cousteau, grandson of Jacques Yves Cousteau, the famous French explorer who created the first marine living environments for humans and led the first successful extended study on the ocean floor. Mission 31 celebrated the 50th anniversary of Jacques Yves Cousteau's study while taking underwater research to the next level. For 31 days, Fabien and his team of students successfully undertook the longest underwater study ever recorded at 60 feet below the surface, one day longer and at twice the depth of Jacques Yves Cousteau's original mission, all the while broadcasting the mission's daily activities 24/7 over multiple new media platforms to make their studies readily accessible to the public.

The mission began on June 1, 2014, as Fabien Cousteau and his team



Pictured above: An outside view of Aquarius, and the ARIS Explorer 3000 employed on the ocean floor



submerged for their month-long period of ocean research aboard Aquarius, the world's only currently existing underwater laboratory. Located near the coral reefs in the Florida Keys National Marine Sanctuary and operated by Florida International University, Aquarius allows for unparalleled up-close marine observation.

Earlier in May, Dr. Kevin Boswell, Science Advisor at Florida International University (FIU), contacted Sound Metrics Corp on behalf of the Mission 31 team with the invitation to join the mission by providing sonars to aid their research. Sound Metrics provided both a DIDSON DH (Diver-held Sonar) as well as an ARIS Explorer 3000 to be employed on site to collect data on

“We were very fortunate to have the ARIS and DIDSON on this mission in order to do things with acoustic technology that most of our peers don’t.”

- Dr. Kevin Boswell

habitat dynamics, specifically that of preyed-upon fish species whose survival is critical to the health of coral reefs.

Adam Zenone, a graduate student at FIU performing his thesis on marine acoustics and an aquanaut who worked closely with ARIS during the mission, provides an excellent description of the research ARIS was used for below:

“Overfishing is frequently regarded as one of the greatest threats to the health of coral reefs. Healthy stocks of algae-eating fishes crop algae on reefs and recycle nutrients to keep reefs in coral dominated states. While it is becoming increasingly

**Pictured above:
Student aquanauts,
Adam Zenone and
colleague, using the
DIDSON Diver Held
during Mission 31**

well known that overfishing of herbivorous fishes can instigate shifts from coral to algae dominated reefs, we currently still do not understand the role large predatory fishes play in maintaining healthy coral reefs.

Worldwide, large predators such as grouper are often heavily targeted by fisherman for both food and sport. In many environments, the loss of such large predators can trigger drastic changes in the environment. Predators not only impact the environment through the consumption of prey species, but can have indirect effects that far exceed the body count of the prey consumed. For example, the reintroduction of wolves into Yellowstone National Park has initiated an environmental recovery that goes far beyond the wolves and elk that they eat. Rather than direct mortality, the fear of being eaten has driven elk to change the areas where they forage, allowing for the recovery of the parks previously declining aspen trees. From grazing herds and lions in the savannahs of Africa to snails and crabs along the shores of the Northern Atlantic, these “landscapes of fear” that predators can create have been shown to regulate the feeding grounds of a myriad of animals across the planet. However, the effects of large predators on coral reefs are as of yet unknown.

To investigate how predators shape the behavior of reef fishes, the first portion of our research utilized model predators and cutting edge hydro-acoustic technology including the Kongsberg M3, and Sound Metrics ARIS. Deployed from Florida International University’s Medina Aquarius underwater research habitat, we placed highly desirable food sources across the reef in the presence and absence of model Black Grouper, an important but depleted game fish. To monitor changes in the behavior and feeding patterns of resident herbivores, the ARIS imaging sonar continuously record fish behavior in the area. With the imaging sonars, data could be collected under all conditions, and also allow for an unprecedented window into the behavior of fish at night. This data, coupled with detailed observations about food consumption, will allow us to understand how herbivorous fishes balance foraging decisions with the risk of predation and better understand the role of predators on reefs.”

Boswell, who is also an experienced DIDSON and ARIS user currently working with FIU’s underwater acoustic program, remarked on the significance of having Sound Metrics acoustic technology alongside the team’s optic cameras. In addition to collecting continuous data through varying conditions, employing acoustic sonar cameras provided better depth perception. “While you may be able to see things visually underwater, you can’t necessarily quantify them. You can tell that there’s a fish in front of you, for example, but how many fish are behind that fish? The acoustic sonars were able to measure this.” he explained.

“We were very fortunate to have the ARIS and the DIDSON on this mission in order to do things with acoustic technology that most of our peers probably don’t.” Boswell added. “The latest variation of the ARIS, especially the resolution, and phenomenal distance when compared with the older DIDSON, is amazing.”

While performing their research, the Mission 31 team enabled ocean enthusiasts of all ages to enjoy and learn about Sound Metrics sonars and their work aboard Aquarius. For example, Aquarius residents regularly scheduled interactive sessions with school classrooms via Skype, during which they could show students their underwater surroundings and the equipment they were using. Boswell described the exciting 'aha moment' seen on young students faces as they made the mental connection between what they understood about sound waves and the application of ARIS technology.

