



## Why ESi

ESi helps clients understand hurricane-related damages to homes, neighborhoods, infrastructure, industrial facilities, and the environment. Our capabilities include performing damage assessments related to hurricane-induced storm surge, flooding, and direct rainfall. We are well-versed in establishing causation of damages relying on observations collected during site inspections, event data and information, and custom-built numerical models that we can prepare based on the scope of damages and a client's needs.

For over 30 years, ESi has leveraged its multidisciplinary team of engineers, scientists, and professional technical staff to investigate accidents and disasters.

Our technical expertise, hands-on experience and state-of-the-art facilities, combined with diagnostic, analytical, and physical testing capabilities create an ideal environment to quickly identify and interpret the facts of a case.

## Contact Us



Learn more from an ESi expert.

**Pravi L. Shrestha, Ph.D., P.E., D.WRE, D.CE**  
ESi Senior Managing Consultant

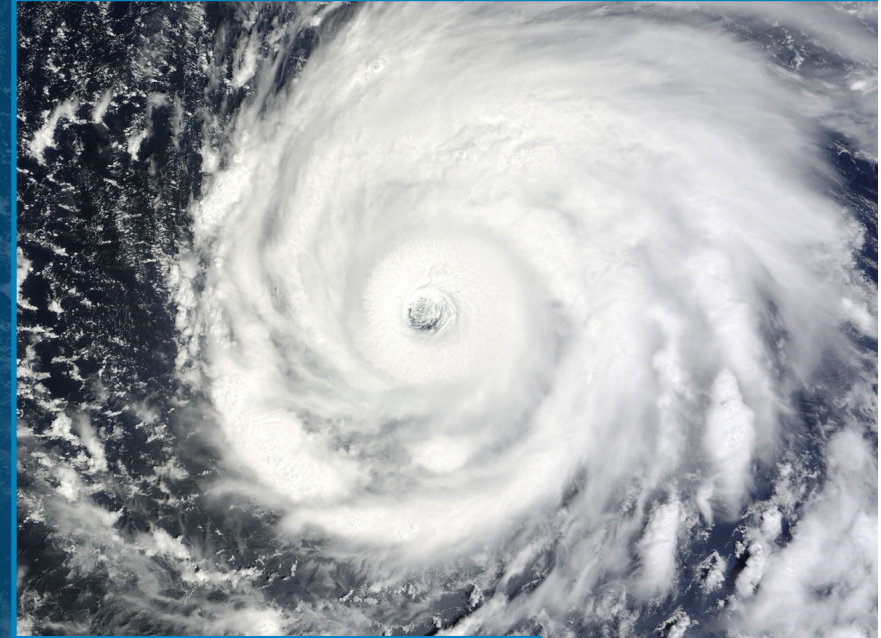
Dr. Pravi Shrestha brings over 30 years of experience in water resources and environmental engineering. Well-regarded for his expertise in hydrodynamics and sediment transport, Dr. Shrestha has consulted nationally and internationally.

You can reach Pravi by email at [pshrestha@engsys.com](mailto:pshrestha@engsys.com) or phone 949.336.9001

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## Scientific Spotlight

# Hurricanes & Storm Surge



Engineering Consulting  
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# HURRICANES & STORM SURGE



Storm surge, represented by the difference in water level between a storm tide and an astronomical tide, is an abnormal rise of water that impacts a coastline during a storm.

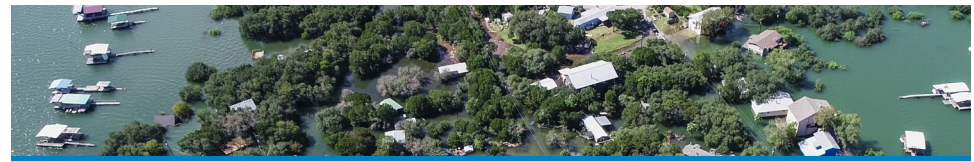


Storm surges that result from a hurricane or tropical storm are a principal cause of coastal flooding, adversely impacting coastal structures and endangering life and property.

Coastal features such as breakwaters, sand dunes, and barrier islands can reduce coastal flooding



Coastal flooding is influenced by wind, waves, tides, water depth, and topography. Timing is important: A storm surge at high tide results in water levels that are higher compared to the same storm surge at low tide.



The presence of long, narrow estuaries can increase storm surge as a result of a “funneling” effect.



High river flows coinciding with a storm surge also contribute to high water levels. Coastal topographic features such as floodwalls and levees, breakwaters, sand dunes, and barrier islands reduce storm surge, wave impacts, and coastal flooding.



Topographic features can be damaged or reshaped by large storm events resulting in catastrophic inland flooding. Such events may even result in changing flood zones, which may warrant an update to Federal Emergency Management Agency (FEMA) Flood Insurance Rate Maps (FIRMs).

A funneling effect can take place from long narrow estuaries, increasing storm surge