By Sönke Dangendorf

By the end of 2021, my wife, Lengxi, and I moved to New Orleans, starting a new chapter at Tulane University. Leaving the office at 4111 Monarch Way was not an easy step. Over the past two years, the CCPO family has become a home to us in which we found caring colleagues, mentors, and friends. Particularly important to me has been John Klinck, whose mentorship has gone far beyond scientific discussions and has shaped my personal and professional development significantly.

As some of you might remember, my educational background lies in civil and coastal engineering, and it was only during my Diploma and Doctoral theses that I slowly started drifting into the field of oceanography. My first research position was at the Research Institute for Water and Environment (fwu) at the University of Siegen, Germany. The institute has a long-existing expertise in coastal engineering with a particular emphasis on designing water levels for coastal structures, primarily for dikes that protect the German North Sea coastline against surging seas. I remember the early discussions with my supervisor, Jürgen Jensen, and colleagues, Thomas Wahl and Christoph Mudersbach, who emphasized the need of a better common understanding of the sea-level variations for coastal design purposes. This actually awakened my motivation to dive deeper into the causes of sea-level variability and change. I quickly realized that my educational focus on hydraulic engineering was only suitable to a limited extent and that much more knowledge about the open ocean was required to understand the variations that we observe at the coast. Therefore, I started poring over the typical oceanographic books: *Atmosphere-Ocean Dynamics* by Adrian Gill, and Richard Thompson and William Emery’s *Data Analysis Methods in Physical Oceanography*; however, after a while I realized that my independent oceanographic endeavors at that time were not enough.

With our move to Norfolk in December 2019, I got the chance to gain first-hand experience in a well-established oceanography department. My daily discussions with CCPO colleagues over the past two years have indeed provided me the opportunity to sharpen my view of the coast and...
Letter from the Director

University, I am joining the newly founded Department of Dikes, or levees as they are called here in the US. At Tulane With our move to New Orleans, we are returning behind the pluvial boundaries to find common solutions. The problem and emphasizes the need of working across disciplines to work. This illustrates the interdisciplinary nature of the impacts of rising seas already affect almost all aspects of sciences that come along with tidal flooding. Here in Norfolk, the major flooding hotspots of Norfolk (Llewellyn Avenue and Hampton Boulevard) has made us aware of daily challenges that come along with tidal flooding. Here in Norfolk, the impacts of rising seas already affect almost all aspects of people’s lives that go far beyond obstructing their commute to work. This illustrates the interdisciplinary nature of the problem and emphasizes the need of working across disciplinary boundaries to find common solutions.

With our move to New Orleans, we are returning behind the dikes, or levees as they are called here in the US. At Tulane University, I am joining the newly founded Department of River-Coastal Science and Engineering. The department is envisioned to be a unique educational enterprise that will focus on the world’s river, deltaic, and coastal systems, using the combined science and engineering approach pioneered by the School of Science and Engineering. By fusing civil, environmental, and coastal ocean engineering disciplines with elements of the geosciences and ecological sciences, the goal is to educate a new generation and novel breed of scientists, engineers, planners, and decision-makers that can address the complex, interdisciplinary problems in river-coastal systems associated with changing climate, sea-level rise, and the human overprints on the natural landscape. I am grateful for the opportunity to join a department that managed overcoming the usual departmental and faculty boundaries that hamper interdisciplinarity, particularly in teaching. It also allows me to combine the engineering and oceanography skills that I gained at my former institutions in Siegen and Norfolk. As of now, we are five colleagues, and we just submitted our new graduate program which will hopefully be approved by the end of 2022.

While being excited about this new adventure in New Orleans, we are leaving CCPO with very heavy hearts. CCPO has become a family for us, and we are grateful for the unconditional support everyone provided us over the last two years. In this regard, I would like to say special thanks to Julie Morgan, Mike Dinniman, and the other CCPO and OES colleagues, who welcomed us with open arms from the very beginning and helped us a lot with the daily challenges that emerge when settling in a new country. Despite our relocation to Louisiana, the CCPO spirit will certainly always accompany us.

See you later, alligator!

Oceanography, and environmental science in general, spans a wide variety of disciplines, which is intellectually engaging to some scientists. Much of the research and teaching in an oceanography department requires understanding of processes outside of our narrow specialties. A perplexing question for me is why coastal engineering and physical oceanography are in separate departments (and colleges).

The oddity of this separation was made clear recently with the arrival of Sönke Dangendorf at ODU with his background in engineering. He found many common interests with students and faculty at CCPO. In many ways, he already spans the gulf between these two academic specialties. I find it interesting that his new position at Tulane University is in a newly developing department that combines ocean and engineering topics. It seems to me that this is an important example of a possible new collaboration for other oceanography, environmental science, and engineering departments to consider.