Overall, everyone involved in Mission 31 agreed that the expedition was a huge success in both ocean habitat research as well as exposing the public to the human-ocean connection within the lens of marine exploration. We were honored to provide acoustic sonar imaging to Aquarius with DIDSON and ARIS, and look forward to bringing similar assistance to other ocean explorers looking for the best technology available to keep marine habitats healthy and sustainable.

Saving the World's Largest Salmon

ARIS Used by Conservationists to Study the World's Largest Salmon Species



What exotic creature grows up to 2 meters (about 6 feet) long and over 50 kilograms (100 lbs.) in mass, is nicknamed the “river wolf”, and lives in the icy waters of Northern Japan and Eastern Russia? Known as Sakhalin Taimen, or locally as Hucho Perryi, this ancient and little-known species is the largest salmonid in the world, and occupies a unique ecological niche.

Pictured above: Dr. Rand holding the ARIS Explorer 3000, and a shot of the salmon sampling site on the Sarafutsu

Due to overfishing and land use development of its native habitat, the species has been declared critically endangered by the International Union for Conservation of Nature (IUCN). The Taimen’s long and complex life cycle as well as its small population size has made previous study of the species difficult, leaving major gaps in our understanding of the Taimen and how to ensure their survival.

That is why Dr. Peter Rand, Senior Conservation Biologist at the Wild Salmon Center for the conservation of salmon ecosystems, and his colleague, Dr. Michio Fukushima at the National Institute for Environmental Studies, Japan, have been conducting studies of the Taimen species up close in Japan's Sarufutsu River during the spring of both 2013 and 2014.

Located on the Northern tip of Japan, the Sarufutsu is one of the few last untampered Taimen habitats in the world, where the Wild Salmon Center currently works together with several local partners with the twofold goal to research and also increase awareness for the endangered species. This past spring, Dr. Rand conducted a 3-month study using Sound Metric's ARIS Explorer 3000 to establish a new monitoring system in order to count sea-run Taimen and estimate the current size of the river's Taimen population.

Dr. Rand, an aquatic ecologist with 20 years of experience in teaching and conservation efforts, described how a transition was made from more rudimentary equipment to Sound Metrics' multibeam acoustic sonars for more accurate study of Taimen in the Sarufutsu. A committed group of volunteers originally used to walk up and down the river counting salmon and their nests by sight. However, volunteer estimates were necessarily rough, as it takes a trained eye to spot Taimen nests, and it is nearly impossible to keep an accurate salmon count during stormy weather or at night.

“I collected much better, higher quality data using the ARIS... I was very impressed with the interface and analysis, it did a great job overall.”

- Dr. Peter Rand

With the use of Sound Metrics' sonar technology, all of these problems could be solved while saving additional volunteers time and effort. Dr. Rand first employed a DIDSON multi-beam imaging sonar last spring of 2013 for his Sarufutsu studies, and was immediately impressed with the quality results and intuitive nature of DIDSON. He had worked with more simple single and split-beam systems in the past, but DIDSON technology allowed him for the first time to take video images of the Taimen while collecting



Pictured above: A male and female Taimen swimming along the Sarufutsu River

detailed data analytics on the images as well.

This year, Dr. Rand reached out to Jeanne Dorsey, Sales Representative for Sound Metrics from Ocean Marine Industries, to inquire about using a sonar for a second time. We were happy to assist in his conservation efforts, and Ocean Marine Industries provided Dr. Rand with Sound Metrics' latest sonar model, ARIS Explorer 3000, at a substantially reduced rental rate for the duration of his project.

Dr. Rand found his preferred tool for the job with the ARIS 3000, saying that he noticed a marked improvement the ARIS makes in image resolution over DIDSON, "I collected much better, higher quality data using the ARIS, as well as more accurate length estimates of the salmon." He also spoke highly of the ARIS software, saying "I was very impressed with the interface and analysis, it did a great job overall." Dr. Rand now feels very confident in identifying the Taimen from other salmon species in the river, distinguishing between male and female Taimen, and in the final salmon count reached at the end of the study.

The final number of Taimen counted came in at a very promising 425 salmon, which was much higher than what Dr. Rand and his colleagues anticipated, and up from last spring's count of 335 salmon. Though these numbers bode well for the health of the Taimen population in the Sarafutsu, Dr. Rand and his team know that their job to raise awareness for this large and ancient species has only just begun.

The next steps are to work with the local conservationist group to educate anglers and the local community about the Taimen. Anglers represent an important audience to reach due to recreational fishing pressure on the endangered salmon, especially in Japan where there are no fishing licenses required and no official fishing regulation. Based on their research, Dr. Rand estimates that this spring's study sampled about a third of the Taimen population in the Sarafutsu. "So multiply our final count of 425 fish by 3 and you get roughly 1,000, which is exactly how many Taimen a recent survey revealed are caught and released in a year for recreational purposes."

