

Maine Flood Resilience Checklist **Summary and Recommendations Report**

Name of Community: Vinalhaven

Date of Workshop: October 20, 2018

Location of Workshop: Union Church, East Main Street, Vinalhaven

Facilitators: Jamie Francomano, Mid-Coast Regional Planning Commission; Leticia vanVuuren, Knox County Emergency Management Agency; Abbie Sherwin, Southern Maine Planning & Development Commission

Note-takers: Jamie Francomano, Leticia vanVuuren, Abbie Sherwin, and Emily Cohn, Vinalhaven School

Participants: See Attachment 1

Summary

In October of 2018, the Town of Vinalhaven completed the *Maine Flood Resilience Checklist*, a non-regulatory assessment tool designed to assist communities examine local flood risk, evaluate vulnerability to coastal flood hazards, and identify specific actions for enhancing community-wide flood resilience. The process entailed a day-long workshop during which Town staff, volunteer committee members, and interested residents participated in a facilitated discussion about flood hazards and worked through the Checklist assessment questions.

To frame discussions and inform responses to the Checklist questions, participants began the workshop by examining and discussing maps depicting local inundation associated with the following flood scenarios: the 100-year storm or one percent annual chance storm (*i.e.* the regulatory floodplain delineated by FEMA), 1 foot, 3.3 feet, and 6 feet of sea level rise, and storm surge from a category 2 hurricane. The maps and resulting discussions helped set the stage for participants to engage in a conversation about specific local flood vulnerabilities, discuss and answer the Checklist questions, and identify mitigation and adaptation strategies the Town can employ to enhance its resilience. The facilitator noted that the maps were based on data that have since been updated by national and international scientific agencies and that newer, peer-reviewed data published in 2017 indicate that sea levels will potentially increase by more and at a faster rate than previous studies projected, by as much as 11 feet by 2100. Thus, it was emphasized that Vinalhaven should consider a range of potential sea level rise scenarios in its planning initiatives, rather than selecting one sea level value for a given year, and ensure that those initiatives are flexible to allow for changes in projections of and actual sea levels.

As an island community that is intrinsically tied to the sea, Vinalhaven has unique vulnerabilities to coastal flood hazards. Extreme high tides and storm surge are already resulting in significant flood impacts to areas in Town, including Main Street, North Haven Road, the ferry landing, the causeway to Dyer's Island, and Clamshell Alley. The Town has already taken steps to assess and address coastal flood vulnerabilities through initiatives such as establishing a municipal Sea Level Rise Committee, undertaking a grant-funded detailed vulnerability assessment of Carver's Harbor, and pursuing technical assistance and expertise for envisioning a more resilient downtown through the Design and Resiliency Team grant program. Moving forward, it is imperative that the Town continue its resilience efforts with consideration of planning horizons in relation to changing flood risk and recognition that there are time lags associated with the implementation of planning strategies and the realization of

results and impacts of those strategies. With this in mind, the Town of Vinalhaven has a valuable opportunity to identify and implement planning, policies, and strategies today that will reduce its vulnerability and protect its natural, social, and built assets in the future as local flood risk becomes more severe. Several such planning initiatives and actions for the Town to undertake were identified by workshop participants and are listed in this document. Additionally, potential actions for the Town to take, as recommended by Checklist process facilitators, are also identified.

Action Items Identified by Workshop Participants

- Incorporate sea level rise and other coastal hazards into the Town's Comprehensive Plan.
- Document local and departmental knowledge about flood hazard information including vulnerabilities, impacts, and response.
- Share information about local flood hazards, vulnerabilities, and resilience planning with the Board of Selectmen volunteer boards and committees, residents, and visitors.
- Conduct outreach to local businesses about flood vulnerabilities and assist businesses with flood hazard preparation, adaptation, and mitigation actions.
- Coordinate with Knox County Emergency Management Agency (EMA) to develop Town-wide and area-specific GIS maps depicting coastal flooding scenarios and the locations of resources, facilities, and infrastructure of interest.
- Add flood hazard information (*e.g.*, inundation associated with different scenarios of sea level rise and storm surge) as layers to an online GIS system to way to increase awareness of local flood vulnerability among Town staff, elected officials, and the general public.
- Coordinate with Knox County Emergency Management Agency (EMA) to develop a GIS-based boundary delineating the highest annual tide (HAT), or another more protective boundary, for Shoreland Zoning.
- Utilize scenario-based planning to account for variations in predicted future sea levels and associated time horizons and take action to implement adaptation and mitigation initiatives, even in the face of uncertainty. This will require municipal staff and officials to discuss and determine appropriate planning horizons and risk scenarios for the Town to plan for in its decision-making and policies.
- Develop and adopt a formal policy requiring all municipal projects to consider, and mitigate to the greatest extent practicable, existing and potential future impacts of coastal flooding, storm surge, sea level rise, and coastal erosion/shoreline change. Future impacts should be based upon the project's anticipated useful life cycle and the corresponding sea level risk scenarios identified by the Town's planning horizons.
- Develop and implement a formal protocol for documenting and tracking maintenance, repair, and upgrade activities and associated costs related to flooding impacts to municipal infrastructure and facilities.
- Collect surveyed elevation data on municipal facilities infrastructure and incorporate the data into a GIS map to overlay flood hazards to identify infrastructure and facilities that will be inundated under certain flood scenarios. Examples of facilities and infrastructure to collect elevation data for include the fire stations and stormwater and wastewater treatment and transport systems.
- Incorporate adaptation and mitigation actions, information about anticipated short- and long-term costs and benefits, and post-hazard repairs and cleanup in maintenance plans and budgets for Town-owned critical infrastructure and facilities.

- Develop and implement plans and backup systems for critical infrastructure and facilities to ensure continuation of function of services during and after flood hazard events.
- Incorporate resiliency criteria, flood hazard information, and adaptation and mitigation strategies into capital improvement plans for municipal infrastructure and facilities.
- Investigate opportunities to protect, elevate, and/or relocate wastewater and water treatment plants, pump stations, and other associated infrastructure to reduce vulnerability to flooding.
- Consider developing a town-specific hazard mitigation plan that is more locally tailored than the County Hazard Mitigation Plan and addresses potential future flood hazards including sea level rise, storm surge, and increased precipitation. Share plan information with Knox County Emergency Management Agency.
- Reassess evacuation routes and, where possible, develop strategies for rerouting and/or elevating roads above flood elevations.
- Coordinate with the Maine Department of Transportation to conduct a detailed study of flood vulnerability and adaptation and mitigation strategies for the ferry terminal.
- Coordinate with the Maine Department of Environmental Protection to identify ways the Town can adapt its post-storm recovery plans to enhance protection of environmentally sensitive or significant areas.
- Investigate threat and impacts of saltwater intrusion at Folly Pond and develop and implement actions to protect the drinking water supply.
- Review post-storm recovery plans for standards that ensure the protection of environmentally sensitive areas.
- Collaborate with Knox County Emergency Management Agency to develop a volunteer-based program to document shoreline change and erosion rates around the Town.
- Consider developing and adopting a local hazard disclosure policy requiring disclosure by real estate agents, private sellers, and/or by municipal officials for properties located in the 100-year floodplain and/or other flood hazard areas (*e.g.*, storm surge, sea level rise, *etc.*).
- Work with the Town's Assessors office and Knox County Emergency Management Agency to assess the economic impacts of coastal flooding, storm surge, and sea level rise on the Town's tax base (*i.e.* value of private property impacted and associated tax revenue).
- Document, continue, and expand upon existing efforts regarding flood hazard and disaster education and outreach activities tailored for the school-age population and general public.
- Install signage that identifies flood depths associated with historical flooding events and sea level rise and storm surge in the downtown area to increase local flood risk awareness and earn CRS credit.
- Complete the National Weather Service's Storm-Ready designation process.
- Implement the use of reverse 911 and IPAWS (for cell phones) call systems to notify residents and visitors of impending storms, flooding events, and other potential disasters.
- Consider and incorporate marsh migration analysis findings in land use regulations.
- Develop in-house capacity for GIS mapping and analysis.
- Join FEMA's Community Rating System (CRS) and use the Checklist as a guidance document for identifying creditable activities.