There is an added benefit to this collaboration in that engineers are trained to engage the general public in their pursuit of building structures of various sorts. A traditional oceanographic department could benefit from this engineering expertise to reach a public that may be interested in rising sea level, marine heat waves, and other ocean processes that have a direct impact on society and its decisions. The future is out there. We need to see the possibilities and take advantage of them.

— Dr. John Klinck, Director of CCPO & Professor of Oceanography
At the end of May 2021, I flew with the International Ice Patrol (IIP) on an Ice Reconnaissance Detachment (IRD) out of St. John’s, Newfoundland to conduct reconnaissance patrols of the North Atlantic. IIP designates a daily “iceberg limit,” depicting the location of icebergs that may imminently impact the transatlantic shipping lanes. The IIP was established as a direct result of the tragic sinking of the RMS Titanic in 1912. These patrols fly every two weeks during the ice season, which occurs from February to July. Reconnaissance flights are flown in the Coast Guard’s HC-130J (Hercules) aircraft and fly between 5–9 hours each day, when the weather allows. Patrols cover the eastern, southern, and western iceberg limits along the 1,000 m depth contour and up to 55ºN in search of icebergs, covering an expanse of water about 30,000 square miles. The location, size, and type of iceberg are logged by ice observers (people observing them visually out of the windows of the aircraft), as well as by radar and aircrew who operate FLIR cameras. This data is added to a computer model at the IIP Operations Center that tracks the position, drift, and melt of the icebergs with given wind, current, and SST data. This information is disseminated to mariners so they can safely transit the North Atlantic, but it is also used for flight planning purposes so the iceberg limits can accurately be logged.

I started working at the IIP in August 2021 as the Satellite Reconnaissance Branch Chief. It is an interesting time to be joining the IIP, as the use of higher resolution satellites is both changing and improving how operations are conducted. Except for the years during the two World Wars, the Ice Patrol has been active in the North Atlantic since 1913 and iceberg data has primarily come from ship reports and aircraft reconnaissance flights. Increased use of satellite data will not only aid in identifying the position and size of icebergs, but also create a more thorough and accurate record of iceberg numbers in the North Atlantic compared to previous methods. My time at ODU, specifically with regard to physical oceanography and ocean modeling, has already been invaluable to starting my work here at the IIP. For more information regarding the IIP or to check out the daily products we publish, visit our webpage at: https://www.navcen.uscg.gov/?pageName=iipProducts or email me at Shelby.k.henderson@uscg.mil.
CCPO Student Profile

NOAH HENDRICKS

When I first started at ODU in the fall of 2019, I had an interest in studying oceanography but did not have plans beyond completing a bachelor’s degree. I chose to follow the physical oceanography track in the Ocean and Earth Sciences program, and John Klinck was assigned as my academic advisor. He has been a tremendous help in my academic pursuits since then, whether that be suggesting classes that would be beneficial or interesting to take, or advice on searching for opportunities in research or graduate school. After doing a research paper on the impact of the Atlantic meridional overturning circulation (AMOC) on flooding along the U.S. East Coast in one of my courses, I decided to try to find an opportunity to do some research outside of my coursework. John put me in contact with Sönke Dangendorf in December 2020, and over the next few months, we developed some ideas for a research project, along with Tal Ezer, that I could work on at CCPO.

In May 2021, I began working in the student office at CCPO. My first goal was to investigate how different components of the AMOC affected sea levels in the North Atlantic Ocean. With the guidance of Sönke, as well as some input from Tal and John, I was able to find some interesting patterns, most notably a strong correlation between the Florida Current and sea levels along the American East Coast. This led to a focus on the factors affecting coastal sea levels, including the Florida Current strength, position of the Gulf Stream, and surface winds. Over the course of the summer and fall, Sönke and I have developed and tested many ideas in our research on this subject. This will hopefully result in a publication on how the strength and position of the Gulf Stream affects sea level rise in different areas along the East and Gulf Coasts.

In addition to gaining valuable research and coding experience through my project with Sönke, I have had the pleasure of getting to know some of the graduate students in the student office, like Mauricio González, Kayla Washington, and Claudio Iturra, among others. They have all been welcoming and friendly, and have shared their experiences in their academic careers and offered some helpful advice. My experiences and conversations with the professors and students at CCPO have led me to decide to continue studying physical oceanography in graduate school, after completing my bachelor’s degree. I plan to graduate from ODU in the next two years with a major in physical oceanography and minors in applied mathematics and physics.

