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COASTAL ENVIRONMENTAL SENSING NETWORKS II- SENSOR APPLICATIONS

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Sensor, network, real-time data, environmental, coastal, application

The call of the sea, whether for resources or aesthetics, is integral to humanity. Fifty percent of the US population lives within 100 km of the coast and the influx continues as more people migrate to the coastal edge. This concentration of humans significantly impacts coastal zones (e.g. eutrophication, over fishing, habitat alterations, and air pollution). Simultaneously, coastal environments impact human activities (e.g., location of transportation hubs, design of ports, protection from water erosion and major storms). The question of how to effectively manage the problems (resource management, transportation, homeland security, recreation planning, and biodiversity conservation) arising from these impacts is being faced by a diverse range of managers and stakeholders including federal, state and municipal governments; coastal communities and property owners; and coastal and upstream agricultural and industrial businesses.

The emerging field of wireless sensor networks (potentially $5-7 billion in the next 5-10 years) will play a central role in supporting the data needs for sustainable development of coastal areas. The expertise needed to develop successful sensor networks in coastal areas will need to address significant challenges that include: 1) limited power and coverage for coastal environmental sensor networks, 2) limited menu of available robust environmental sensors 3) lack of infrastructure and expertise to design efficient sensor networks, 4) need for linking GIS, land-based models, and ocean-based models to mine environmental sensing data to forecast environmental impacts and share them with the community 5) lack of research on “smart” sensor networks in coastal areas.

A series of three Panel Sessions on Coastal Environmental Sensing Networks will explore sensor network technology, sensor applications, and policy and management-related information and technology needs. This Panel Session (CESN II: Sensor Applications) will explore the applications of sensors to problems of social, environmental, and economic importance on personal, regional and global scales. Successes as well as failures of sensor applications, sensor applications within sensor networks, and unexpected applications of sensors will be highlighted by panelists from academia, industry, and government. The audience is encouraged to gain a better understanding of a wide range of sensor applications and benefit from some lessons learned about applying new sensors to coastal, environmental problems.

Applications presented are expected to include 1) Oceanographic monitoring for studying global climate change, 2) Personal biosensors for monitoring human health, 3) Mobile environmental sensors for assessing ecosystem health, and 4) Ship-board sensors to regulate invasive species transfers. Oceanographic sensors have to be extremely robust, calibrated for long-term deployment, and insensitive to biofouling. Personal biosensors need to be small, lightweight, and unintrusive. Mobile sensors need to be able to transmit when within range of the network, yet store data while not in the network. Sensors applied to regulations must be tamper-proof, robust, and easy to use. The presentation of this wide array of sensor applications should make for interesting discussion and brainstorming about future sensor applications.

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