Action Items Recommended by Process Facilitator

- Develop a web-based "living" mapping tool to document flooding events and impacts; future flood hazards (*i.e.* storm surge and sea level rise scenarios); locations of key municipal assets,

facilities, and infrastructure; vulnerable areas of the Town; and other pertinent information that will assist the Town capture, understand, and assess flood hazards, impacts, and adaptation and mitigation options. The mapping tool can also be used to identify locally-tailored land use regulations and policies to protect vulnerable areas from flood hazards and evaluate possible adaptation and mitigation actions.

- Develop and implement a standardized, cross-departmental protocol for documenting and assessing local flood impacts and related information. The protocol should establish criteria for what storm events and impacts trigger documentation. Documented information could include the location, cause, duration, depth, and date of flooding, resulting damage and other impacts, photographs, and response and repair activities. Consider integrating the documented information in Knox County EMA GIS any potential future GIS program for the Town.
- Consider modifying and strengthening the Town's floodplain ordinance through some or all of the following measures: adopt higher freeboard requirements for development in areas subject to existing and potential future flood hazards based on projected water depths associated with sea level rise, storm surge, and increased precipitation; apply the floodplain ordinance to flood hazard areas that extend vertically and/or horizontally beyond those identified as the regulatory 100-year floodplain to account for more intense storm events; limit or prohibit new development in the regulatory floodplain; revise and adopt a regulatory floodplain map that includes both the FEMA-designated 100-year floodplain and areas vulnerable to sea level rise; and establish development standards to reduce flood vulnerabilities in areas subject to inundation from sea level rise and storm surge.
- Establish a sea level rise/storm surge zoning overlay district to encompass areas vulnerable to potential future flooding and develop and adopt accompanying regulations to ensure new and substantially improved structures are elevated above projected flood depths.
- Establish a municipal fund or grant program to support coastal adaptation and resiliency work.
- Consider implementing an impact fee, other fee-based program, and/or tax increment finance district (TIF) to support resiliency and adaptation projects in areas vulnerable to coastal flood hazards.
- Conduct a study to better understand how increased stormwater from more intense and frequent precipitation events will interact with storm surge and sea level rise and the resulting flooding impacts.
- Consider offering incentives, financial or otherwise, (*e.g.*, waiving application or permit fees for new development and construction) for property owners that voluntarily implement flood risk reduction practices on their property (*e.g.*, voluntary elevation of structure above a specified flood level, stormwater retention/treatment, *etc.*).
- Inform property owners and prospective buyers of flood risks associated with the 100-year storm event (*i.e.* regulatory floodplain) to their property. Consider informing property owners and prospective buyers of sea level rise vulnerability and consider developing and adopting a hazard disclosure policy for informing property owners, residents, and prospective property buyers of risks from flooding, sea level rise, and storm surge.
- Require any new critical facilities and infrastructure and future development to be located outside of coastal or flood-prone areas. Alternatively, require all municipal facilities and infrastructure located in flood hazard areas to be elevated or floodproofed to at least the 0.2% (*i.e.* 500-year) flood elevation, 3 feet above the 1% chance (*i.e.* 100-year) flood elevation, and/or anticipated inundation depth associated with sea level rise and/or storm surge, where appropriate.

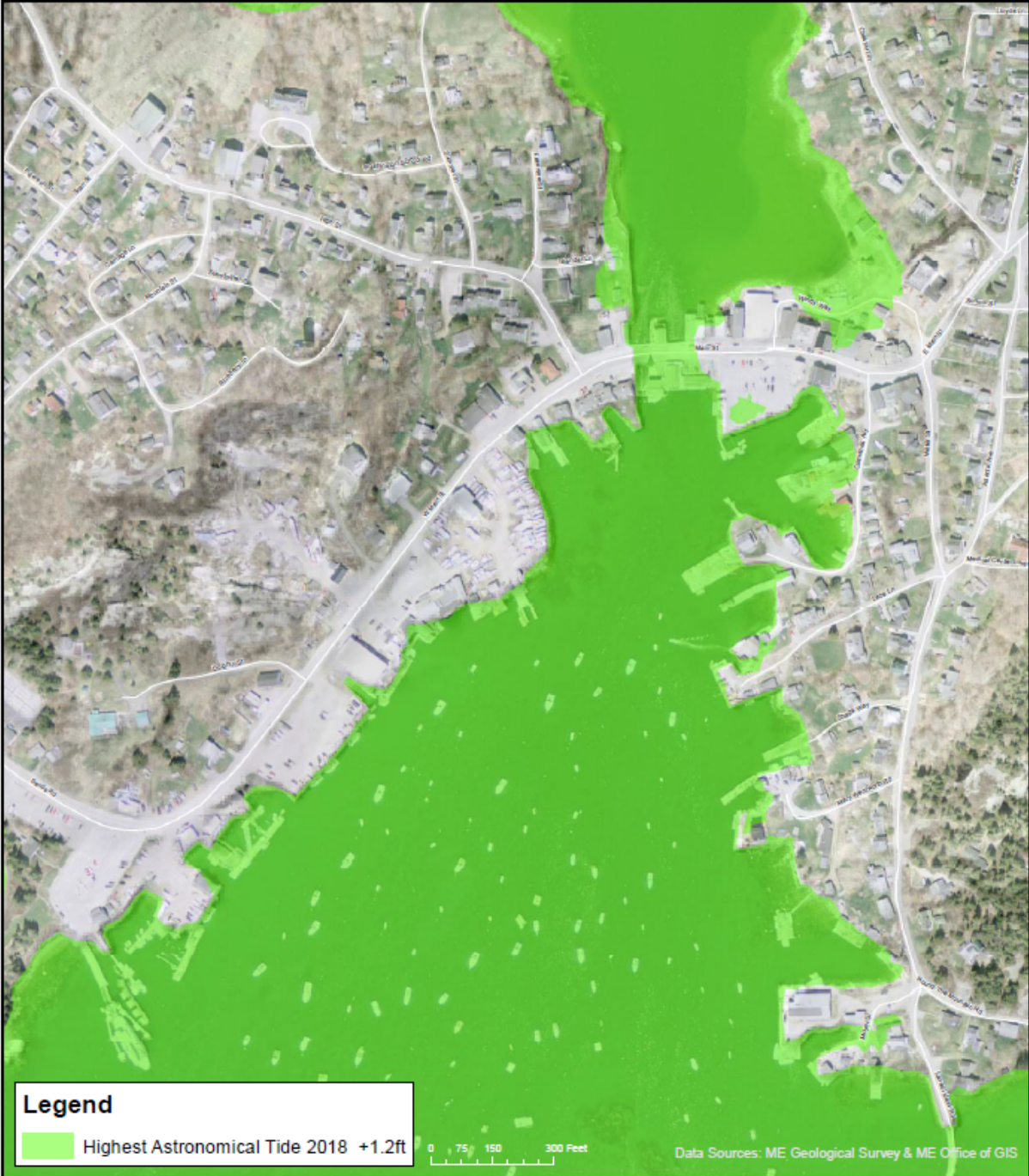
- Enhance the Town’s existing land use regulations and policies that encourage the use of green infrastructure approaches for stormwater management and consider developing advanced requirements for properties located in areas vulnerable to flooding, storm surge, and sea level rise.
- Develop recommendations for adaptation/protection, relocation, and/or abandonment of Town-owned critical infrastructure and facilities located in flood hazard areas and investigate funding options.
- Incorporate existing and potential future flood hazard considerations in the Town’s economic development plans and strategies.
- Identify and prioritize frequently flooded areas or those subject to inundation from sea level rise and storm surge for acquisition, easements, and/or open space preservation.
- Investigate the use of living shorelines and open space to protect beaches, marshes, and coastal development from erosion and flooding.
- Determine whether or not there are any repetitive loss properties, as defined by the National Flood Insurance Program, in Town. If there are, pursue coordination with property owners to investigate opportunities for buy-outs or adaptation measures.

