



City of Annapolis Nuisance Flooding Plan



Alex Haley Memorial, April 2020



Dock Street Bar & Grill, April 2020



City Dock Parking Lot, April 2020



Compromise St, March 2018

Prepared by the Office of Emergency Management

Contributors:
Public Works
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Instructions

This Nuisance Flooding Plan (or “Plan”) is designed so that it can be either read through from beginning to end, or by using relevant sections when preparing for or responding to nuisance flooding events.

Privacy Statement

Under Maryland’s Public Information Act, certain information can be withheld from public disclosure if such disclosure would be contrary to the public interest. Md. Code Ann., General Provisions Article, §4-343.

Accordingly, the City of Annapolis (“City”) is withholding certain sections of this Plan from full public disclosure.

Statement of Nondiscrimination

During an emergency response in the City, there will be no discrimination on grounds of political or religious opinion or affiliation, race, creed, color, sex, national origin, marital status, physical or mental disability, sexual orientation, gender identity, or genetic information in the emergency management functions and City of Annapolis policy and procedures.

Disclaimer

While providing guidelines, at no time is this Plan to inhibit the use of experience and common sense by the Flooding Response Team (Office of Emergency Management, Annapolis Police Department, Public Works, and the Harbormaster’s Office) when determining the actions and resources needed to protect and serve the citizens of the City. The details described in this Plan may or may not apply to all nuisance flooding events. The Flooding Response Team must use their discretion in each situation to determine the best course of action. Procedures listed in this Plan serve as guidance but are not intended to replace the best judgment of those who are directly handling a specific response.

Office of Emergency Management Department Mission Statement

The City’s Office of Emergency Management, referred to as Office of Emergency Management (“OEM”), provides vision, direction, and subject matter expertise in order to coordinate the prevention, protection, mitigation, response, and recovery of all City hazards, and to develop an overall culture of safety.

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Background

The City of Annapolis is susceptible to a situational type of coastal flooding referred to as “nuisance” flooding anytime during the year, but generally from March to September. Nuisance flooding often occurs in the City when water levels at high tide cause public inconvenience. This type of flooding is primarily due to the City’s location as a coastal community. The lowest lying land is in the downtown Annapolis/City Dock area, Compromise St., and 2nd St. in Eastport. These areas are impacted by and located at the mouth of the Severn River, Annapolis Harbor, and Spa Creek.

The National Weather Service (NWS) may issue products (i.e. advisories/watches/warnings) in anticipation of a nuisance flooding event. The following descriptions are examples of the type of products that are applicable to this area, which could be disseminated to the public through our Prepare Me Annapolis smartphone app and/or social media.

Coastal Flooding – Flooding which occurs when water is driven onto land from an adjacent body of water.

- Coastal Flood Advisory – A Coastal Flood Advisory is issued when minor or nuisance coastal flooding is occurring or imminent.
- Coastal Flood Watch – A Coastal Flood Watch is issued when moderate to major coastal flooding is possible. Such flooding would potentially pose a serious risk to life and property.
- Coastal Flood Warning – A Coastal Flood Warning is issued when moderate to major coastal flooding is occurring or imminent. This flooding will pose a serious risk to life and property.

Some of the impacts that may result from nuisance flooding include overwhelmed storm drains, frequent road closures, and/or deterioration of infrastructure such as roads and interruption of commerce. The City as a whole is also impacted because these events weaken our landmark buildings, close our Dock Street businesses and deter our visitors by preventing access to our historic harbor.

The City is working closely with national and state partners like the National Trust for Historic Preservation, the U.S. Army Corps of Engineers, the Maryland Historical Trust, the Maryland Department of Natural Resources, the United States Naval Academy (USNA) and the Maryland Emergency Management Agency (MEMA) to address the long-term threat of climate change and rising tides.

