DO SHARKS ABIDE BY THE TIDE?
EXAMINING THE FINE-SCALE MOVEMENT OF SHARKS IN RESPONSE TO THEIR ENVIRONMENT
Alexandra McInturf, Term Member of The Explorers Club

Alexandra McInturf’s research lies at the intersection of animal behavior, movement ecology, and conservation in various shark species. This presentation will first feature a local project examining the fine-scale movement of sevengill sharks (Notorhyncus cepedianus) in and out of the San Francisco Bay. Selective tidal stream transport (STST) and passive downstream transport (PDT) are two known mechanisms by which marine organisms reduce energetic costs when moving between habitats. Using a hydrodynamic current simulation model and shark movement data, she explores whether sharks exhibit flexibility in behavioral response to tidal flow, using either STST, PDT, or a combination of the two to move in and out of the San Francisco Bay estuary.

Alex will then provide a brief overview of her dissertation research, that focuses on the fine-scale movement of basking sharks (Cetorhinus maximus) in a known hotspot (i.e. aggregation area) along the northern coast of Ireland. Working in collaboration with Queen’s University, Belfast (QUB), and the Irish Basking Shark Study Group, she will use a variety of telemetry and biologging methods to examine how basking sharks forage and interact within this hotspot, which has been proposed as a marine protected area. Information gathered from this study will be used to generate predictions about the general resilience of temperate hotspots for this species and inform the efficacy of the proposed conservation measures.

Alexandra McInturf is a second-year Ph.D. student in the Animal Behavior Graduate Group at the University of California, Davis and a member of the Wildlife, Fisheries and Conservation Biology department. She is currently a joint graduate student in three different laboratories at UCD (marine ecophysiology, movement ecology, and biotelemetry) as well as a visiting researcher at Queen’s University, Belfast.

Originally from Cincinnati, Ohio, Alex graduated from Williams College in Massachusetts in 2015 with dual degrees in Biology and English. She spent the following year in South Africa with the Oceans Research Program and in Bimini, Bahamas at the Bimini Biological Field Station “Shark Lab”.

Primarily motivated by conservation, her research uses telemetry and biologging to examine the movement ecology and behavior of a variety of elasmobranchs (sharks, rays, and skates), including the basking shark and common skate. In addition, she maintains her own research blog Move.Eat.Repeat., serves as editor of The Ethogram (the official blog of the UCD Animal Behavior Graduate Group) and has published science journalism pieces both online and in print for a wide variety of sources.
Nearshore marine environments are among the most biodiverse regions on the planet yet are at the forefront of anthropogenic change. Jordan will be presenting her diverse approach to understanding threats to nearshore ecosystems and sources of resilience that may allow them to persist and even thrive in an uncertain future. She is a fourth year Ph.D. candidate and NSF Fellow at the UC Davis Bodega Marine Laboratory.

Addressing such a multifaceted issue as threats to nearshore ecosystems requires creative collaborations and a large tool box. She will tell us how growing microscopic kelp forests revealed clues to giant kelp adaption across the western hemisphere, how a DIY remotely operated vehicle may lead to undiscovered ecosystems in unlikely places, and how satellites that circle the globe every 90 minutes are giving power back to tribal nations. She will also touch on how to repair holes in reefs after dynamite fishing, how the delicious Tomales Bay oysters are informing our knowledge of bivalve futures in changing estuaries, and how urchins are changing the Northern California seascape.

Jordan is studying the resistance of nearshore ecosystems to global change. Her Ph.D. thesis work as an NSF Fellow at the Bodega Marine Laboratory (UC Davis) focuses on habitat-forming species, including kelp, coral and oysters, which form the basis of these incredibly diverse nearshore ecosystems. To holistically study nearshore species, her research has taken her around the world: from the penguin-filled kelp forests of Chile to the shark-infested kelp forests of South Africa; from the overfished reefs of the Caribbean to the breathtakingly biodiverse reefs of Australia and Indonesia. Her collaborators include researchers and resource managers from government, academia, and tribal nations.