This report was prepared for the Town of Vinalhaven by the Southern Maine Planning and Development Commission under award CZM NA17NOS4190116 to the Maine Coastal Program from the National Oceanic and Atmospheric Administration, U.S. Department of Commerce. The statements, findings, conclusions, and recommendations are those of the author(s) and do not necessarily reflect the views of the National Oceanic and Atmospheric Administration or the Department of Commerce.

Appendix A: Participant List

Name	Title or Affiliation
Andy Dorr	Town Manager
Faye T. Grant	Town Code Enforcement Officer
Marian Grogan	Sea Level Rise Committee
Linnell Mather	Sea Level Rise Committee
Ann C. Kirkpatrick	Vinalhaven School
Emily Cohn	Vinalhaven School
Robert S. Warren	Fisherman
Patricia Lundholm	Ambulance/EMT
Sarah Crossman	Tidewater Motel
Carol Thompson	Community Outreach
Marjorie Stratton	Chebeague Island Town Manager
Jeremy Gabrielson	Maine Coast Heritage Trust
Robin Chernow	Hurricane Island Foundation
Kate Tagai	Island Institute
Marc Candage	Fire Chief, Ambulance, EMT
Chip Farrington	General Manager, Electric Co-op
Eric Davis	Land Trust, Waste Watchers, roads, waterfront
Pam Alley	Board of Selectmen, Water and Sewer District Boards
Patrick Trainor	Water and Sewer District Boards
Kathy Warren	Town Planning Commission
Jim Knowlton	Harbor Master
Margaret Qualey	Sea Level Rise Committee, Downtown Committee

Appendix B: Sea Level Rise and Storm Surge Inundation Maps



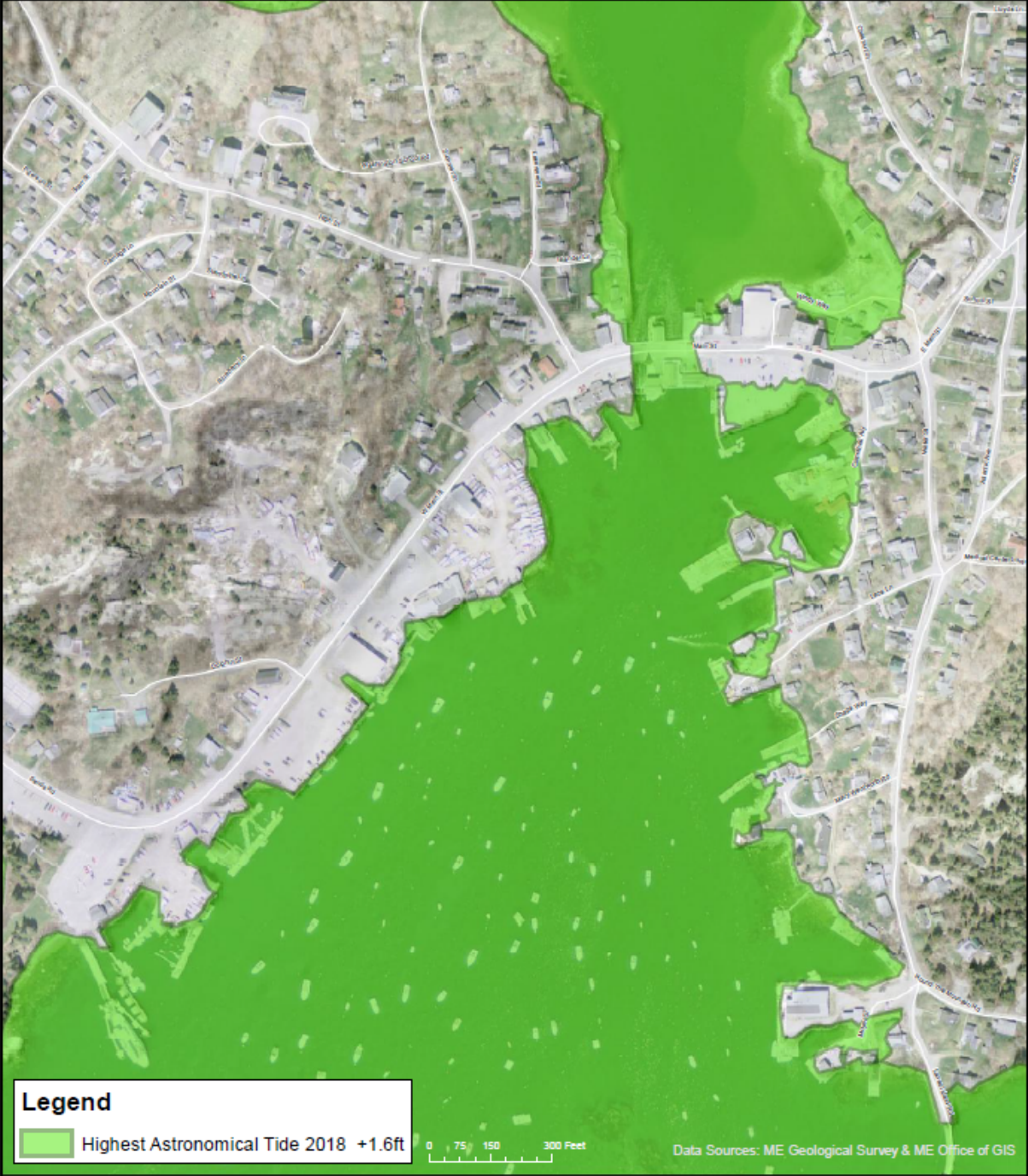
Town of Vinalhaven - Carvers Harbor
Highest Astronomical Tide 2018 +1.2 ft

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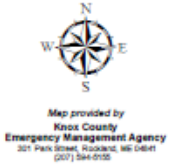


