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# CCPO CIRCULATION

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## THE SCHOLARLY LEGACY OF CCPO

By **John M. Klinck, CCPO Director**

The Center for Coastal Physical Oceanography (CCPO) was formed with support from the Commonwealth of Virginia about three decades ago. In that span of time, there have been a number of people associated with CCPO as faculty, research scientists, post-docs and graduate students. These people are the core resource and legacy of CCPO. They have generated funding from various sources that brought money to Old Dominion University, supported research projects, and lead to papers that provided visibility for ODU, the Department, and CCPO. Most have gone on to successful careers at other institutions.

Most past newsletter articles have focused on current or recent activity by people at CCPO. In this way, we were able to keep everyone informed about exciting, ongoing activities. We changed the focus in this newsletter issue to look at success stories of some who passed through CCPO on the way to careers elsewhere. Many who were at CCPO have gone on to academic careers; others have taken skills learned at CCPO and applied them at consulting firms and other commercial entities.

Several past graduate students who earned Ph.D. degrees have gone on to develop their own research programs and establish academic careers. In the current newsletter, we hear of the success by Ajoy Kumar, Baris Salihoglu, Bettina Fach, Margaret McManus, and Yvette Spitz. Previous newsletters presented paths followed by Marjy Friedrichs and John Holdzkom. We hope to continue making these success stories a part of the newsletter. I want to recognize the accomplishment of Baris as the director of the Institute of Marine Science at the Middle East Technical University, and also of Margaret and Bettina as heads of their respective departments, considerable accomplishments in the male-dominated world of academia.

It is important to recognize the contribution of Eileen Hofmann as advisor to Baris, Bettina, Margaret, and Marjy, among other students at CCPO, and as a contributor to the academic visibility and success of CCPO.

While the focus here is on folks from CCPO who left a number of years ago, we also recognize current students and recent graduates who are on the path to similar accomplishments. These student and alumni profiles are found in past newsletters and will continue in future issues.

Finally, we wish to recognize the recent arrival of Dr. Sönke Dangendorf as a new member of the OEAS Department and contributor to CCPO. His research interests are in global sea level, among other topics. We will provide more details of his background and interests in the next issue of *CCPO Circulation*.



**OLD DOMINION**  
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## Eminent Scholar designation for Eileen Hofmann

We are pleased to announce that Dr. Eileen Hofmann has been designated an Eminent Scholar by Old Dominion University. This is a perpetual designation by the University to recognize faculty members of unusual merit and service to the University. It is awarded only to Full Professors with a clearly established national reputation in the scholar's discipline and who have shown substantial success in obtaining external funding for research.

Eileen is an integral part of the success of CCPO through her work with graduate students and post-docs, as documented in recent newsletters. She also has a national and international presence as a contributor to several



leadership committees for the American Geophysical Union (AGU) and as past Secretary and past President of the Ocean Sciences section of AGU. She has been a member and chair of several international science committees, including Southern Ocean GLOBEC, IMBeR, and Southern Ocean Observing System, and continues to

guide international oceanography programs through participation in planning and advisory committees.

CCPO salutes Eileen in this well-deserved recognition of her scholarly stature by Old Dominion University.

## CCPO Alumni Spotlight

# BETTINA FACH, PH.D., '03



L-R: Baris and Bettina with their children

After finishing an environmental engineering degree in Germany, I started my Ph.D. at CCPO in 1996 with Eileen Hofmann as my advisor. My time at CCPO was a truly wonderful experience, including lots of opportunities for students, seminars, and cruise opportunities that

(as I learned only later on) are not to be taken for granted. My Ph.D. work focused on investigating the connectivity of Antarctic krill at the Antarctic Peninsula with South Georgia and I was fortunate that Eileen organized for me to join a krill acoustic Antarctic survey on the RRS *James Clarke Ross*. The cruise was led by the British Antarctic Survey and gave me the chance to take a closer look at the subject of my modeling work. My Ph.D. thesis defense took place 17 years ago in winter 2003 and after that I moved on to a 1.5-year post doc position at WHOI, working on modeling the ecosystem dynamics at Bermuda Time Station (BATS). Though I enjoyed my time there, I eventually wanted to return home and did so in late 2004. I moved back to Germany, this time working at the Alfred-Wegener Institute for Polar and Marine Research with my own project funding. I returned to modeling aspects of the krill life cycle and thoroughly enjoyed being back home and continuing Antarctic cruises, only this time on the

German research vessel, R/V *Polarstern*.