Jordan’s work is as multifaceted as her interests and relies on amazing collaborators from around the world, including Centro de Investigaciones Biologicas del Noroeste (Mexico), Universidad de Los Lagos (Chile), Hasanuddin University (Indonesia), Hog Island Oyster Company, Mars Inc., and natural resource managers from the Samish Indian Nation, California Department of Fish and Wildlife, and the National Marine Fisheries Service. Her work is supported by grants and fellowships from NSF, CONICYT (Chile), NOAA, National Geographic, and the Explorer’s Club.

Much of the world’s biodiversity can be found where land meets sea, from vast coral reefs to towering kelp forests to lush seagrass meadows. However, these ecosystems are extremely vulnerable to changes in both the terrestrial and marine environments. Using a multifaceted and highly collaborative approach, Jordan Hollarsmith is studying the resistance of nearshore ecosystems to global change.

Upon completing her Ph.D., Jordan plans to pack a laboratory onto a sail boat with her partner, Kyle Neumann (UC Santa Barbara Ph.D. student), and sail to the unstudied and rapidly changing ecosystems around remote islands from the South Pacific to Patagonia where they will partner with local collaborators to conduct ecological and anthropological surveys.
Elora López writes: “Two of the most calamitous phenomena developed in the 20th century were the exponential increase of carbon dioxide (CO2) emissions and the invention and use of nuclear weapons. Those phenomena have had, and continue to have, dramatic effects on the environment. In this talk, I will explore the effects of those phenomena on coral reef ecosystems.”

In Ofu, American Samoa, the backreef lagoon on the south coast of the island experiences highly variable temperature regimes. On one side of the lagoon, the daily seawater temperature fluctuates drastically, while less than a kilometer away, the slightly deeper part of the lagoon experiences a more stable daily temperature. Research on the corals living in this lagoon indicates that the corals that experience very high temperatures more regularly are more thermally tolerant than those that do not. In 2015 and 2017 Ofu experienced bleaching events, which also affected many other reefs across the Pacific Ocean and were deemed “global bleaching” events. Using multi-year monitoring of the corals and their associated algae, microbes, and more, I am studying the best predictors of both bleaching and recovery from bleaching.

In the 1940s and 1950s, the United States Navy conducted 23 nuclear weapons tests on Bikini and 43 on Enewetak, two coral atolls that belong to the Marshall Islands in the Central Pacific Ocean. Sixty years after the end of nuclear testing, Bikini Atoll still has relatively high gamma radiation levels, while Enewetak experiences lower, but still higher than background, levels. People currently live on Enewetak, but the descendants of the original Bikinians refuse to move back to Bikini until the gamma radiation levels are below 15 mrem/year, which is the U.S. Environmental Protection Agency’s standard for human habitation.

No studies have been published publicly on the genetic effects of the radiation on either atoll’s marine or terrestrial wildlife. “By using genomic tools, I aim to produce the first test of whether nuclear radiation persisting in ocean and land sediment affect somatic mutation rates in wild animals.”

Elora López is a 3rd year Ph.D. candidate in Biology at Stanford University, based at the Hopkins Marine Station in Pacific Grove, CA. She uses genomics to address questions about the ecology, evolution, and conservation of marine life. The theme of López’s doctoral dissertation is how and why genetic variation matters for populations living in ecosystems that have been, or are currently being, altered due to human activity. López earned her B.A. in Environmental Biology from Columbia University in 2015. There she studied the genetic connectivity of sea cucumbers across the Fijian archipelago to inform conservation strategies for these overfished marine invertebrates.