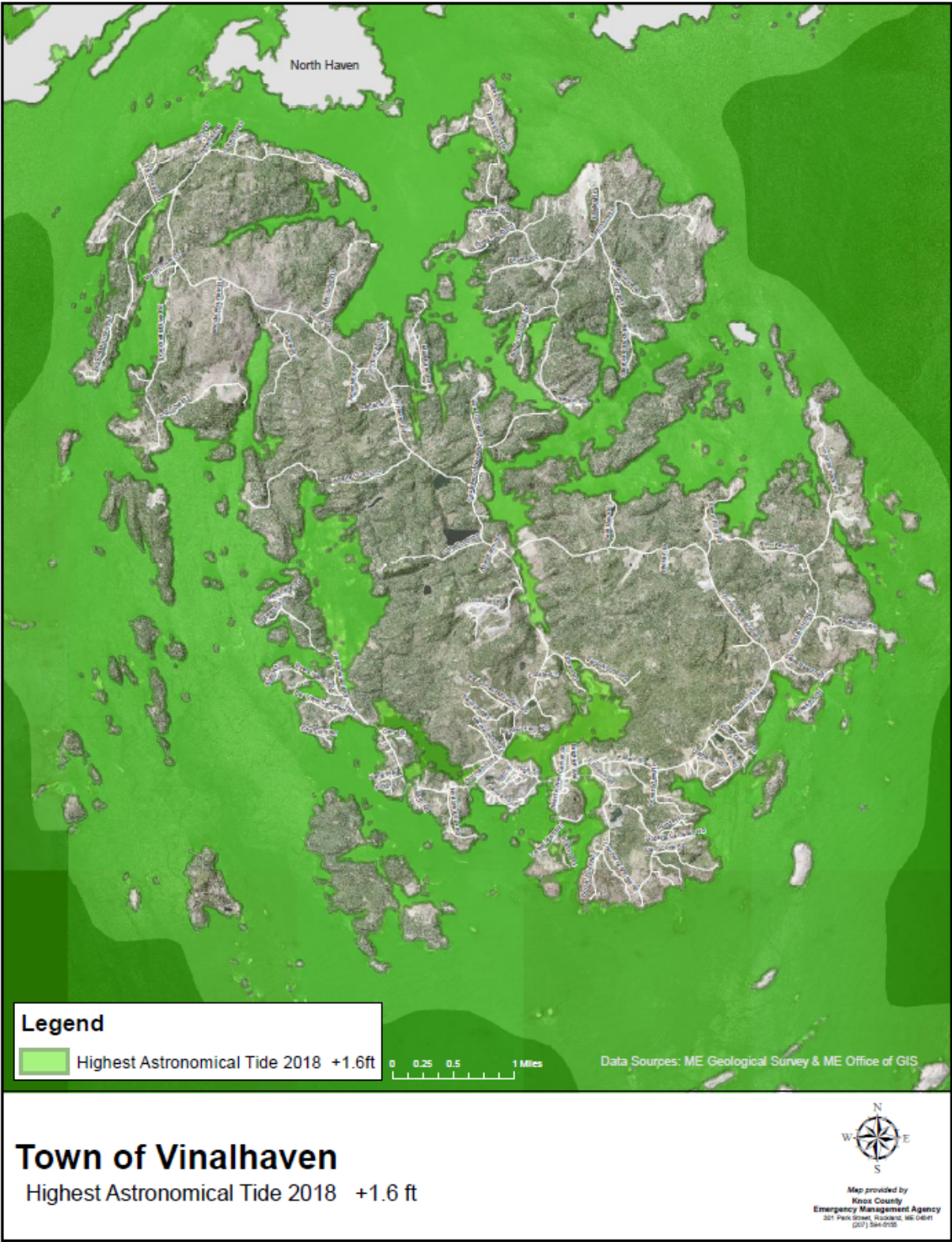
Town of Vinalhaven
Highest Astronomical Tide 2018 +1.2 ft

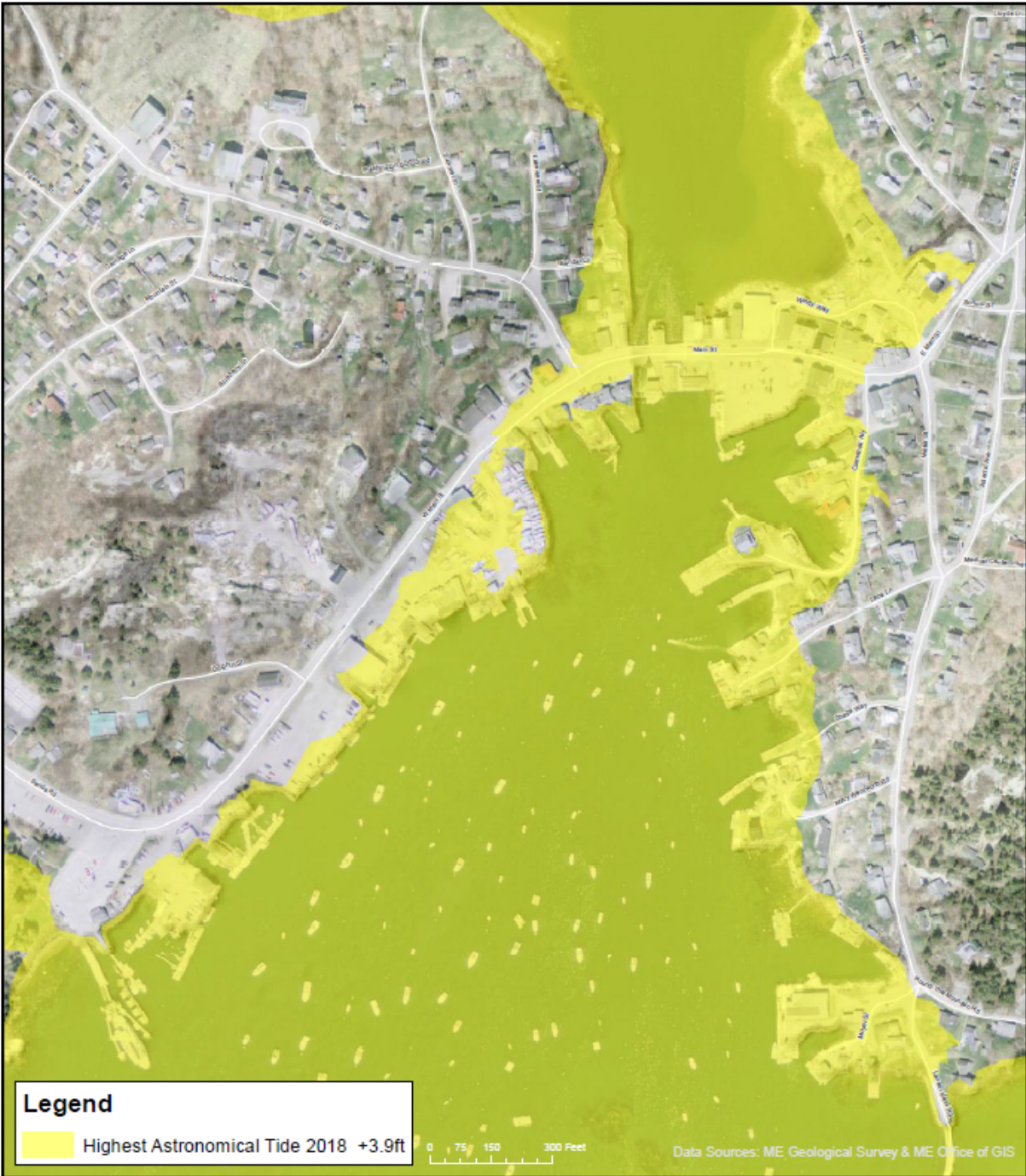
Map provided by
Knox County
Emergency Management Agency
307 Park Street, Hallowell, ME 04847
(207) 846-0155