LARRY P. ATKINSON ENDOWED SCHOLARSHIP

We would like to remind you about the Larry P. Atkinson Endowed Scholarship in the Department of Ocean and Earth Sciences at Old Dominion University (ODU). If you are interested in contributing to the scholarship, you may make a donation online by:

- Go to the secure giving website: https://secure.acceptiva.com/?cst=1c0e01
- Enter dollar amount and frequency that you’d like to give, select that you’d like your gift to support scholarships, type in “Larry Atkinson Scholarship” under scholarship name.
- Follow the prompts and provide your card and address information and press submit!
Imagine being over 500 feet above the sea surface (equivalent to being at the top of the Washington Monument), with just one other technician assisting you, and you’re counting on each other’s training in a moment of life or death. This article will describe what I learned about the safety training needed to be an Offshore Wind Service Technician.

With funding support from the state energy office (formerly DMME, now branded “Virginia Energy”), I was given the opportunity to be the first (and thus far, only) Old Dominion University Research Foundation (ODURF) employee to obtain Global Wind Organization (GWO) Basic Safety Training (BST). In January 2020, I traveled to the New College Institute (NCI) in Martinsville, VA, where I earned four of the five BST modules needed: working at heights, manual handling, fire safety, and first aid and CPR. In the near future, NCI plans to offer the fifth and final module, sea survival, which I hope to take then. This would then give me the minimum training needed to place a meteorological or oceanographic instrument on one of the Coastal Virginia Offshore Wind pilot turbines off Virginia Beach.

In the fall of 2019, thanks to the ODURF’s tuition reimbursement benefit, I also took an offshore wind graduate-level class, offered by the University of Massachusetts, Amherst, as part of its Offshore Wind Professional Certificate program. This provided an engineering and science perspective that has definitely been useful in my role as ODU’s Offshore Wind Program Specialist at CCPO, but I really wanted to experience first-hand what technicians face in the field.

Growing up with a single mother who would find a way to fix most anything—be it a broken bicycle, a wonky couch leg, or even building a kitchen counter from scratch—was an incredible example of a “CAN DO” attitude, and I’m grateful it’s something she passed on to me. I love understanding how a machine works, diagnosing a problem, and then repairing it, which I’ve experienced as a part-time mechanic for the past four years at D&J Auto in Portsmouth. So, I leapt at the chance to obtain GWO certification and look forward to obtaining my sea survival module.
Old Dominion University’s Institute for Coastal Adaptation & Resilience (ICAR) is partnering with the Chrysler Museum of Art to host a special exhibition focusing on the impacts of and mitigation strategies for climate change and sea level rise. CCPO is represented by Sönke and Lengxi Dangendorf and Tal Ezer, with several other ODU personnel contributing to the exhibit. Waters Rising: A View From Our Backyard is dedicated to Larry P. Atkinson, CCPO’s founding director. Visitors can experience this exhibition in the Focus Gallery of the Chrysler Museum of Art, located at One Memorial Place, Norfolk, Virginia 23510 through May 29, 2022.
**Presentations**

**Dangendorf, S.** Probabilistic reanalysis of global and regional sea-level rise and individual contributors over the 20th century, University of Texas, Austin, TX (virtual), October 2021.


**Ezer, T.** Air-sea interaction and modeling of hurricanes, typhoons and cyclones, The 10th training course on Regional Application of Coupled Climate Models, UNESCO/IOC Ocean Dynamics and Climate (ODC) Center, Qingdao, China (virtual), July 7, 2021.

**Ezer, T.** Climate change, sea level rise and links to changes in ocean dynamics, The 10th training course on Regional Application of Coupled Climate Models, UNESCO/IOC Ocean Dynamics and Climate (ODC) Center, Qingdao, China (virtual), July 8, 2021.


**Hofmann, E.E.** Understanding Controls on *Margalefidinium polykrikoides* Blooms in the Lower Chesapeake Bay, Department of Ocean & Earth Sciences Fall Seminar Series, Old Dominion University, Norfolk, VA, October 21, 2021.


**Knutson, T., M. Bender, R. Tuleya, and B.A. Schenkel.** Dynamical Downscaling Projections of Late Twenty-First-Century U.S. Landfalling Hurricane Activity, AMS Annual Meeting–20th Symposium on the Coastal Environment, Houston, TX, January 24, 2022.


**Schwana, E., B.R. Parizek, R.B. Alley, M. Morlighem, S. Anandakrishnan, D. Pollard, and P. St-Laurent.** Data-driven dynamics on Thwaites Glacier, West Antarctica, 2021 Fall AGU meeting, New Orleans, LA, December 2021.

**Publications**


Center For Coastal Physical Oceanography (CCPO) and Institute for Coastal Adaptation & Resilience (ICAR) Virtual Seminar Series

SPRING 2022 SCHEDULE

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MONDAYS at 3:30 PM EST

Streaming at: www.ccpo.odu.edu/seminar.html