Elora is an advocate of science communication, and her first research expedition to Bikini Atoll was featured on the PBS documentary series Big Pacific in June 2017. Her research projects have also been featured in USA Today, The Atlantic, The Guardian, and Hakai Magazine. López is a 2018 National Geographic Early Career Explorer, an Explorers Club Rolex Explorer, and a National Science Foundation (NSF) Graduate Research Fellow.
ON SETTING A WORLD RECORD FOR A FREE-FALL SKYDIVE
NorCa Chapter Member ALAN EUSTACE, FN’15, Meeting April 27, 2018

The Chapter had a chance to meet a true exploration hero up close at our last meeting. Skydiver Alan Eustace provided a gripping description of what it took for him to establish a new skydiving altitude record of 135,899 feet (41,422 meters). Getting up to that altitude took a team of about 50 engineers, pilots, jumpers and space specialists, a high altitude balloon (maximum altitude about 150,000 feet), support aircraft, several low-altitude jumps from an airplane at 18,000 feet and 3 test jumps from the balloon at increasing elevations. Getting down from those elevations and surviving to tell the tale took a specially adapted space age suit and surviving a free fall through the thin air of the upper atmosphere. It also took the support of a remarkably understanding wife and family. More about them later.

Two major issues stay in a listener’s memory: controlling the orientation of the parachute and jumper to keep it from spinning out of control; and dealing not only with the shortage of oxygen at altitude but also with the accumulation of carbon dioxide from the breathing apparatus. Dealing with the spin was an exercise in learning how to fall while wearing the suit. The result was the development of hand and arm movements that give control to the diver.

To deal with the thin atmosphere, the diving suit had to be equipped with the oxygen necessary for breathing. Among other things, it involved dealing with the highly inflammable nature of the O2 to avoid a catastrophic explosion. To handle the CO2 required a separation of breathing in and breathing out systems for the diver. The suit was separated into two compartments such that the oxygen was in the top part of the suit, around the head, and the carbon dioxide was accumulated in the bottom half of the suit.

Other issues included keeping the helmet from fogging up at the high, cold altitudes, deployment of the drogues, and achieving successful balloon launches, as well as recovery of the diver who can be carried away from the launch site a significant distance by the prevailing winds. In the case of the record breaking dive, the landing site was 70 miles away from the launch site.

Two stories about family stand out. In the first story, Eustace told about the 13 reasonable requirements that his wife, Kathy, set out to help him to consider just how risky the venture really was. The 13th and final requirement was that he write a letter to each of their children explaining what he was trying to do and why he wanted to do it.

The second story was about his children, who clearly were in on the venture. He showed one of their favorite videos: a landing from one of the test drops. This video showed the bump and roll of the space suit and occupant as it landed in the desert. It was perhaps the performance of the suit in helping to keep him alive and safe that was particularly satisfying to the children. Or, they may have found it particularly amusing to see their father being rolled in such a dramatic landing. The record shattering jump took place in 2014.

All in all, a most satisfying presentation. Funding for this project came entirely from the Eustace family’s personal resources. Thank you Alan and Kathy. AJ

ANNUAL CHAPTER BUSINESS MEETING

The Chapter Members will be convened at the May 25, 2018 meeting to vote on the recommended slate of Chapter Officers for the coming season, as is required by the by-laws of the chapter. A brief time will be available if anyone wishes to add comments. See additional details on the last page of this newsletter.
IN MEMORIUM
EDWARD VON DER PORTEN FN’80

We have lost one of our most accomplished Explorers. Edward P. Von der Porten (FN’80), maritime historian, teacher, archaeologist, museum director, modelist, and author passed away on April 9, 2018. He will be missed by any who knew him personally, and by the legions that knew of him and learned from him through his prolific career. To say Ed was passionate about his varied interests would be a serious understatement. In some miraculous fashion, he seemed to devote the same unlimited, abiding devotion and interest to each of the many subjects in which he had an interest.