Scientific studies report that over the past 50 years, tidal flooding has risen from an average of only four nuisance flood days per year to nearly 40. NOAA Technical Report, "Sea Level Rise and Nuisance Flood Frequency Changes around the United States" found that Annapolis has experienced a 925% increase in average annual nuisance flooding events during the past 50 years, the greatest increase recorded for any U.S. city.

Assumptions

The City is susceptible to flooding throughout the year, with higher occurrences generally happening during the Spring and Fall seasons.

Commonly nuisance flooding is attributed to the following factors:

- Sanitary sewers become infiltrated by floodwaters, causing sewers, sewage lift stations and the water reclamation facility to surge.
- Undersized roads culverts and railroad culverts as well as storm water systems can't contain flood flows.
- The capacity of flood control systems (such as drainage ponds) is exceeded.
- Wind induced coastal flooding that causes storm water drainage systems to be overwhelmed.
- The Bay floods over banks and backward through storm drains.

The anticipated source of most flooding within the City is the Chesapeake Bay, when prolonged on shore winds cause Bay waters to be driven inland along tributaries and estuaries for a sustained period of time.

Areas of the 100-year flood plain, as mapped by the Federal Emergency Management Agency (FEMA), occur along the Severn River (which borders Annapolis to the North of the City), tidal creeks, and their headwaters.

The elevation of the concrete cap of the bulkhead beneath the boardwalk is elevation 3.3 ft. NAVD 88 (4.1 ft. MLLW). At that point, the City Dock area parking lots will be flooded from Randall St. to Susan Campbell Park and the lower merchants along Dock St.

Nuisance Flooding Thresholds and Observed Impacts

As mentioned, the City routinely experiences nuisance flooding events, generally in the Spring and Fall. As a result, the City has been able to gather an inventory of areas that are typically vulnerable to nuisance flooding events, as well as determine the thresholds/water levels at which certain impacts are observed in those areas. This information can be found in the table provided below as well as the first map located in Appendix B.

The City works with the NWS to provide descriptions of the observed impacts and at what threshold levels these nuisance flooding events occur. Levels have also been set for when the City is at action (2.0 ft. MLLW), minor (2.6 ft. MLLW), and moderate (3.3 ft. MLLW) flood stage levels.

The first map, located in Appendix B, outlines the areas in downtown Annapolis that are particularly vulnerable to nuisance flooding events. This map illustrates the gradual progression of the observed impacts as the tidal elevations increase. It is important to note that these impacts are based on the City's observations of prior nuisance flooding events and the limits of flooding are subject to vary with future events. This highlights the importance of continued documentation of nuisance flooding events throughout the City to better determine a pattern of vulnerability. This map does not illustrate the nuisance flooding impacts mentioned for Eastport as they are primarily located at street end parks and do not cause road closures or require the City to respond.

‘Nuisance Flooding’ Prone Areas in Downtown Annapolis

Impacted Roads/Intersections	Tidal Height		Expected/Observed Impacts
	MLLW	NAV88	
Dock, Craig, Randall, Compromise, Newman, Memorial Circle	4.1 ft.	3.3 ft.	The parking lots on Dock St. from Randall St. to Susan Campbell Park are flooded. Water also affects several locations surrounding City Dock, including portions of Compromise Street and Memorial Circle.
Compromise, Newman, edges of Memorial Circle	3.5 ft.	2.7 ft.	Water covers Newman Park Plaza, part of Memorial Circle and reaches the floor of the Maritime Museum in Eastport.
Compromise, Newman	3.2 ft.	2.4 ft.	Intersection of Compromise and Newman streets completely covered with water.
Compromise and Newman	3 ft.	2.2 ft.	Only the center lane of Compromise Street is available for two-way vehicular traffic.
Newman Street	2.8 ft.	2.0 ft.	Water covers Newman Street from Ego Alley to Compromise St. Compromise St has water in the gutters at the edge of the roadway. Dock St. and City Dock area no longer impacted because of temporary flood mitigation system in existing storm drains. Without these measures, flooding of much of the parking area near Dock Street would be occurring.
Newman Street	2.6 ft.	1.8 ft.	Water starts to come over the bulkhead at Newman Street (street end) impacting access to adjacent properties and parking lot. Dock St. and City Dock area no longer impacted because of temporary flood mitigation system in existing storm drains. Without these measures, water would begin to pond in the parking lot at City Dock.

