

Floodplain Analysis, Mapping, and Management

Values

Rivers and their associated floodplains serve a variety of important natural functions including conveying water and sediment, storing flood waters, and providing diverse habitat. Floodplains however, are also prime areas for agriculture and commercial and residential development that may be prone to flood damage. Floodplain analysis and management seeks a balance between conserving natural functions and reducing flood risks.

Services

NHC conducts studies for a broad range of floodplain applications.

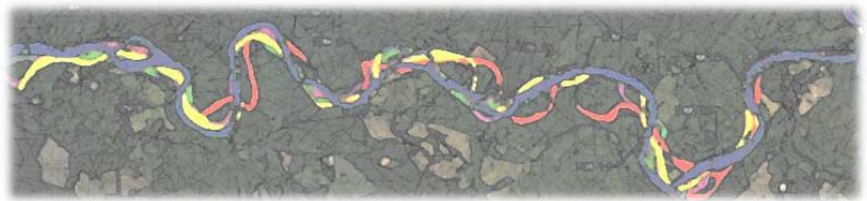
OUR SERVICES INCLUDE:

- Hydrologic analyses and numerical modeling of watersheds to determine key river flows
- Numerical hydraulic modeling of complex within-channel and overbank flow scenarios
- Flood risk assessment and mapping of flooded areas for specified return periods (e.g., 100-year flood)
- Planning and design of flood protection such as dikes and levees
- Designing habitat restoration features to reestablish or enhance natural functions
- Geomorphic assessments of natural and man-made changes to the channel regime
- Analysis and management of sediment-related issues



Technical Approach and Capabilities

NHC investigates and analyzes floodplains ranging in size from small urban streams to the world's largest rivers, and in geomorphic settings from alluvial fans to major river deltas. We participate in small-scale restoration projects and conduct flood risk assessments and mapping for major rivers. Regardless of project scale or setting, we emphasize the need for sufficient basic data, a thorough understanding of the hydraulics and morphology of rivers and floodplains, and close attention to the objectives of the project and the client.

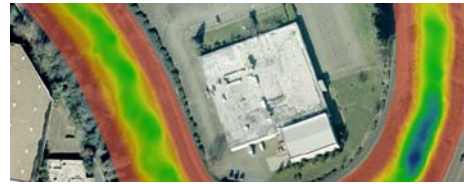


Experience

NHC has conducted floodplain studies on behalf of government agencies and private clients in North America and internationally. Examples include:

▪ Flood Hazard Reduction

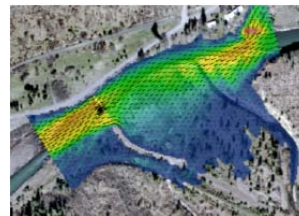
NHC has conducted many studies to understand complex flood behavior and reduce flood hazards. These studies often incorporate sophisticated numerical modeling tools, GIS, and innovative statistical approaches.



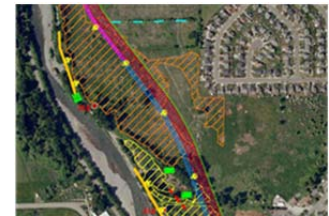
Levee certification along the Green River, Kent, WA

▪ Habitat Restoration

NHC regularly integrates an understanding of physical processes, engineering knowledge, and economic challenges to restore natural function to rivers and floodplains.



River engineering evaluation and geomorphic assessment Klickitat River, WA



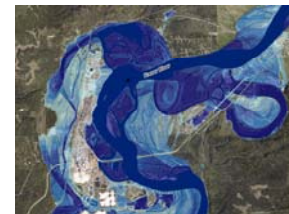
Levee setback design on the Puyallup River, WA

▪ Regulatory Compliance

NHC has provided floodplain services for permit applications to comply with local, state, and federal flood regulations including levee certification, shoreline mapping, and analysis and mapping of pre- and post-project conditions.

▪ Risk Assessment and Mapping

NHC has assessed flood hazards within the floodplain for many projects, including dam failure analyses. Information is provided to clients and the public in clear, detailed, and educational maps.



Assessment of floodplain hazards and habitat, Fraser River, BC

Benefits

Analysis of floodplain hydraulic conditions allows public agencies and developers to quantify flood risks and, if necessary, impose proper protections and allow communities to coexist with the natural environment. Knowledge gained from analysis can reduce flood risks to life and infrastructure, and enable the maintenance or restoration of habitat diversity.

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