We first met when Ed was the Director of the Treasure Island Museum. I quickly learned that he was a man who combined a deep interest in education and public interpretation, a generosity of spirit, and a definite opinion about how things were to be done. Over the years, we collaborated on a number of archaeological projects and, of all Ed’s traits, I think his generosity was the one most evident. He enthusiastically shared his seemingly unlimited knowledge about all things maritime, from his expertise in 16th century Chinese porcelain, to his understanding of 17th and 18th century ship architecture, to his interest in the 19th century Russian settlement at Colony Ross, among many, many other, quite diverse topics.

A prolific author, Ed published over 90 books, monographs, articles, and reports on a wide range of topics covering maritime history, ship architecture, ship model construction, museology, and Chinese porcelains, among other topics, and graced many of us with his expertise through talks and lectures on the numerous subjects on which he was an expert.

He taught at Santa Rosa High School from 1959 through 1985 and at Santa Rosa Junior College from 1961 to 1982, continuing as guest lecturer until 2004. Ed created the archaeology program at Santa Rosa Junior College in the 1960s and remained director until 1982. One of Ed’s most enduring contributions to education are two of his books, *Write in Style – A Guide to the Short Term Paper,* and *Voyages: A Primary Source Anthology.* Both are still in print and widely used in grammar and high schools.

As president of the Drake Navigators Guild, Ed was instrumental in shepherding the nomination of the Point Reyes National Seashore as a National Historic Landmark, working to commemorate the likely location of Drake’s 1579 visit to the north coast.

Ed’s most recent explorations focused on Chinese porcelain fragments found on a beach in Baja California, Mexico. His annual field expedition to the site led to the discovery of the location of a 16th century Manila galleon, most likely the site of the 1578 wreck of the San Juanillo. True to his nature, each season he unfailingly and thoughtfully invited me along and, because I could never seem to join him, upon his return he never failed to call and give me an update on his latest expedition. Like all who knew him, I will miss Ed as a friend, collaborator, mentor and an Explorer of well-deserved renown.

Fair winds and following seas, my friend.

Jim Allan FN’96

IN MEMORIUM
EUGENE H. BOUDREAU FN’02

On Monday, April 23, Gene Boudreau FN’02 died peacefully at home after a mercifully short battle with pancreatic cancer. He was 83, and a man of many talents. Gene is survived by four children (Raymond, Rod, Roland and Roxanna) and his wife, Sibyl.

I knew Gene for the last quarter of his exciting life. Others can speak to earlier times, his family and building his adobe from the soil, but I knew Gene as an explorer. We are both geologists…my number, licensed in California, is but ten or so earlier than his. He was a Cal man; I am from Stanford. Nevertheless, we got along famously. Early in our careers we were both hard-rock guys: he liked to look for gold and silver. I looked for uranium.

We met as anthropologists, another type of explorer. Again, parallel interests: he in the ancient people of Mexico’s mountains, I in the ancient peoples of the Colorado Plateau. We like these folks and appreciated their lives.

As members of The Explorers Club, our friendship deepened with time. At one meeting when we were swapping stories, he offered to take me back to the Stone Age. It was an offer I accepted. (continued on next page)
FROM THE CHAIR

In April we again had an exciting presentation on high-level exploration as Dr. Alan Eustace FN’15 enthralled us with his exploits above the clouds. Way above. If you’ve climbed Everest at 29,029 ft, try 136,000 ft. with no ropes. The ride up might be smoother but it would be hard to match the thrill of the trip down.

Our meeting sadly included a farewell to one of our long-time members and stalwart Chapter supporters Ed Von der Porten FN’80. Ed’s explorations and accomplishments were many, but to me it was his enthusiasm for his topic and his interest in other’s activities that always brought me a smile. Ed will be dearly missed. He was pre-deceased by his wife Saryl, also a regular attendee at our meetings, and we miss her as well. We also bid farewell to another of our chapter members, Eugene Boudreau FN’02. Gene was a geologist, a writer, an ethnographer and, of course, an explorer of the wild places of northern Mexico. His extensive collection of artisanal products of the area’s indigenous peoples now resides in the Smithsonian. See the articles elsewhere in this newsletter for more information on these two remarkable members.