The City, with the support of USNA and our MIT office, is able to obtain data on all nuisance flooding events that occur in Annapolis by collecting the data from the NOAA tide gauge located on the Severn River in Annapolis. The City documents all events where the water levels reach or exceed 2.6 ft. MLLW because that is the level at which minor flood stage is reached. During the summer of 2019, temporary flood mitigation measures were installed in the existing storm drain system along Dock Street, which prevents tidal water from backing up through the storm drain system and flooding Dock St. This data over time helps to show the trend of increasing frequency at which these events occur (see Figure A). This increasing trend proves the need for continued implementation of mitigation strategies to address the observed impacts from these flooding events. The mitigation section explains the steps already taken and the impacts that are no longer observed as a result. With sea level rise a continuous threat to coastal communities, like Annapolis, it is important to continue tracking the observed impacts and develop solutions that will not only address the immediate impacts, but solutions that can alleviate the long-term impacts (i.e. repetitive losses).

Preparing For Nuisance Flooding Events

On a daily basis, the City's Office of Emergency Management (OEM) and the Harbormaster's Office (HMO) monitor the tidal forecasts provided by the NWS Advanced Hydrologic Predicts Service (Severn River tidal gauge) to ensure the City departments have situational awareness of any coastal flooding threats; the Annapolis Police Department (APD) will monitor flood activity after business hours. OEM checks to see if any nuisance flooding products have been issued by NWS and checks for the predicted tidal heights for the upcoming days. A USNA meteorologist sends OEM weather forecasts, to include coastal flooding forecasts, three days a week; USNA will provide more frequent updates if the situation warrants it. As mentioned earlier, 2.6 ft. MLLW is the level at which the City begins to track and decide what actions need to be taken.

Prior to a predicted nuisance flooding event, OEM sends out Emergency Management Alerts, which are sent to City employees and partner agencies to inform them of any upcoming incidents/events (i.e. storms, protests, power outages, etc.) that may impact their travels or cause any type of inconvenience/disruption to their daily activities. OEM uses discretion when determining if the nuisance flooding predictions warrant an alert. Some factors include the time of day (i.e. middle of the night or during peak rush hour) that peak flood levels are expected, what the expected impacts are, and if there are any special events in the area. OEM also communicates the predicted flooding events to various departments within the City to prepare them for the expected impacts so necessary preparations can be taken; additional information on the response actions taken can be found in the response section. The primary departments involved include OEM, APD, HMO and Public Works; more information on the involvement of City departments when preparing for and responding to nuisance flooding events can be found in the departmental roles and responsibilities section.

Once NWS issues nuisance flooding products, the City makes further preparations. It is important to note that not all of the actions listed below may be taken in preparation for each nuisance flooding event. The actions taken will depend on the severity of the predicted event.

- City leaders and department heads will be informed with the latest forecast, and any considerations that are appropriate regarding City services.
- Public Information may be provided regarding the NWS issued products, and protective measures that can be taken.
 - If appropriate, instruct residents/businesses to move furniture and valuables to higher floors in homes. Advise the public to remove cars from flood prone areas. As an option, City leadership may opt to opening parking garage(s) for this purpose.
- Prepare Me Annapolis Smartphone App, Annapolis Police Department Smartphone App, EM Alerts, social media, and the City website should be utilized to inform the public of potential threats.
- Critical Infrastructure should be inspected, and appropriate protection measures should be taken.
- The Action Plan for Dam 135 should be utilized as appropriate. Water levels at Dam 135 should be monitored and appropriate actions should be taken as necessary.

