USING MARINE ANIMALS, VIDEO STREAMS AND SEWAGE SPILL ALERTS TO IDENTIFY THREATS TO COASTAL HUMAN AND ENVIRONMENTAL HEALTH

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Marine animals possess exquisite sensory capabilities, from echolocation in dolphins to the extreme chemosensory abilities of sharks. These capabilities far exceed mankind's abilities to develop equivalent sensors that are as robust, persistent, foul-resistant, and economical. We are therefore initiating a new sensor program in St. Augustine that leverages the innate abilities of local animals, as well as low-cost video systems, and existing infrastructure failure alert systems to detect abiotic and biotic phenomena of interest. Our goal is to understand animal behaviors well enough that sudden perturbations (chemical, weather, etc.) can be detected through changes in their behavior and use video data to quantify fluxes in vessel and wildlife traffic through coastal waters. Simultaneous, we are utilizing sewage spill data from existing public infrastructure data streams to assess patterns in the timing, frequency and magnitude of these pollution spills to evaluate when and where they may affect fish and wildlife being monitoring via our underwater and aerial systems. We have initiated our program by tagging red drum (Sciaenops ocellatus) with acoustic tags, installing a solar-powered video-monitoring system and developing sewage spill data algorithms, using St. Augustine, FL and its adjacent watersheds as our test bed. For the first time, this study aims to monitor water quality parameters (chlorophyll levels, E.coli, nitrogen, water velocity) via data-logging sondes while also simultaneously monitoring red drum via acoustic telemetry, vessel traffic and wildlife movements via video. This combination of underwater, aerial and infrastructure monitoring looks to correlate movements to broader physical processes. Our unique observatory network will represent a marriage of biogeochemistry, marine technology, fish physiology, human behavior and infrastructure performance to expand our understanding of coastal ecosystem responses to important environmental changes.

PRESENTER BIO: Dr. Angelini is a coastal ecologist and assistant professor at the University of Florida with more than 12 years of experience studying the spatial organization and resilience of coastal ecosystems. She has extensive experience with experimental ecology and restoration design. She is currently co-leading the *i*Coast initiative at the University of Florida to help innovate new methods for sensing hazards in the coastal zone.