According to Dr. Rand's study, the Taimen population in the Sarafutsu is large and healthy, but also at risk from recreational fishing pressures. The Wild Salmon Center will continue to work with their partners in Japan to communicate the status of the species to local communities, as well as educate anglers on the best practices to use when fishing for Taimen, such as using fish hooks without barbs and keeping the fish in the water when they have been landed.

Dr. Rand sees this spring's study as a success enabled by ARIS, Sound Metrics' latest up-close acoustic sonar for underwater imaging. He and his colleagues in Japan and at the Wild Salmon Center look forward to continuing to build strong programs protecting the health of the world's largest salmon not only in the Sarafutsu but in Taimen habitats everywhere. We look forward to seeing all that they and ARIS can accomplish together!

Search & Rescue in South Korea

SOUND METRICS Provides On-Site Assistance to South Korean Ferry Recovery Efforts



Soon after the tragic sinking of the MV Sewol, a South Korean ferry en route from Incheon to the island of Jeju on April 16th, 2014, Sound Metrics Corp took an active involvement in providing assistance to South Korea's recovery efforts.

The Japanese-made MV Sewol was carrying 476 passengers, most of them high-school students, when it capsized in what should have been a routine trip from the city to a holiday island. As a result of a delay in initial rescue response, 288 people died, 172 were rescued, while 16 others are yet missing.

Jeanne Dorsey, Sales Manager for Sound Metrics Corp, was contacted on May 2, 2014 by Anna Jo, an International Cooperation Representative from the South Korean Ministry of Oceans and Fisheries to inquire about using the DIDSON Diver-Held sonar in the recovery effort for victims of the ferry accident. Jeanne promptly responded to Anna with training materials and additional details, ensuring her that Sound Metrics sonars are US Military approved for search and rescue work and that we would happily be of assistance.

Pictured above: The South Korean Navy aircraft and barge where Bill trained divers at the site of the wreck



Due to the urgency of the situation, Jeanne was asked to open her office on Saturday, May 3 for two representatives of the Republic of Korea to inform them of how the Diver-Held system works and show them actual sonar data in person. Soon after, we were tasked by the Republic of Korea to provide two DIDSON DH (Diver-held) sonars and on-site technical assistance as soon as possible.

As this critical order was made on short notice over the weekend, the Sound Metrics staff volunteered their time and worked tirelessly to prepare units to be ready for shipment Monday morning. "The Sound Metrics team went above and beyond," Richard Morris, Sound Metrics' General Office Manager commented, "No one asked for overtime, they all just told us, 'If you need me, I'll be there.'"



Pictured above: The sites of the pool and classroom training sessions in Mopko.

“The Sound Metrics team went above and beyond. No one asked for overtime, they all just told us, ‘If you need me, I’ll be there.’”

**- Richard Morris,
General Manager**

Thanks to the hard work of the Sound Metrics team, Joe Burch, President, and Bill Hanot, Vice-President, left Seattle Monday morning in order to arrive in Icheon, South Korea on Tuesday May 6. After landing in South Korea, Joe and Bill were met by Daniel, Felix, and Jason from Sound Metrics' local sales contractor, OceanTech, to expedite the transportation of equipment from the airport to the marine university in Mopko, where diver training was to take place. Joe, Bill, and sonars all arrived in Mopko in top condition on Wednesday, May 7. From order to arrival, we were able to come to the assistance of South Korea's search and recovery efforts in only four days!

Joe and Bill immediately began training divers in a series of classroom sessions followed by hands-on pool sessions at the university, with Joe introducing basic imaging fundamentals and Bill teaching the divers how to operate the sonars underwater and navigate the DIDSON software. OceanTech were responsible for arranging for a translator, which was an invaluable asset as the divers spoke little English.

Shortly after pool trainings began on Wednesday, Bill was requested at the wreck area to train divers on site. Bill was flown out to the sunken ferry by a Korean Navy Chinook helicopter, where a huge search and recovery was taking place with over 50 different separate entities present. There he met with the commanding officers to learn the standard procedures for the diving process.

Due to unexpected weather, the transfer of sonar equipment and personnel from the helicopter carrier to one of the two diving barges at the wreck was postponed until Thursday afternoon. Despite the lack of an English translator on the barge, and dive time limited to 20 minutes each, our representative Mir Hakyong Lee from Oceantech and colleague Jin-Yeong Park from KIOST were able to take over the training of new divers and get the DIDSON DH deployed on site.

Bill and Joe returned to the local airport that night and were able to return home to Seattle on Friday. Although the images collected by the local divers at the wreck site were not quite at optimum DIDSON quality due to the limited amount of training most of the divers received, we were honored to be able to be of assistance to the recovery efforts in person and do whatever we could to help the families who suffered such terrible losses gain some closure. In our correspondence with Mir from Oceantech after Bill and Joe's return, Mir related that there was an increased interest in DIDSON technology in the SSU (Ship Salvage Unit) of the South Korean Navy after our departure, as well as improved sonar operation by the officials. In the meantime, we remain ready to come to the personal support of our international partners in South Korea and throughout the world in times of crisis.