Town of Vinalhaven - Carvers Harbor
Highest Astronomical Tide 2018 +1.6 ft

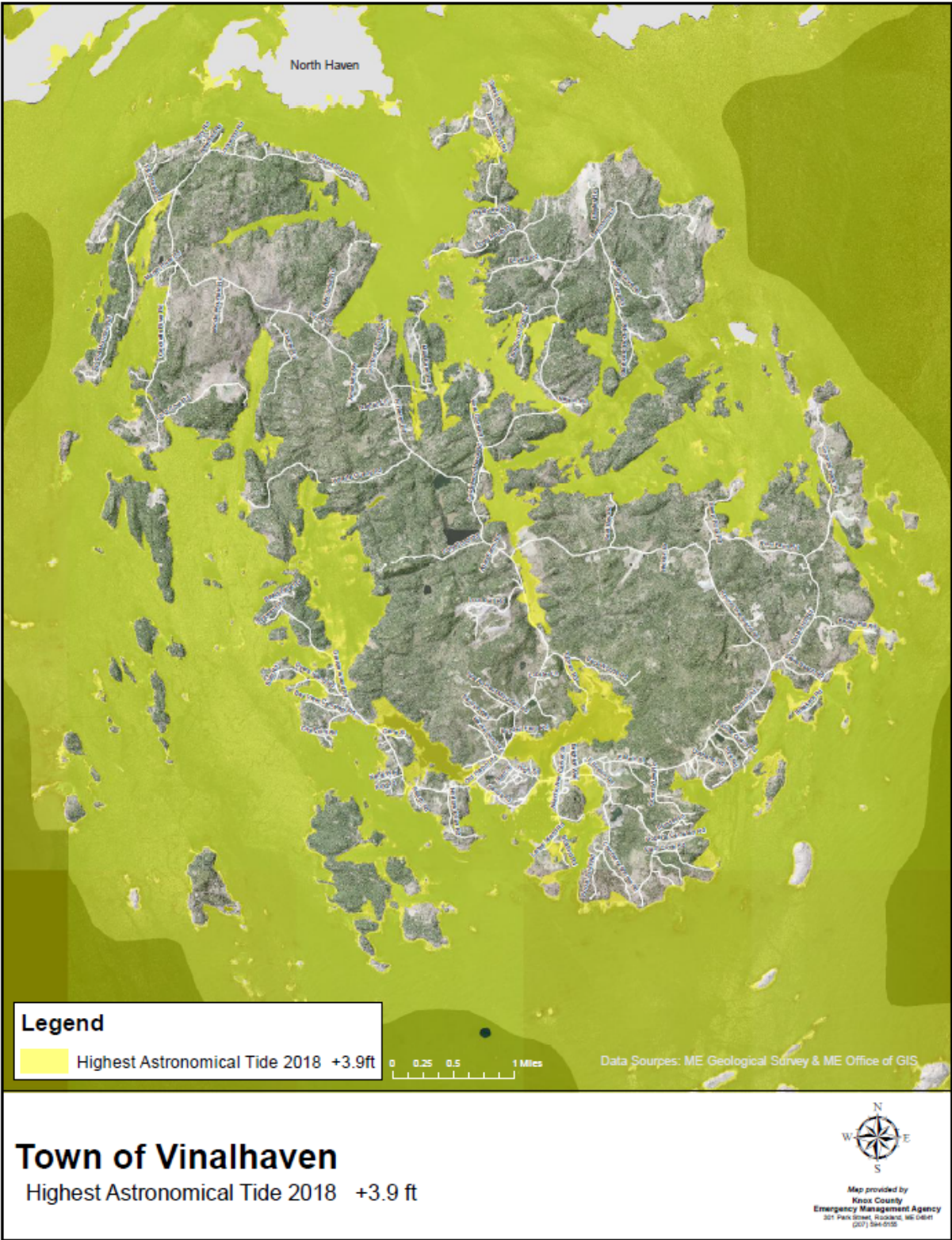


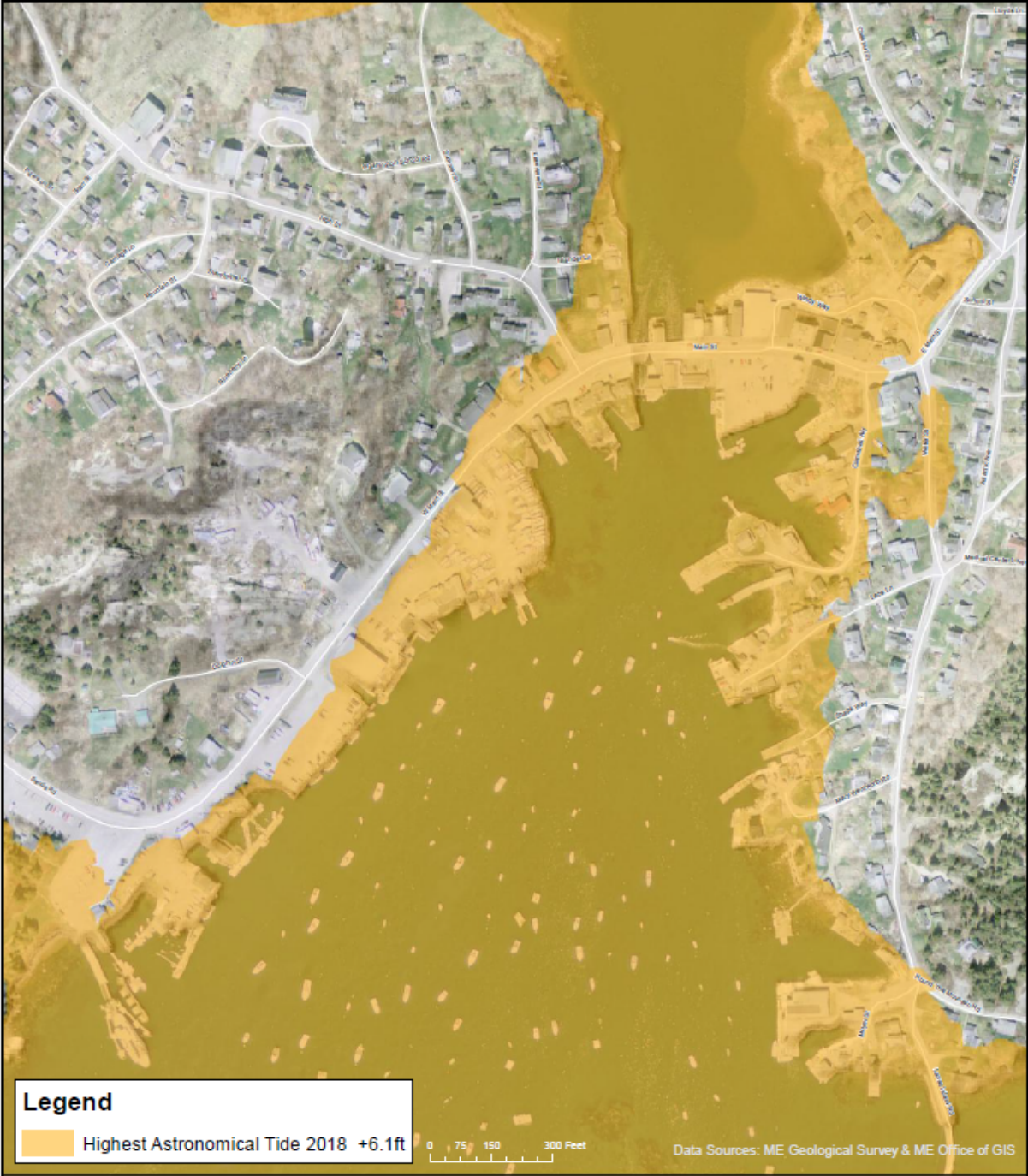




Town of Vinalhaven - Carvers Harbor
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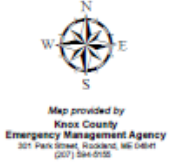