Mitigation Efforts Taken in Anticipation of Future Nuisance Flooding Events

Since there is a frequent occurrence of nuisance flooding events within the City, several mitigation steps have been taken to address the impacts that these events cause, and to implement long term solutions. One of the steps taken includes temporary flood mitigation measures comprised of the installation of plugs in the outfall pipes of all catch basins along Dock Street and Susan Campbell Park to prevent rising tidal water from backing up through the storm drain system. In addition, the City has installed small pumps to pump out any stormwater that collects in the catch basin since the outfall pipes are plugged. Another step has been the development of the City's Hazard Mitigation Working Group, which was created to support and bring awareness to hazard mitigation and resilience projects in and around the City, to avoid duplication of efforts, and to leverage grant opportunities; this group meets quarterly. To learn more information about this group, please contact the Office of Emergency Management at 410-216-9167.

Since 2017, the City has been developing a flood mitigation project for the necessary public infrastructure improvements to address the tidal flooding and to improve the resilience of the downtown area. This project included a planning study, conceptual design and construction cost estimates for alternative strategies. The study included regulatory review, resident and business input, economic impact assessment, and analysis of water quality effects. The overall project objective is to reduce flooding at City Dock by eliminating the backflow of tidal water through the storm drain system and onto the adjacent streets. During September 2018, the City Dock area experienced 12 days of flooding, with six of those days resulting in temporary roads closures for Compromise Street.

The project design includes the implementation of a pump station in the downtown area to help raise the threshold at which impacts occur along Compromise Street. The threshold at which impacts begin to occur along Compromise Street will be raised to 4.0 ft. MLLW. The proposed pump station:

- Disconnects storm drain system from Market Slip and prevents sea water from backing up into Newman and Compromise streets.
- Captures rain runoff and forces it out into Market Slip via pumps.
- All catch basins within affected area around City Dock will be realigned into a new collection system which will divert flow towards the pump station.
- For adjacent areas at higher elevations, drainage patterns will remain the same and discharge into Market Slip (bypass system).
 - Portions of the bypass storm drain system will be made water tight to withstand additional pressures.
- Check valves will be placed in the outfall pipes of the bypass system and pump station discharges.

To learn more information about the mitigation efforts the City has taken to address nuisance flooding, please contact the Office of Emergency Management at 410-216-9167, or Public Works at 410-263-7949.

In addition, the City's Hazard Mitigation Plan looks to mitigate the repetitive loss structures located within the City. FEMA defines a Repetitive Loss Structure as "an NFIP-insured structure that has had at least 2 paid flood losses of more than \$1,000 each in any 10-year period since 1978." (Source: <https://www.fema.gov/flood-insurance/terminology-index>). To learn more information about the City's Hazard Mitigation Plan, please contact the Office of Emergency Management at 410-216-9167.

Responding to Nuisance Flooding Events

During and following a nuisance flooding event, the City performs numerous response efforts. It is important to note that not all of the actions listed below may be taken in response to and following each nuisance flooding event. The actions taken will depend on the severity of the event.

- OEM will coordinate with City departments during a flood response to ensure appropriate actions are taken, and communicate with citizens, as well as local and state partners as necessary.
- APD will provide traffic control in areas that are unsafe for vehicle and pedestrian access and monitor flood activity after hours.
- Initial assessment and gathering information.
- Initial response can be assessed by the magnitude of the event and identifying:
 - How to protect people, the environment, and property?
 - What needs to be done and when?
- Providing the public with information regarding the ongoing situation and protective action guidance is important to protecting life and property.