I’m pleased to report that the development of the Chapter Logo is moving forward. We presented a number of draft ideas at our April meeting and attendees were given the opportunity to express their opinions and preferences. We have narrowed down our selections and are now in the process of preparing some final designs.

I’m also excited to let you know that preparation of our new printed roster is well under way - spearheaded by Member Paul Freitas. Additionally, planning for our annual Chapter Picnic is in progress. Past Chair Rick Saber and his lovely wife Aldeana will be hosting us at their new abode in Novato, assuming Rick can find enough nails to finish his new deck!

Our next meeting will be our final one for this season. How time flies! This will be a special one, comprised of three of our Chapter’s Term Members presenting on their research and academic endeavors as they pursue their Ph.D.s. Term members represent the Chapter’s future and I strongly encourage all of you to attend to express our support for their contributions and continued involvement with the Club.

Lastly, some may remember my presentation at the March meeting of the gender distribution of the current national club: 77% male, 23% female. A member asked me the question – how does our chapter compare? The answer is 72% male, 28% female. The percentages for national members under the age of 30 is 47% male and 53% female. We do not have a complete list of local member’s ages so we cannot presently determine a similar statistic for the Northern California Chapter.

On April 19th, 19 of our members attended a presentation by author and filmmaker Leon McCarron at the CLIF Company headquarters in Emeryville. We want to express our appreciation to the CLIF Company for inviting us and to Leon for a great overview of his adventures. Leon donated an inscribed copy of his latest book to our library. We are also being offered a 30% discount for any member wishing to purchase their own copy. We certainly appreciate it, and hope Leon will be able to arrange to present directly to the Chapter next season.

Stephen E. Smith FN’96

In Memorium, Eugene Boudreau

(continued from previous page)

It was a dozen years ago. We flew to Chihuahua and drove eight hours west into the Sierra Madre for an overnight in Guachochi. Then onward for another eight hours along the mountain spine of tufaceous outcrops. Here we stopped, wandered downslope to a small home and began our collecting. Gene was fluent in Spanish and patient; I watched as he spoke small talk. In time, a storage pot would appear, or a bow and arrow, or a plow. He asked if he might buy each. More words. An offer. A modest negotiation…he respected their needs.

We spent a week in Mexico. At dark these two old geologists would pull off the road, build a fire, heat a can of beans, throw tortillas on the coals, and roll out our sleeping bags; at dawn, refresh the fire to heat water for coffee and more hot tortillas; then ready to gather more artifacts. We visited true stone caves with storage bins and sleeping boards, and watched as a young girl used a mano and metate to grind corn … the way it has been for thousands of years, long before the Spaniards.

We left when we had filled a van with our treasures destined for modern museums. Now we are compañeros. There are other stories, but none beats this one. A treasured memory of a true gentleman.

Lee Langan MED’99*

*designates an Explorers Club Member as a “Medalist”