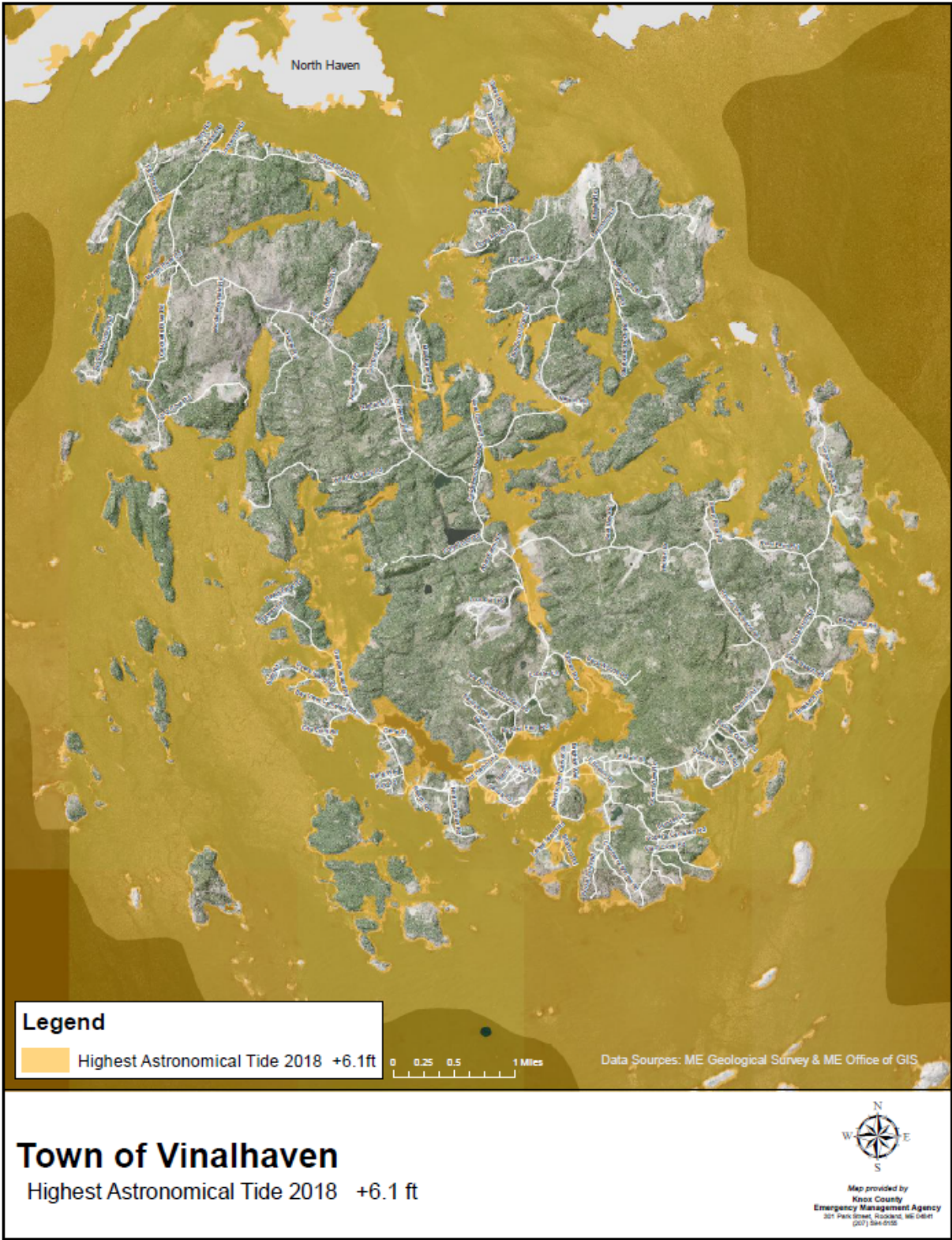


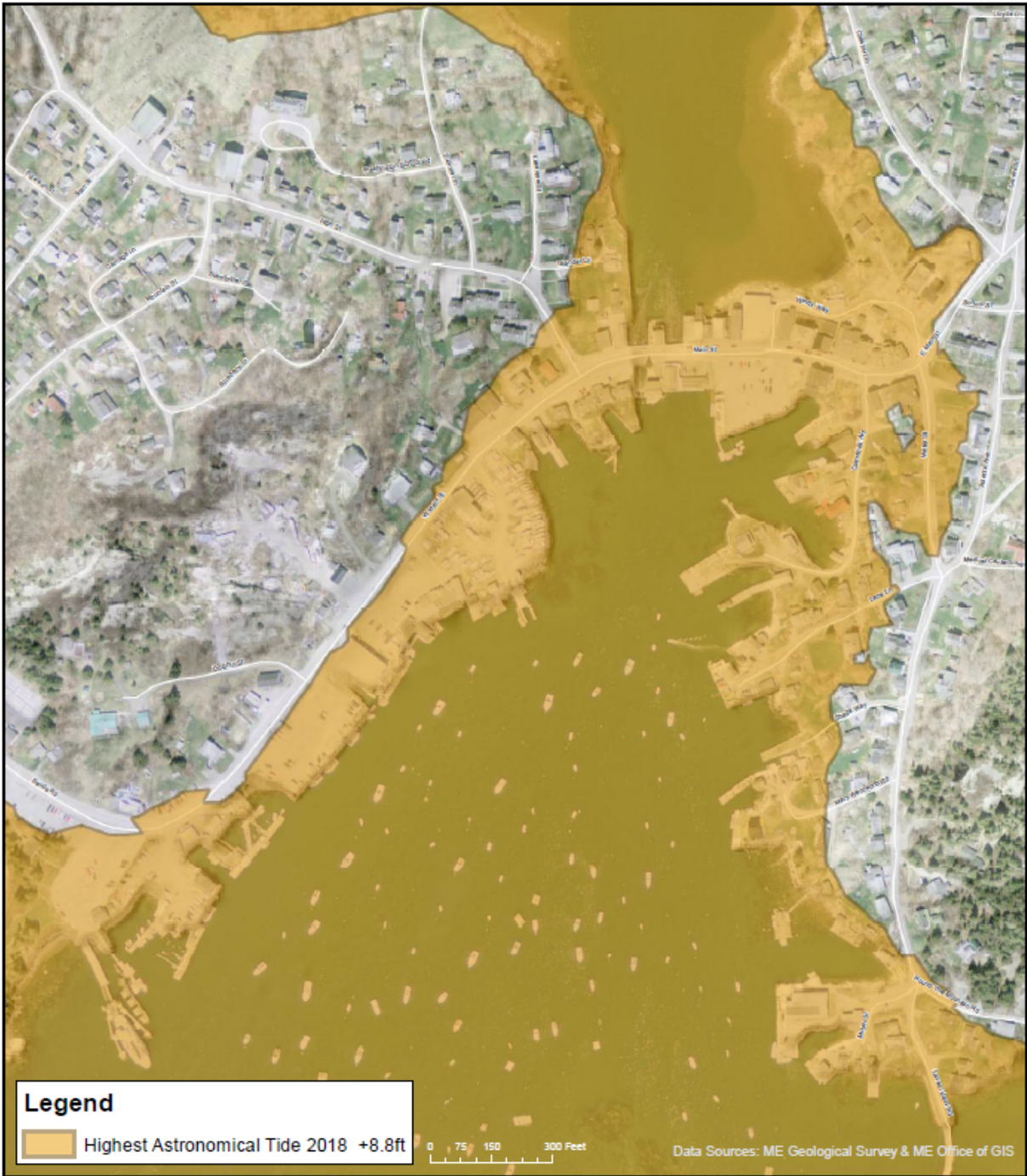


Town of Vinalhaven - Carvers Harbor

Highest Astronomical Tide 2018 +6.1 ft

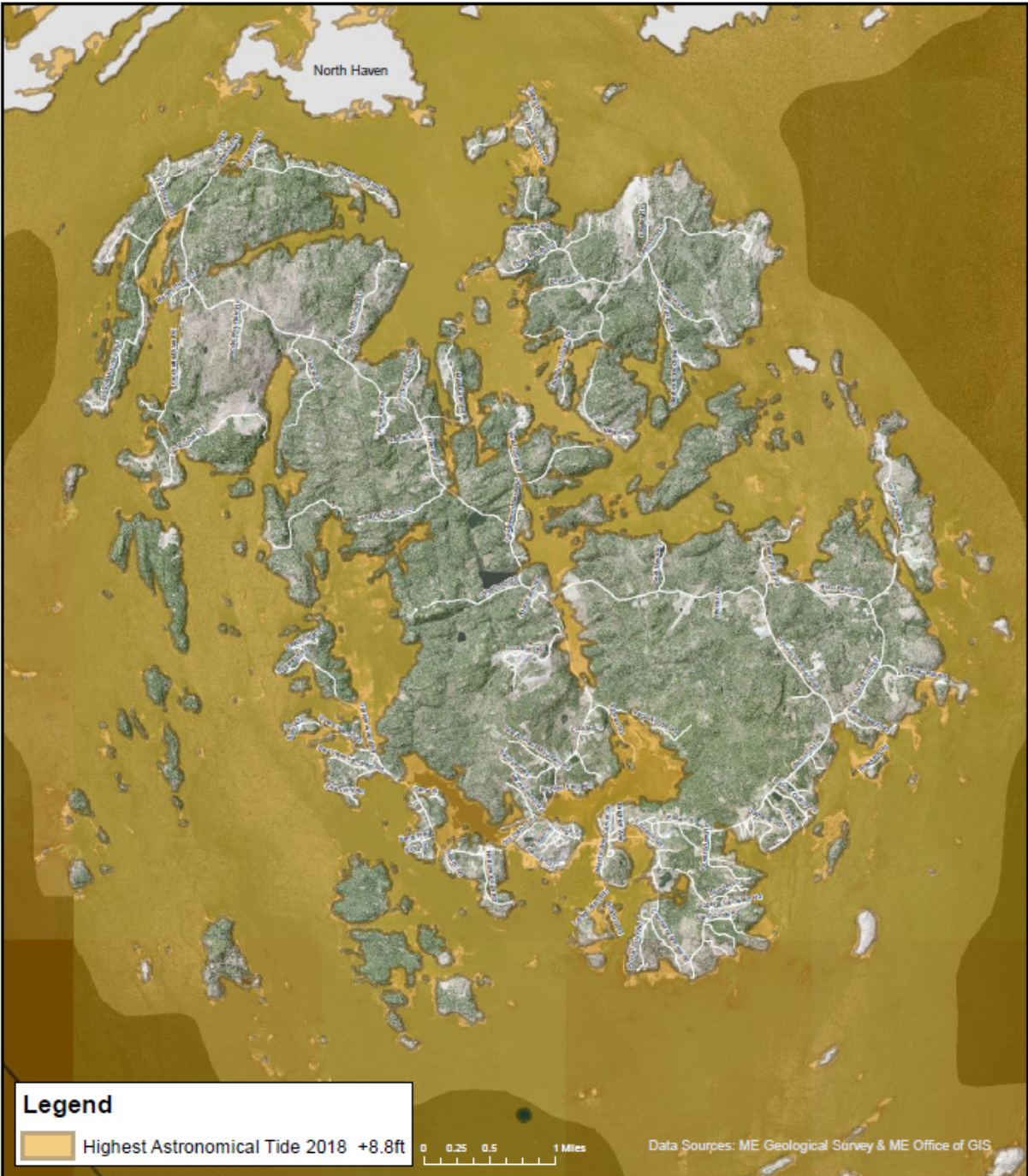