- This information may include directives and warning on the continuing threat of flooding, unsafe areas, City services available and other information as appropriate.
- Emergency public information will be managed by the designated PIO.
- Evaluations for additional resources and assistance should be conducted regularly.
 - Identify specific needs and types of assistance that cannot be provided by local resources.
- Security and/or barricades should be provided to any damaged or flooded areas to prevent further injuries, damage/loss of property, vandalism, or looting.
- Initial damage assessment actions should be conducted as required. Damage Assessment Teams will be formed and deployed once it is determined to be safe to inspect neighborhoods and buildings.

The City has developed a separate alternate traffic plan that focuses on nuisance flooding response around the City Dock area. This plan for the City Dock area attempts to address the unplanned and inconvenient closures that nuisance flooding routinely causes. Before the temporary mitigation measures were installed, water would begin to pond in the parking lot at Dock Street at 2.4 ft. MLLW. That flooding threshold on Dock Street has been raised to 4.1 ft. MLLW. OEM, APD, HMO and Public Works work to maintain that traffic plan, which can be found in Appendix C. Since Compromise Street continues to flood and impact traffic to downtown, permanent advance warning flip signs have been installed along major travel corridors to downtown to divert traffic along alternate routes when Compromise Street is closed; more information regarding the operations of these signs is covered below.

In 2019, the City developed a Flooding Response Strategy Group that works to prepare for and respond to nuisance flooding events that impact the City. This group is comprised of representatives from APD, HMO, Public Works and OEM, and meets quarterly. The group is responsible for deploying the six flip signs located throughout Annapolis that alert residents and visitors that downtown road closures (i.e. Compromise Street) are in place due to flooding and that they need to utilize alternate routes to access the downtown area. The table below lists the locations of the six flip signs. A map depicting the locations of the signs can be found in Appendix B (second map) and a picture of a flip sign can be found in Figure B.

Locations of flip signs to reroute traffic heading to Downtown Annapolis
Hilltop Ln between Forest Dr and Spa Rd
Hilltop Ln near Primrose St
Bay Ridge Rd in front of Georgetown Plaza (914 Bay Ridge Rd)
Hillsmere Dr in front of the Eastport-Annapolis Neck Library (269 Hillsmere Dr)
Bay Ridge Ave in front of the SPCA (1815 Bay Ridge Ave)
Bay Ridge Ave in front of the Church of the Nazarene (1309 Bay Ridge Ave)

This group works together to document all response efforts to nuisance flooding events that result in road closures and pose a threat to public safety. The group's response flow chart is located in Appendix D and the documentation form used to track the response efforts is located in Appendix E. These two tools are what help

the City effectively respond to nuisance flooding events. These tools will not only help the City work to improve its response efforts, but will also help the City develop further mitigation steps to address future nuisance flooding events.

Departmental Roles and Responsibilities

The flooding response flow charts, located in Appendix D, list out the roles and responsibilities for OEM, HMO, APD and Public Works when responding to nuisance flooding events. This section further describes the City’s roles and responsibilities in anticipation of, during, and following a nuisance flooding event. There are primary and supporting roles that together help the City address the concerns and meet the needs of the community. Below is a table identifying the roles and responsibilities of the parties involved. It is important to note that not all of the responsibilities listed below may be taken in response to and following each nuisance flooding event. The responsibilities taken will depend on the severity of the event.

Primary Department/Office	Responsibilities
Harbormaster’s Office	<ul style="list-style-type: none"> - Monitor tidal forecasts and other tide models. Share concerns of high tides and potential coastal threats with City departments through OEM. - Secure boat lifts in full “up” position. - Provide logistical support to other departments as requested.
Public Works	<ul style="list-style-type: none"> ● Provide resources, such as barricades and variable message signs, that will divert traffic from areas of the City that are flooding. ● Provide personnel and equipment to repair damages to water and sewer facilities, restore water and sewer utilities, remove trees and large debris that requires specialized equipment from roadways. ● Identify and check serviceability of back-up generators for pumping stations; this is limited to checking serviceability of DPW’s generators. ● Provide fuel for DPW’s emergency generators. ● Provide sandbags as required and implement City sandbag program as necessary. Ensure vehicles and drivers are available for sandbag operations. ● Perform initial damage assessments of department facilities, water and sewer utilities, water/waste systems, etc. ● Monitor drinking water for contamination. ● Assist with initial damage assessments/windshield surveys as appropriate. ● With the Department of Planning and Zoning and the Harbormaster’s Office, inspect damaged facilities prior to restoring utilities. DPW’s focus will be on the underground infrastructure. ● Provide heavy equipment and operators to support City response operations.