After getting married to Baris Salihoglu, former fellow graduate student at CCPO, we moved to Mersin, Turkey in 2007 where luckily, we were both offered tenure track positions at the Institute of Marine Sciences (IMS). The institute is part of the Middle East Technical University, Turkey's largest English-speaking University. The move did not only entail new social challenges with learning a new language for me, but also professional challenges as my research focus shifted towards the Black Sea and efforts to understand different aspects of recent regime shifts there via modeling. Over time, we had three kids: the two boys, Leon and Deniz, and later our little girl, Ada. Seeing the family grow slowly was wonderful but also posed tremendous challenges in the way of combining work and family - and continues to do so. It's kind of like running a large logistics company on the side while trying to do science, but it is also great fun.

As a faculty member at IMS, I started teaching and advising my own students and found it very rewarding but also rather challenging. I still marvel about the patience Eileen used to have with us students at the time and have tried to follow her example as best I can. Over the years, I have graduated four Ph.D. students and several M.Sc. students and now have a small research group, including one post-doc and Ph.D. students, while looking to hire more students on newly funded projects. Somewhere along the way, about five years ago, I was awarded tenure and have just recently been appointed the Head of the Oceanography Department. In recent years, Turkey has worked towards establishing its own Antarctic Science program and I have been involved in this during the first years in an advisory role. Now that the program has taken off, it has given me the chance to secure funding to return to my roots once again and work on modeling krill connectivity in the Southern Ocean, among other things.



## CCPO Alumni Spotlight

# BARIS SALIHOGLU, PH.D., '05

After receiving my Ph.D. from Old Dominion University in 2005, I moved to France for a two-year postdoc period at CNRS in Toulouse and afterwards returned to my childhood home in southern Turkey as a young researcher at the Institute of Marine Sciences (IMS) of the Middle East Technical University (METU) in 2007. For the past four years, I am honored to be the director of this Institute.

My main motivation to start my Ph.D. at CCPO was to work with Eileen Hofmann, who was already internationally well known as a brilliant marine ecosystem modeler. Among many good memories that I value from that time are of course our trips to Antarctica together with Eileen, which were the highlights of my Ph.D. period. My Ph.D. at ODU was not only a time where I developed as a researcher but also were precious times where I have established strong friendships and met my future wife, Bettina Fach, who was also Eileen's student. It was hard to leave Norfolk as it was my second home after almost six years.

I would like to mention a little bit about my current university, METU, which is Turkey's leading university in the fields of natural and engineering science. As an English-taught, internationally known research-intensive university, METU participates in and manages many international projects. Notably, the Institute of Marine Sciences boasts the highest number of EU and national project participations and/or coordinations in the university, despite being the smallest of the three METU campuses. IMS is located on the Mediterranean coast of Turkey on a wonderful campus, including a small harbour and

beaches where Loggerhead and Green turtles come to nest each year.

I am a recently appointed Full Professor in the Department of Oceanography, where I am especially passionate about continuing its robust scientific achievements as well as protecting the large campus' environmental integrity. My current research interests cover a range of multidisciplinary research

topics in diverse geographical regions, including the North Atlantic, Black Sea, and the Mediterranean Sea. After returning to Turkey, I formed the Marine Ecosystem Modelling Group, which at the time consisted of 20 researchers (seven faculty and postdoctoral members, seven Ph.D. students, and six M.Sc. students). Currently, my work has shifted more to administrative issues.

Apart from being the Institute director, I also lead the DEKOSIM project for establishing a new centre of excellence (Centre for Marine Ecosystem and Climate Research) funded by the Turkish Ministry of Development. This CoE strives to be the national, as well as regional (Southwest Europe), leader in marine ecosystem observation and forecasting. Recently, I had a leading role in establishing the second centre of the institute, a blue growth centre, that will focus on promoting the sustainable growth of marine sectors at the national scale.

On a personal note, Bettina and I are parents of three young children and we very much enjoy our time at the institute campus.



Aerial view of the Institute of Marine Sciences (IMS) of the Middle East Technical University (METU), located on the Mediterranean coast of Turkey

## CCPO Alumni Spotlight

# MARGARET ANNE MCMANUS, PH.D. '96



In 1996, I graduated from CCPO with a Ph.D. in Oceanography. I was most fortunate to have worked with talented faculty who, in addition to imparting scientific expertise, inspired me to create a vision for myself in the field of oceanography. The exemplary faculty from CCPO helped me to create a

direction and plan an academic and professional journey that has proven to be both exciting and an ongoing adventure.