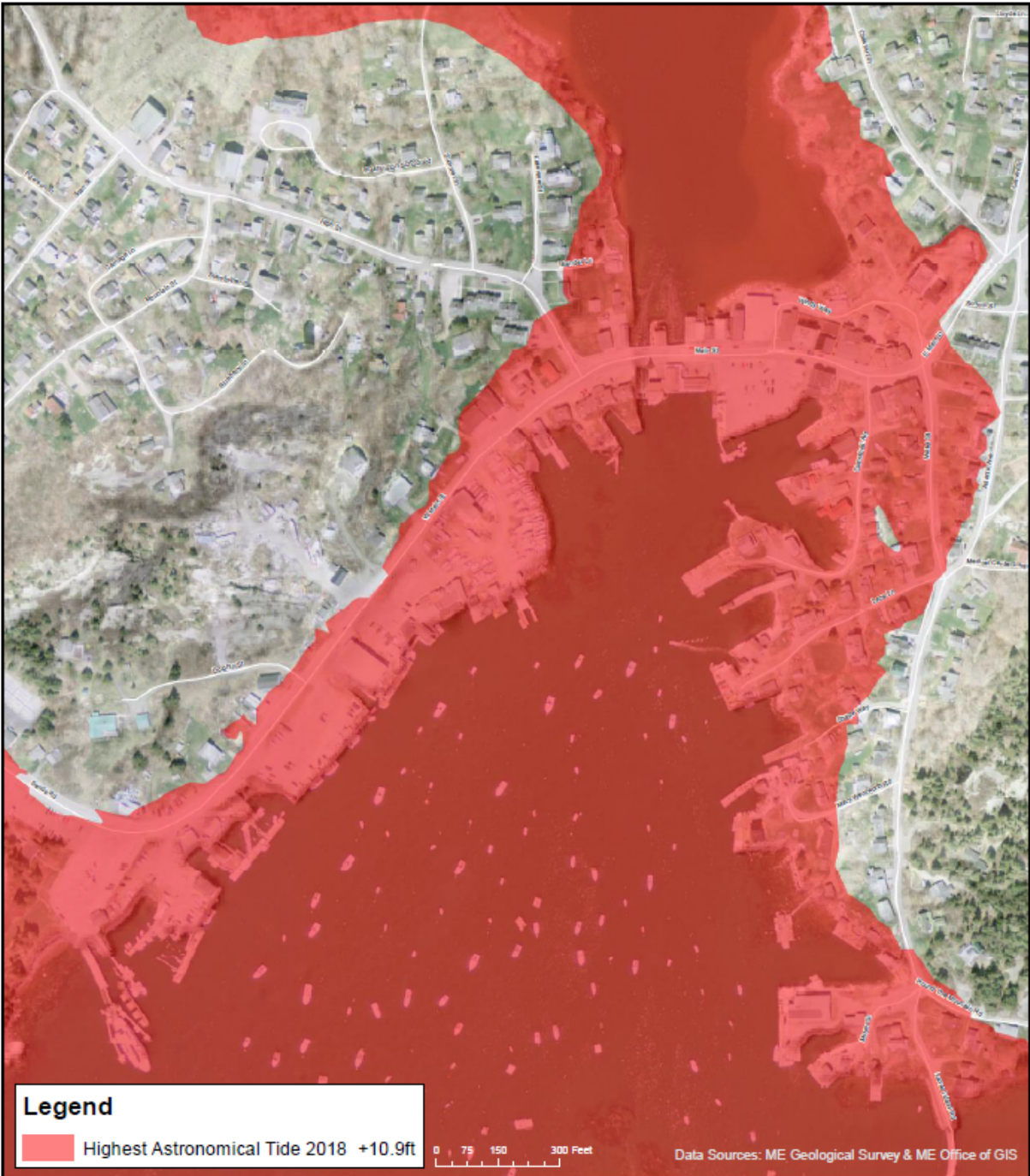
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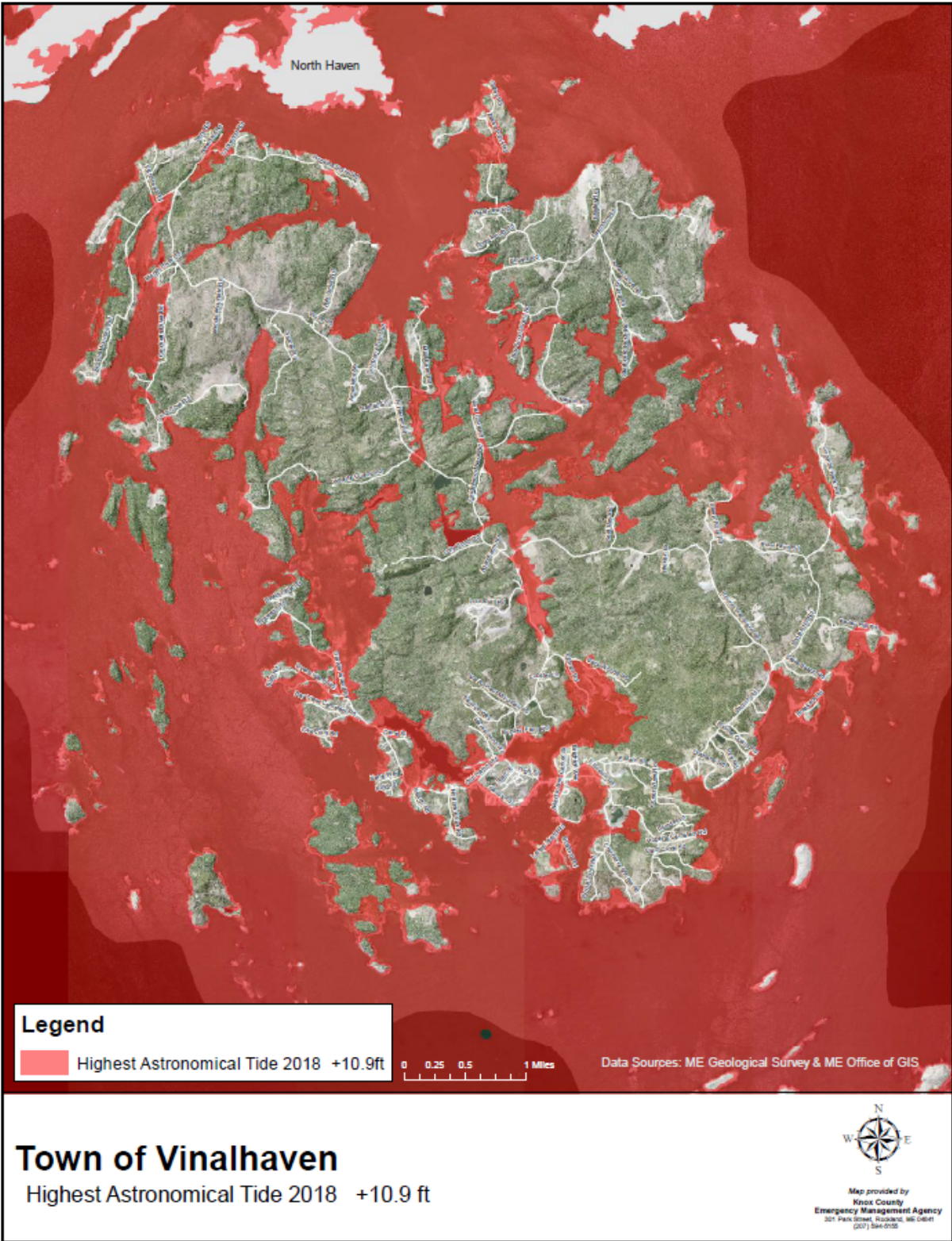
Town of Vinalhaven
Highest Astronomical Tide 2018 +8.8 ft

