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NWS working with lifeguards to reduce rip current risk

A day at the beach is one of the joys of summer along the coast. Although a forecast for sunny skies and warm temperatures may indicate ideal conditions, a danger often lurks beneath the water's surface just offshore in the form of rip currents, which pose a significant risk to beachgoers and are responsible for more than 100 drownings each year in the U.S.

The National Weather Service has been incorporating rip current risk information in its coastal and marine forecast products for years, as well as providing rip current safety information to keep people safe and informed while at the beach. The NWS forecast office in San Diego decided to take things a step further when it began participating in a rip current monitoring program with several lifeguard agencies in the areas it serves. The program, developed by the NWS Meteorological Development Laboratory, or MDL, and supported by the NWS Office of Climate, Water, and Weather Services, is designed to reduce rip current hazards for beachgoers through improved situational awareness and forecasting.

"They've learned that we are just as passionate in our mission to protect lives as they are," said NWS San Diego Meteorologist-in-Charge **Roger Pierce** of local lifeguards involved in the program. "This has given our agency the credibility it needed for them to respond to our requests for cooperation."

The program has been expanded and now covers 15 beaches and includes NWS forecast offices in Melbourne, Fla., Northern Indiana, Chicago, Wilmington, N.C., New York, N.Y., and Jacksonville, Fla.

The hope among developers of the project is that it can continue to grow to include additional beaches and NWS forecast offices. "It would be great to see that a better surf and rip forecast product come to fruition from the cooperation and relationships established between the lifeguards, our [office] and MDL," said **Alex Tardy**, warning coordination meteorologist at the NWS San Diego office. "I would like to see our surf product used as a vehicle to increase awareness and promote safety."

Participating lifeguards issue reports, either once or twice daily. The reports alert the NWS to rip current and surf conditions on the beach. Other important beach characteristics, such as tide state

and swell direction (which may be different onshore than what an offshore buoy would report) are also relayed.

These observations provide valuable data to help improve the situational awareness of the participating forecast offices. According to **Noel Isla**, office observing program leader at the NWS San Diego office, "Strong rips can occur at any time, even when surf heights are in the 2-3 ft. range."

This past May, **Stephen Harrison** and **Cindy Palmer**, from the NWS San Diego forecast office, joined Pierce, Tardy and Isla on a visit to beaches along the Orange and San Diego County coasts, including Huntington, Newport, San Clemente, Moonlight and Mission Beaches. At each stop, lifeguard officials gave the visitors a tour of the beach, their facilities and the main lifeguard tower. They group also toured by boat coastal areas covered by Newport Beach and Mission Beach.

Lifeguard officials provided the San Diego office staff valuable operational information, such as local "problem areas" for rip currents, the direction of swells that bring the highest surf and coastal flooding, and areas along the beach that may experience coastal flooding. They also provided feedback on the effectiveness of NWS products and services and how they impact operations.

Back at NWS Headquarters, MDL staff are storing and evaluating the data sent by the lifeguards and comparing lifeguard reports to buoy observations and wave model data. By doing so, MDL hopes to develop rip current forecast guidance that can be tailored to individual beaches. This guidance could be used by forecasters to improve accuracy in NWS products that alert the public to the threat rip currents. A beach-by-beach approach is necessary, due to each beach's unique physical features, such as shoreline angle, slope, jetties, and piers, which can greatly affect the generation of rip currents. In addition, changing near-shore bathymetry, which may not be immediately evident without onsite observation, contributes to rip current intensity in ways that standard weather prediction methods may not address. Bathymetry information must therefore also be taken into account when developing diagnostic and forecasting methods.

An additional benefit to the collaboration with the lifeguards is the promise of improved communication and partnership between the NWS and the various lifeguard agencies, an important part of the agency's goal to build a Weather-Ready Nation.

"Of course, this didn't happen overnight, but in the course of several years," said Pierce. "They are excited that NOAA is working to improve the science of predicting dangerous rips, which can aid the lifeguard agencies in resource planning to better protect the lives of beachgoers."

B. Chris Brewster, President of the United States Lifesaving Association, who collaborated with NOAA on rip current education through its Sea Grant program, has been a strong advocate for creating partnerships between forecasters and the rescuers who must respond to changing rip current dynamics. Brewster noted that there are more than 40,000 rescues from rip currents in Los Angeles, Orange, and San Diego Counties each year.

“Most people have little ability to identify rip currents or rip current intensity, so NWS advice can have far reaching consequences,” Brewster said. “If there’s a disconnect between prediction and reality, credibility may suffer and beachgoers may make poor decisions. Conversely, if we can work together to improve the quality of NWS rip reports, we may be able to enhance the safety of beachgoers and lifeguards may be able to rely more confidently on NWS predictions.”