

The Role of a Consultant

- The role of coastal science/engineering consultants varies based on the needs of the client:
 - Hazard Determination
 - Mitigation Planning
 - Considerations for Future Development
 - Design/Build of Coastal Systems/Structures
 - *Helping you determine your risks and needs*

The role of a consultant is driven solely by the client's needs. Sometimes an FPM or official knows exactly what they want, sometimes community officials don't know what they don't know. In either case, a consultant's job is to provide support so that the client can find a path forward (and maybe they need help with that, also). It's also possible that a consultant gets halfway through a project and makes discoveries that can change the direction of project, and although this can be challenging it can often result in a better understanding of what the full picture of hazards is for a location.

Potential projects include: determining hazards for an area (flooding, sea level rise, erosion, etc.); mitigation planning; determining where future development will have the least impact on flooding; design and build of flood protection projects or nourishments; helping a client determine what their risks and needs actually are.

Floodplains are complex systems, so what appears to be straight-forward issues on the surface may not actually be so cut-and-dry.

Project Types

- Shoreline change analyses
- Recommendations for future zoning and development
- Design and build of a flood protection structure or beach nourishment
- Hazard evaluation; current and future
- Shore protection system design and build

Common coastal project types can include things like:

- Shoreline Change Analysis; determining erosion issues, channel movement, inlet migration, etc.
- Modeling floodplain changes to determine development impacts; Manually creating changes in topography data and modeling inputs to see how future development in different areas of the community may impact flooding downstream. This can allow for restriction of development in areas that would have negative overall impacts for the community.
- Design/Build of flood protection projects; Standard projects most people are familiar with (seawalls, revetments, beach nourishment, dams, etc.).
- Hazard evaluation; Determining what the current and potential future risks are and modeling impacts. This can include risk changes due to sea level rise (wave hazards, salt water intrusion, sunny day flooding).
- Shore protection systems; Very similar to flood protection projects but including things like living shorelines, marsh/riverine restoration, and oyster reef construction.

Project Examples

- Living shoreline and seawall design for NOAA facility on Cooper River
- Living shoreline study for SCDHEC
- Shoreline change assessment/facility vulnerability report for NASA

- Wave hazard assessment for marsh community considering sea level rise
- Sea level rise vulnerability study
- Floodplain change study for future development

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Recent examples of projects our team has completed:

- Living shoreline and adaptive seawall design for NOAA facility in Charleston. Seawall is expandable (will accept another cap) to account for future flooding risk from sea level rise. Living shoreline includes oyster reef, marsh, and small maritime forest buffer for shoreline protection and wave risks.
- Living shoreline modeling for SCDHEC to provide data for their living shoreline guidelines development.
- Marsh system shoreline change assessment and future vulnerability for Kennedy Space Center.

Examples of recent projects seen across the industry:

- Future wave hazard and sea level rise inundation for marsh communities. Helping communities understand what the future risks are for increasing wave/storm hazards, sea level rise inundation, and risks to residents/facilities.
- Sea level rise vulnerability studies. Examining the risks of increased nuisance flooding, increased storm inundation and wave hazards, determining what areas are at higher risk of future flood activity.
- Floodplain change study to investigate future development. Although not always helpful in the coastal floodplain, this is becoming common for riverine areas. Communities that know where their development primarily occurring can “simulate” filled and/or newly developed areas and determine what the potential impacts to their flooding would be. This can allow communities to direct development to areas that have less impact on their floodplain and carry a lower risk.

Helpful Links

- NOAA DigitalCoast (Tools, Data, Training):
<https://coast.noaa.gov/digitalcoast/>
- SCDHEC/Nature Conservancy Living Shorelines viewer:
<https://maps.coastalresilience.org/southcarolina/living-shorelines/>
- US Army Corps (new) International Guidelines on Natural and Nature-Based Features for Flood Risk Management:
https://ewn.erdcdren.mil/?page_id=4351

- NOAA DigitalCoast has a wealth of free federal and state data, along with tools to help communities plan. Apart from elevation data, there are marsh migration tools, a sea level rise viewer, and land use change data to help you visualize or environment (MAKE FRIENDS WITH YOUR GIS DEPARTMENTS!!)
- For communities interested in whether a living shoreline is right for them instead of hardened or “grey” infrastructure projects, SCDHEC in coordination with the Nature Conservancy has a viewer that can help you decide if a living shoreline would be feasible in your area.
- USACE has released a brand new manual (yes, manuals are gross but this one is actually very helpful and well-put together) that outlines what kinds of nature based solutions are available (and effective) for flood risk management. It can give you a basic idea of what kinds of projects may be appropriate for you and some general design aspects.

**It's very important to note that, when it comes to coastal flood risk management projects, there are not a lot of hard and fast rules and green solutions are very much “try it and see if it works”. As a general rule of thumb, look at the environments that function well in your area and see if there are available solutions that mimic those environments (oysters, marshes, maritime forests, etc).