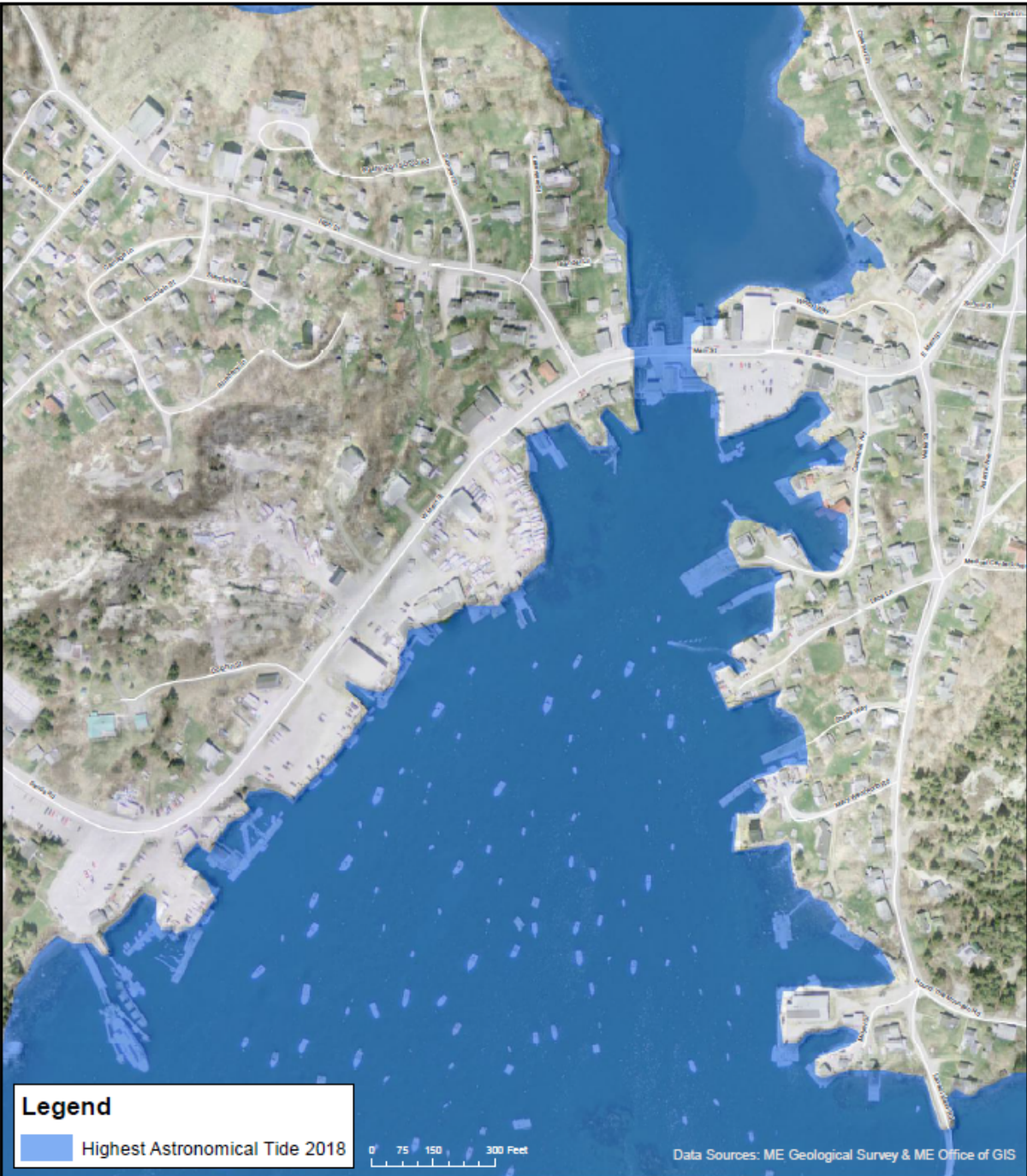
Map provided by
Knox County
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307 Park Street, Rockland, ME 05867
(207) 584-0150



Town of Vinalhaven - Carvers Harbor
Highest Astronomical Tide 2018 +10.9 ft

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307 Park Street, Hallowell, ME 04847
(207) 846-0050





Town of Vinalhaven - Carvers Harbor

Highest Astronomical Tide 2018

Map provided by
Knox County
Emergency Management Agency
301 Park Street, Houlton, ME 04731
(207) 544-0155

