An interview with Julie Rosati

Dr. Julie Rosati is the U.S. Army Corps of Engineers Engineer (USACE) Research & Development Center's lead Technical Director (TD) for Civil Works Research & Development (R&D), and TD for Flood and Coastal Risk Management R&D. Here, she oversees multi-disciplinary USACE research into flood and coastal risk management, navigation, and environmental restoration, as well as multiple federal agency and international partnerships. Through this, ERDC conducts fundamental and applied studies in collaboration with academic, agency, and nongovernmental partners to infuse innovation into the USACE's business processes, advance the state of knowledge, and improve technologies, methods, and tools.

Rosati's background is in coastal research, with focus on regional sediment management and regional sediment budgets, coastal inlet and adjacent beach evolution, barrier island migration, and quantifying coastal resilience. She serves as the Designated Federal Officer for the Board on Coastal Engineering Research, a federal advisory committee that provides R&D recommendations to the Chief of Engineers and the Assistant Secretary of the Army. She has bachelor's and master's degrees in civil engineering, and a Ph.D. in oceanography.

In the nomination which earned Rosati the 2023 Murrough P. O'Brien Award last October was perhaps the best summary of Rosati's many accomplishments in coastal engineering and management:

> *Dr. Rosati has given more than 40 years of service to the USACE and our coastal communities. In that time, her contributions she's made to the cause of beach management and preservation are immeasurable.… Her technical capabilities and contributions to coastal science and engineering alone make her more than deserving of this award, but to achieve all of these things through leadership with kindness and compassion that earns her respect from large groups of varying backgrounds, ranging from three-star generals to budding master's students. All of this and more makes her an exemplary nominee for our lifetime achievement award and an irreplaceable pillar within and outside of the USACE.*

Julie Rosati

■ **What is your background in coastal engineering?**

I began my career with a bachelor's in civil engineering and worked as a co-op student (work-study intern) for the U.S. Army Corps of Engineers' Coastal Engineering Research Center (now called the U.S. Army Engineer Research and Development Center, Coastal & Hydraulics Laboratory [ERDC CHL]) to help pay for tuition and provide more background in applied engineering. I liked the work so much that I continued working for the USACE ERDC CHL, which supported me in obtaining advanced degrees in water resources and oceanography with applications towards coastal engineering.

■ **Can you mention a favorite attraction for you about the coastal area?**

I love energetic, dynamic inlets and beaches with bluffs and a range of sediment sizes and types. It is awe-inspiring and humbling to experience the energy and power of these ever-changing coastal regions.

■ **During your career, what are some changes you have noted in the areas of coastal management, coastal engineering, and coastal science?**

The biggest change I've seen is the still-growing interdisciplinary nature of coastal research, science, and engineering applications. A coastal problem may have a straight-forward engineering solution, but that solution may not be viable because of broader environmental or societal or other concerns.

■ **Where do you see the next challenges for our coasts?**

Our nation's coasts have many that hold these areas as vital, precious, and functional. Conflicting interests have become more and more commonplace as beaches serve many purposes – recreation, a buffer to storms, providing ecological habitat, an economic driver for local and regional communities, aesthetics, food security, and many other uses. I see ongoing and future challenges continuing to be able to manage this diverse set of uses under a nonstationary climate.

■ **If you were to advise a young person thinking of studying coastal engineering or science, what would you say to them?**

Develop a broad base of knowledge to be more fluent in working on interdisciplinary teams to address these complex coastal problems. Take every opportunity to listen, learn, see, experience, and understand the underlying issues facing coastal communities.

■ **When did you decide to go into the coastal engineering field?**

I had a great teacher — my father, Robert Dean — who piqued my curiosity about the coast and inspired me to pursue a career in coastal engineering. During a holiday break from my undergraduate studies, I joined him and a team of students to measure beach profiles in Santa Barbara, California (Figure 1). We awoke at 4 a.m. each morning and finished around 6 p.m. each evening, to get as much of the beach surveyed as we could and take advantage of short daylight hours. Getting first-hand experience of the dynamic nature of coastal processes and beach change and learning more about the how the Santa Barbara Harbor structures impounded sediment opened my eyes to the complexity and dynamic nature of coastal systems.

■ **Who were the people before you who most influenced your work in**

coastal engineering or were the inspiration for your career?

My earliest inspiration was my dad who said work was his hobby! He often woke early on the weekends and was sitting at the kitchen table deriving an equation or writing a paper when I came down for breakfast. My dad's mentor — Morrough P. O'Brien — also inspired me, as well as Paul Komar, Rich Weggel, Tony Dalrymple, and James Houston.

■ **In thinking about your career in coastal engineering, what are the things you've done that you are most proud of?**

In my career, I have been so fortunate to experience many facets of coastal engineering — field work, lab work, writing numerical models, applying models, analytical work and transitioning knowledge into practice. I am most proud of my work with colleagues that are passionate about public service to make a difference in our nation. In these interdisciplinary, inter-organizational teams, we developed, improved and applied coastal engineering models and tools that made a difference in addressing national coastal problems. Examples include working with the U.S. Coastal Research Program and our interdisciplinary, multi-agency, academic, and nongovernmental organizational team to support academic research and solve problems of societal relevance (Figure 2).

■ **What do you think is the biggest threat to the coastal system?**

As a society we have disrupted our coastal systems to such a degree that we are having many unintended consequences. Climate change already is exacerbating impacts with more frequent and intense storms, and these compounding impacts will only increase in the future.

■ **What's your favorite beach and favorite type of beach material?**

I enjoy scavenging beaches for rocks, shells, and beach glass. I have a trove of seashells, rocks, agate, jade, and sand from around the world! There are three favorite beaches: Reynisfjara, Iceland, a black sand beach and columnar basalt cliffs; Ocean City Inlet, Maryland, with a rich morphologic history; and Scott Creek Beach, Davenport, California, with dynamic changes backed by bluffs.

■ **Where do you like to go for vacation?**

Figure 1. Santa Barbara Harbor, California (courtesy U.S. Army Corps of Engineers South Pacific Division, Los Angeles District).

Figure 2. The U.S. Coastal Research Program is a multi-agency, academic, and nongovernmental organization team supports research that impacts coastal communities. This photo shows a few of the U.S. Coastal Research Program leaders at the Department of Interior in 2019: (left to right) Mary Cialone, USACE-ERDC-CHL; Dr. Nicole Elko, ASBPA; Dr. Hilary Stockdon, USGS; Dr. Britt Raubenheimer, WHOI; Leighann Brandt, BOEM; and Dr. Julie Rosati, USACE-ERDC-CHL.

I like both mountains and beaches.

■ **Since this is for *Shore & Beach*, what article do you find yourself using and referencing over and over again?**

I greatly appreciate James Houston's *Shore & Beach* articles with clear analyses documenting the economic value of beaches, which he regularly updates. I utilize these articles as well as one of the older articles on inlets, "The Stability of Tidal Inlets" (Escoffier, 1940). Finally, I enjoy reading the earliest articles in *Shore & Beach* to better understand the value and impact of coastal engineering and how the field has grown — with many commonalities staying the same — since the 1930s.

■ **Do you have any final words of advice to young students about why they should consider a career in coastal engineering or coastal management?**

Beaches are our first line of infrastructure and economic driver to our nation. Any student looking for a challenging career that will really make a difference can find it in coastal science and engineering fields. Solving coastal problems is multi-disciplinary, so a student could go into many fields — ecology, computer science, civil engineering, mathematics, and others — eventually transitioning to a career in coastal, and get paid to work on the beach!