PAID DUES
HONOR ROLL

MEMBERS
Alexander, James
Alexander, Linda
Altman, James
Amanar, Julia
Beer, Michael
Bekins, Joan
Blake, Rick
Boett, Kendra
Booth, Joan
Chase, H. Keith
Cheeseman, Ted
Cook, Sandra
Cooper, Alan
Day, Peggy
Delfino, Rick
Diggles, Mike
Dolan, Dow
Dolan, Tom
Dublin, Thom
Dvorak, Don
Dvorak, Elaine
Dyic, Palmer
Estep, Sue
Estwing, Jack
Ford, Art
Fox, Susan
Freitas, Anna
Freitas, Paul
Gubler, David
Griffith, Jerry
Hemmings, Peter
Heydorn, William
Heyseman, Donald
Hicks, Harry
Higgins, Robert
Himmon, Jim
Himmon, Von
Hutchison, Alan
Intrawood, William
Jiure, Kristi
Jensen, Anders
Klein, Ronald
Klez, Suzanne
Koenenfeld, Keith
Langan, Lee
Lapham, Eilen
Lelkes, Alison
Lidicker, William Jr.
Ling, Herb
Macbeth, Pierre de St. J.
Macon, William
McMillan, Peter H.
Mimelleti, Marco
Miiller, Gregory
Nichols, Alan
Proctor, James
Rygh, Rebecca L.
Saber, Rick
Schneider, Robert
Skade, William
Smith, Steve
Stroka, Bill
Tartar, Jill
von der Porten, Ed
Wagner, Hugo
Wel, James
White, Dede
Wren, Sherry
SIRDARS
Barnes, James
Booth, Barry
Cohn, Lawrence
Cooper, William Scott Jr.
Crowder, Wendy
Darigheho, Jovy
Elkus, Nancy
Engstrom, Dale
Heyseman, Louise
Hirzel, David
Hutchison, Ann
Isaac, Nancy
Jensen, Kathy
Judd, Kathy
Kidd, Joe
Langan, Karine
Loew, Tim
Longo-Cohn, Mary
McLaughlin, Liz
Nikas, A. James III
O’Keefe, Bonny
Patterson, Tom
Pfeifer, Laura
Saber, Aldeana
Stewart, Zach
Straka, Barbara
Van Auvinen, Bob
Van Ausen, Judy
Weiman, Mark

from the chair
ANNUAL CHAPTER BUSINESS MEETING: 25 MAY 2018

The business of this meeting will be to present the slate of and vote on candidates for the Officers and Member-Elected Directors of the Chapter for the coming 1-year terms. All members of The Explorers Club may vote.

The nomination committee has presented the following slate of officers nominated for consideration by the membership:

Chair: Stephen Smith (continuing)
Vice Chair: Lesley Ewing (continuing)
Secretary: Yvonne Hurson (continuing)
Treasurer: Joan Boothe (continuing)

The following Directors were elected to a 3-year term last year:
Member Elected Director 1: Jim Hurson
Member Elected Director 2: Sandra Cook
Member Elected Director 3: Paul Freitas

No new Directors have been recommended by the nominating committee and no vote is needed for this slate to be accepted. Nominations from the Membership should be emailed to Secretary Von Hurson, Secretary of the Chapter at (trekking@sonic.net) no later than 7:00 pm May 22, 2017. After May 22 and before the meeting, nominations should be left by voicemail at 707-545-6880.

WANT TO GET INVOLVED IN THE INNER WORKINGS OF THE CHAPTER?

There are lots of tasks that come up during the course of a year: speakers, meetings, field trips, membership, newsletter, etc. A good place to get started is by volunteering to serve on a committee. Talk to any of the Chapter Officers or Directors for more information.

Leon McCarron, who spoke to a meeting in Emeryville at which 19 members of this Chapter attended, has offered to sell his book, The Land Beyond at a 30% discount to Chapter Members. If interested in purchasing a copy of this remarkable book at discount, email Steve Smith at ecnca@oceanearth.org

CHAPTER MEETING

Friday, May 25, 2018

Place: The Dolan Law Firm
1438 Market Street
San Francisco, CA 94102

Time: 6:30 - reception
7:15 - dinner; 8:00 - program

Meal Options: Stuffed Pork Tenderloin or Grilled Salmon Fillet

Veggie option - pasta primavera

Cost: $49 in advance, $60 after 22 May; Students: $35.
(2018 dues: Members $25, Sirdars $50)

Please mail reservations, checks & dues to Joan Boothe
2435 Divisadero Street, San Francisco, CA 94115.
Or email Joan [hoodooskr@aol.com]
or call Joan at 415-233-1697

You can sign up and remit your meal costs (and dues) online.
Go to the chapter website and use the convenient payment buttons there.

There is a PAYPAL BUTTON on our website (www.explorersnorca.org), easy to use!