Following graduate school, I continued my research experience as a post-doctoral researcher at the Graduate School of Oceanography at the University of Rhode Island (GSO URI). During that period, my research focused on thin layers of plankton in the coastal ocean. This experience was so positive and productive that I was invited to continue my research as an Assistant Marine Research Scientist at GSO URI. I had the extraordinary opportunity to be the PI on several grants from ONR and the National Ocean Partnership Program during this time, which launched my career.

In 2000, I received my first offer for an Assistant Professor position at the University of California, Santa Cruz in the Ocean Sciences Department. I packed my belongings and headed west. I found the mountains and redwoods of Santa Cruz to be beautiful and awe-inspiring. And, most importantly, the vast Pacific Ocean was right outside my window, offering unlimited accessibility. At UC Santa Cruz, my research focused on coupling biological and physical processes in the coastal ocean. I enjoyed teaching a variety of courses: physical oceanography, coupled biological-physical oceanography, introduction to oceanography and teaching methods in oceanography. I also had a career-changing opportunity to become a principal investigator in the Partnership for Interdisciplinary Studies of Coastal Oceans (PISCO). PISCO is an academic consortium that conducts research to advance the understanding of the coastal ocean within the California Current Large Marine Ecosystem and

inform management and policy. I had the privilege of working with this group as a PI from 2000 to 2014.

After three years in California, I continued moving west to the tropical paradise of Honolulu, Hawai'i, where I was invited to serve as Assistant Professor in the Department of Oceanography at the University of Hawaii at Mānoa's (UHM) School of Ocean and Earth Science and Technology (SOEST). Here, I was able to expand my research program to include several postdoctoral researchers, graduate students, undergraduate students and oceanographic technicians. I established the Coastal Physical Oceanography and Marine Ecosystems research group (CPhOaME; <https://www.margaretmcmamus.com/>).

It has been a privilege to contribute to the successful careers of so many enthusiastic and bright early career scientists and to work alongside so many talented oceanographers. The pride I have gained from mentoring and advising is immeasurable. My time in the department has been filled with both challenges and successes. I have the honor of being the first woman to receive tenure in the Department of Oceanography. My academic responsibilities have included teaching several innovative classes, such as coupled biological-physical oceanography and communication of research results, among others. Over the 17 years that I have been in the department, my research responsibilities have included running 36 multi-year, collaborative grants from a wide variety of federal, state, non-profit and private funding sources.

In January 2020, I was named Chair of the Department of Oceanography. It is an honor to be nominated and elected for this important role, as I am the first woman in the 56-year history of the department to hold this position. While the current COVID-19 outbreak has required us to adapt to new working conditions and constraints, I could not be prouder of the faculty, staff, post-doctoral researchers and students who are working tirelessly to continue moving the science forward while also curbing the spread of this devastating disease. I look forward to continuing to serve and work collaboratively with members of the department, school, university, and community in the years ahead.

My career thus far has been a journey that I am proud to have fashioned and from which I have derived enormous satisfaction. I am truly grateful to all those who have supported, critiqued, challenged, and embraced me throughout this adventure. Best wishes to all who are forging your own paths through the field of oceanography. Mahalo nui loa!



## CCPO Alumni Spotlight

# AJOY KUMAR, PH.D. '96

I came to CCPO in January of 1991 from India to do my Ph.D., thanks to a graduate student fellowship from Professor Gabe Csanady. My first memory of CCPO was the old oceanography building behind the ODU bookstore, and I also remember our move to the new facility at Crittenton Hall in the summer of 1991. I was one of the large incoming group of graduate students who called CCPO home and together we developed a healthy learning environment. Although Gabe was my official advisor, Larry Atkinson involved me on many of his research projects and proposals and had a strong positive influence on my career that lasts to this day. John Klinck and Eileen Hofmann taught most of the oceanography courses and I use some of what I learned from them to teach my students today. I worked on shelf-slope exchange processes in the Mid-Atlantic Bight using both satellite and in-situ data and graduated as Gabe's last student in 1996.



Ajoy demonstrates an experiment in fluid flows to his students, using a rotating tank.