Supporting Department/Office	Responsibilities
OEM	<ul style="list-style-type: none"> ● Send out EM Alerts, post on social media, and push on the Prepare Me Annapolis smartphone app. ● Initiate and manage the flooding response plan (Appendix D). ● If needed, coordinate with BGE to shut off electrical power to flooded structures (pulling meters).
APD	<ul style="list-style-type: none"> ● Monitor and manage vehicle traffic in the City. ● Provide security for any damaged or flooded areas to prevent further injuries and loss of property.
ADOT	<ul style="list-style-type: none"> ● Continue City bus route in locations if possible and communicate re-routing or closed portions of a route to OEM.
MIT	<ul style="list-style-type: none"> ● Provide inundation and flooding map support and other GIS support as appropriate.
PIO	<ul style="list-style-type: none"> ● Release information to the public regarding road closures via media outlets (i.e. social media and City Mobile Applications).

Plan Maintenance

OEM is responsible for maintaining the contents of this Plan by ensuring that its contents are current and accurate. Each department playing an integral role in flooding preparedness and response is expected to develop SOPs/SOGs that address their respective assigned tasks. The City knows that the involvement of local leaders and decision makers will help to ensure the successful adaptation of this Plan that aims to identify long-term risk reduction strategies to address nuisance flooding impacts. This Plan will be reviewed by the departments and agencies listed above on a yearly basis; any updates or changes will be submitted to OEM.

Accompanying Plans

This Plan mentions several other City plans and groups that have components related to preparing for, responding to and mitigating against nuisance flooding. Within the City’s Emergency Operations Plan (EOP) is a Flooding Incident and Hazard Specific Annex, which focuses on the various types of flooding that Annapolis is particularly vulnerable to; this includes nuisance flooding. To learn more about the plans and groups listed below, please contact the Office of Emergency Management at 410-216-9167.

- Action Plan for Dam 135
- Dock Street Traffic Plan
- Emergency Operations Plan
- Flood Mitigation Projects
- Flooding Response Strategy Group/Flooding Response Plan
- City of Annapolis Hazard Mitigation Plan
- Hazard Mitigation Working Group