Soon after graduation, my wife, Vrinda, and I moved to Miami, where I joined the Rosenstiel School of Marine and Atmospheric Sciences (RSMAS), University of Miami as a post-doctoral scholar. I worked in the remote sensing laboratory, developing algorithms for retrieval of various oceanic parameters from satellites. As part of algorithm development, I participated in several cruises to validate the satellite retrievals. These cruises allowed me to travel to many places around the world, meet many international scientists, and start some fruitful research collaborations. After my daughter, Rhea, was born, I reduced my voyages and started exploring various statistical tools for analyzing large data sets with the aim of improving the accuracy of satellite retrievals of oceanic parameters. I continued my

work at RSMAS as a Research Scientist until 2007, when I was offered a faculty position at Millersville University in Pennsylvania.



Ajoy (in hat and sunglasses) preps equipment with his students before a field excursion.

At Millersville University (MU), I found a new passion for teaching and advising students. My experience at RSMAS allowed me to develop and implement new oceanographic courses and curriculum at MU. I was instrumental in the redesign of our Chincoteague Bay field station, where we offer several “hands-on, feet wet” marine science courses along with other faculty from the PA State System universities. I developed a skill for mentoring and advising undergraduate and graduate research that has contributed to successful careers for many students in this field. I also pursued research collaborations with NASA on LiDAR data acquisition and processing and climate change research, including sea level rise issues along the Delmarva coast. My work at Millersville has gradually evolved to graduate courses in geo-informatics, with much of my teaching and research now focused on sonar and drone mapping. But teaching and advising undergraduate students and watching them develop to their full potential will always remain the most satisfying reward of my career. It has been a long and rewarding 30 years since I left CCPO, but I am happy to give back to my students what I learned at CCPO.

## CCPO Alumni Spotlight

# YVETTE H. SPITZ, PH.D., '95



Yvette on her way to sampling the Jago Lagoon near Kaktovik, AK on the North Slope.

A quarter of a century since graduation! Hard to believe but it still feels like yesterday with so many great memories from CCPO.

After a degree first in Physics, then in Oceanography and in Education, from Liège University (Belgium) and a detour by Florida State University (FSU) earning a M.S. degree, I started the Ph.D. program at CCPO with Prof. John Klinck. Since I had experience in modeling from my work in Belgium and in data assimilation from my study at FSU, I had the perfect training to undertake a project with John in data assimilation of tide gauge data in the Chesapeake Bay to estimate bottom drag and improve modeled circulation in the Bay. I was the first CCPO fellow as the Center opened in 1991; I barely arrived in time for the opening celebration. Professors John Klinck, Eileen Hofmann, and Larry Atkinson welcomed me after an abrupt move from FSU. But what led to my actual research was a project that I did in parallel to my dissertation research in collaboration with Eileen and a visiting mathematics professor from East Tennessee State University (ETSU), Linda Lawson. While data assimilation had become a hot topic in atmospheric science and physical oceanography, Eileen, Linda, and I were one of the first groups, if not the first, to tackle data assimilation in ecosystem modeling and parameter estimation. CCPO student, Marjy Friedrichs, took over the project when

I graduated and it became her Ph.D. project, and Linda returned to ETSU.

In 1995, I moved to Oregon State University (OSU) as a postdoctoral fellow in biological oceanography under Prof. Mark Abbott's supervision. It was at that time that I acquired the necessary knowledge in the field of biological oceanography. While the transition from physicist to biological oceanographer has offered some challenges, I feel fortunate to have had the opportunity to approach the field of oceanography from different angles. After my post-doc, I continued on the research faculty track in physical and biological oceanography at OSU. However, my interest in teaching never died and after reaching the rank of associate research professor, I transitioned to the teaching tenure track. I am now a tenured full professor in the College of Ocean, Earth, and Atmospheric Sciences (CEOAS) at Oregon State University in ocean biogeochemistry and ecology. Yes, the names of the college and various departments have changed over the years. I mainly teach two courses: physical/biological interactions at the graduate level and biological oceanography at the undergraduate level. Research remains a large part of my activities, both due to my interests and to support salary for me and my students and post-docs.

In the last 25 years, my research has focused on the development of coupled circulation/ecosystem models that can be applied to the world ocean, from microbes to ice algae and from coastal to basin scale circulation. My regions of interest included the eastern boundary upwelling region off Oregon, the Columbia River Estuary, the North Pacific basin, the Arctic Ocean (including lagoons), the North Sea, and the Patagonia Shelf region. With my students and post-docs, I also covered regions of the Mediterranean, Western Caribbean, the Kenyan-Tanzanian Shelf, and the Chilean coastal region. I continue developing and applying new data assimilation techniques, such as particle filters with my post-doc and colleagues from OSU and Berkeley. I have been and am still part of large national programs such as NSF-funded GLOBEC, JGOFS, STC-CMOP, LTER-BLE and NASA-funded ICESCAPE. I hope to continue these and similar projects for many more years.

The CCPO family has occupied a very special place in my heart since the first day I arrived in Norfolk. It is always a treat to see members at various meetings, as our busy life often does not allow us to visit otherwise.

# JUST THE FACTS

## Appointments

**Larry Atkinson** was Chair of the NSF Ocean Observatories Initiative Facilities Board until November 2019, when he became a Past Chair.

## Presentations

Barthel, A., C. Veneziani, **M.S. Dinniman**, and C. Kittel. Sensitivity of Antarctic Basal Melt Rates to Precipitation. AGU Ocean Sciences Meeting 2020, San Diego, CA, February 17-21, 2020.

Bouchard, C., M.K. Cambazoglu, **M.S. Dinniman**, P.J. Fitzpatrick, **E.E. Hofmann**, and J.D. Wiggert. Influence of Diurnal Sea Breeze on Residence Time and Associated Biogeochemical Processes in the Mississippi Sound and Bight. AGU Ocean Sciences Meeting 2020, San Diego, CA, February 17-21, 2020.

Cambazoglu, M.K., J.D. Wiggert, **M.S. Dinniman**, and B.N. Armstrong. Spatio-temporal variability of cross-shelf transport in Mississippi Bight. AGU Ocean Sciences Meeting 2020, San Diego, CA, February 17-21, 2020.

**Dinniman, M.S., P. St-Laurent**, K.R. Arrigo, **E.E. Hofmann**, and G. van Dijken. Direct and indirect Contributions of Ice Shelves to Micronutrient Supply to the Surface Waters around Antarctica. AGU Ocean Sciences Meeting 2020, San Diego, CA, February 17-21, 2020.

**Ezer, T.**, On the changing pattern of seasonal flooding along the US East Coast, CP52A-04. AGU Ocean Sciences Meeting 2020, San Diego, CA, February 17-21, 2020.

**Ezer, T.**, The short- and long-term impacts of hurricanes on coastal flooding along the U.S. East coast, HurriCon: Science at the Intersection of Hurricanes and the Populated Coast. East Carolina University, Greenville, NC, February 27, 2020.

**Hofmann, E.E.**, Environmental Controls on Withering Syndrome in Abalone: A Modeling Study. AGU Ocean Sciences Meeting 2020, San Diego, CA, February 17-21, 2020.

**Hofmann, E.E.**, Linkage of the Physical Environments in the Western Antarctic Peninsula Region to the Southern Annular Mode and Implications for Marine Ecosystem Production. AGU Ocean Sciences Meeting 2020, San Diego, CA, February 17-21, 2020.

Hudson, K., M.J. Oliver, J.T. Kohut, **J.M. Klinck**, and **M.S. Dinniman**. Diel Vertical Migration of Krill in a Subsurface Eddy may Promote Retention within Palmer Deep Canyon. AGU Ocean Sciences Meeting 2020, San Diego, CA, February 17-21, 2020.

Moffat, C.F., **M.S. Dinniman**, X. Wang, B. Aguiar-Gonzalez, **J.M. Klinck**, and D. Sutherland. The heat budget of the west Antarctic Peninsula Continental Shelf. AGU Ocean Sciences Meeting 2020, San Diego, CA, February 17-21, 2020.

Park, K., E. Ci Lorenzo, K. M. Cobb, R. J. Clarck, I. Federico, N. Pinardi, G. Coppini, N. Deffley, R. Mathews, C. G. Piecuch, and **T. Ezer**. Drivers of coastal flooding along South-Atlantic Bight during Hurricanes Dorian and Matthew, CP53D-06. AGU Ocean Sciences Meeting 2020, San Diego, CA, February 17-21, 2020.

**Plag, H.-P.**, Modern Climate Change: A Result and Determinant of Global Order. Invited presentation to the Global Affairs Committee of Greater Hampton Roads. Virginia Beach, VA, January 11, 2020.

Sedwick, P., S.F. Ackley, **M.S. Dinniman**, B. Loose, B.M. Sohst, and S.E. Stammerjohn. Unravelling the Seasonal Cycle of Dissolved Iron on the Antarctic Continental Margins: Fall-Winter Observations from the Ross Sea Polynyas. AGU Ocean Sciences Meeting 2020, San Diego, CA, February 17-21, 2020.

Springer, S., **M.S. Dinniman**, and L. Padman. Interaction Between Antarctic Circumpolar Current Eddies and the Sea Ice Edge: Influence on Sea Ice Extent. AGU Ocean Sciences Meeting 2020, San Diego, CA, February 17-21, 2020.

Sutherland, D., K.L. Riverman, **M.S. Dinniman**, C.F. Moffat, B. Aguiar-Gonzalez, R. Obermeyer, and **J.M. Klinck**. Updating our understanding of oceanic controls on glacier terminus retreat along the west Antarctic Peninsula. AGU Ocean Sciences Meeting 2020, San Diego, CA, February 17-21, 2020.

Wang, X., C.F. Moffat, B. Aguiar-Gonzalez, **M.S. Dinniman, J.M. Klinck**, and D. Sutherland. Variability and dynamics of along-shelf exchange in the west Antarctic Peninsula (wAP). AGU Ocean Sciences Meeting 2020, San Diego, CA, February 17-21, 2020.

Wiggert, J.D., C. Bouchard, **M.S. Dinniman**, M.K. Cambazoglu, P.J. Fitzpatrick, B.N. Armstrong, and **E.E. Hofmann**. Influence of River Inputs and Diurnal Sea Breeze on the Tidal Inlet Exchanges that control the Marine Ecosystem and Biogeochemical Processes of the Mississippi Sound and Bight. AGU Ocean Sciences Meeting 2020, San Diego, CA, February 17-21, 2020.

Yager, P.L., H. Oliver, **P. St-Laurent**, R.M. Sherrell, and S.E. Stammerjohn. High-resolution ocean model illustrates how ice-ocean interactions impact the CO<sub>2</sub> uptake of an Antarctic coastal polynya. AGU Ocean Sciences Meeting 2020, San Diego, CA, February 17-21, 2020.

Zhang, Z., **E.E. Hofmann, M.S. Dinniman**, C. Reiss, W.O. Smith, Jr., and M. Zhou. Linkage of the Physical Environments in the Northern Antarctic Peninsula Region to the Southern Annular Mode and the Implications for Marine Ecosystem Production. AGU Ocean Sciences Meeting 2020, San Diego, CA, February 17-21, 2020.

## Publications

Ben-Horin, T., J. Maynard, **E. Hofmann**, E. Powell, B. Bolker, and H. McCallum. 2020. Modeling and forecasting disease dynamics in the sea. In: *Marine Disease Ecology*, D.C. Behringer, B.R. Silliman, K.D. Lafferty (eds.), Oxford University Press, 233-255.

Gehrels, W.R., **S. Dangendorf**, N.L.M. Barlow, M.H. Saheer, A.J. Long, P.L. Woodworth, C.G. Piecuch, and K. Berk. 2020. A Preindustrial Sea-Level Rise Hotspot Along the Atlantic Coast of North America, *Geophysical Research Letters*, 47(4), <https://doi.org/10.1029/2019GL085814>.

Gwyther, D.E., K. Kusahara, X.S. Asay-Davis, **M.S. Dinniman**, and B.K. Galton-Fenzi. 2020. Vertical processes and resolution impact ice shelf basal melting: A multi-model study, *Ocean Modelling*, 147, 101569, doi:10.1016/j.ocemod.2020.101569.

Hückstädt, L.A., A. Piñones, D.M. Palacios, B.I. McDonald, **M.S. Dinniman, E.E. Hofmann**, J.M. Burns, D.E. Crocker, and D.P. Costa. 2020. Projected shifts in the foraging habitat of crabeater seals along the Antarctic Peninsula, *Nature Climate Change*, doi:10.1038/s41558-020-0745-9.

Parra, S.M., V. Sanial, A.D. Boyette, M.K. Cambazoglu, I.M. Soto, A.T. Greer, L.M. Chiaverano, A. Hoover, and **M.S. Dinniman**. 2020. Bonnet Carre Spillway freshwater transport and corresponding biochemical properties in the Mississippi Bight, *Continental Shelf Research*, 199, 104114, doi:10.1016/j.csr.2020.104114.





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