Appendix A: Acronyms

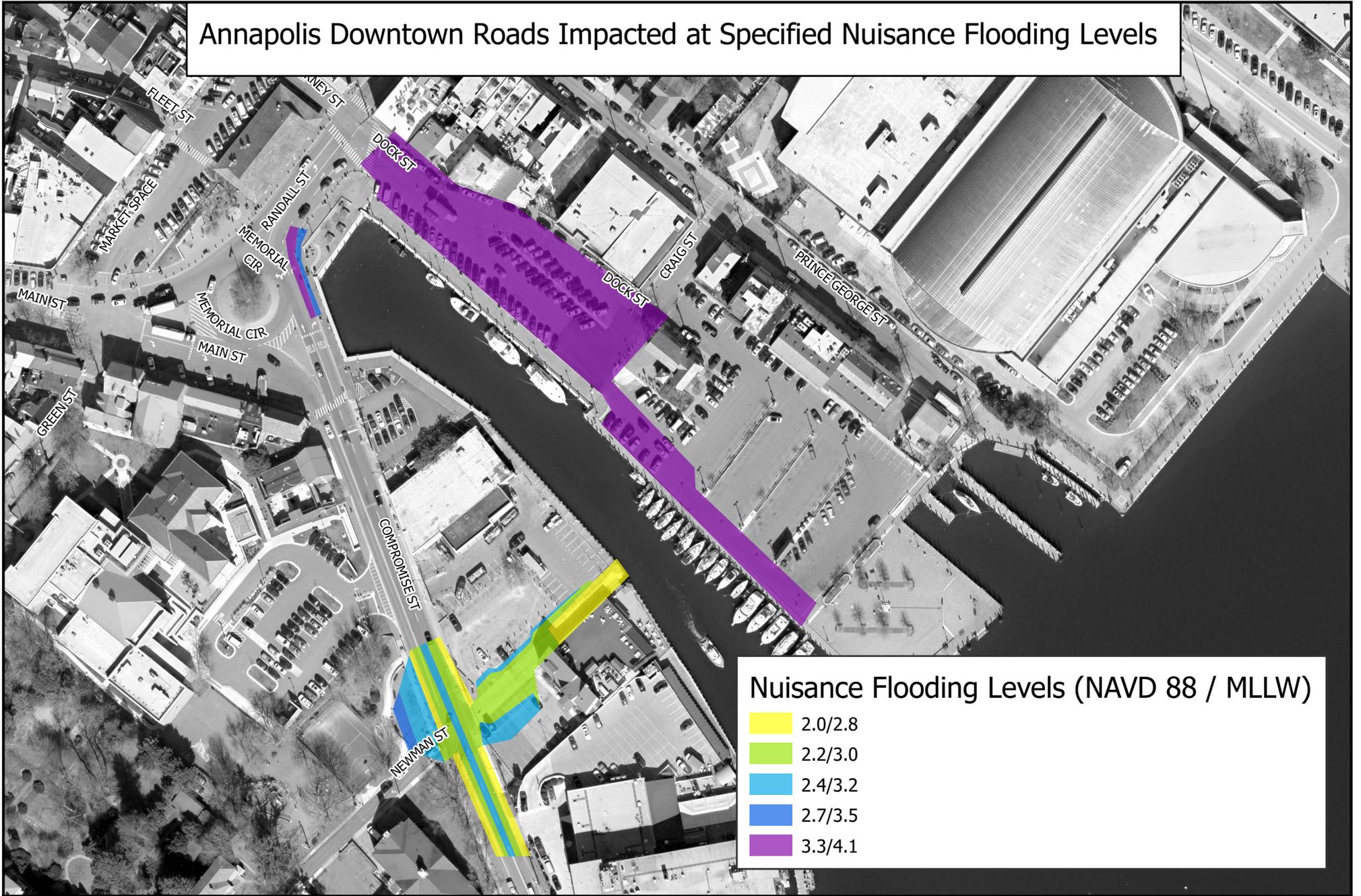
List of Acronyms

AACo – Anne Arundel County
ADOT – Annapolis Department of Transportation
AFD – Annapolis Fire Department
APD – Annapolis Police Department
DNR – Department of Natural Resources
DoAD – Department of Aging and Disabilities
DOH – Department of Health
DSS – Department of Social Services
EOC – Emergency Operations Center
EOP – Emergency Operations Plan
HMO – Harbormaster's Office
JIC – Joint Information Center
MDE – Maryland Department of the Environment
MEMA – Maryland Emergency Management Agency
MEMAC – Maryland Emergency Management Assistance Compact
MIT – Management Information Technology
NWS – National Weather Service
OEM – Office of Emergency Management
PIO – Public Information Officer
SOG – Standard Operating Guidelines
SOP – Standard Operating Procedures
USNA – United States Naval Academy
WebEOC - The original web-enabled crisis information management system and provides secure real-time information sharing to help managers make decisions quickly.

Appendix B:

Maps

Annapolis Downtown Roads Impacted at Specified Nuisance Flooding Levels



Nuisance Flooding Levels (NAVD 88 / MLLW)

- 2.0/2.8
- 2.2/3.0
- 2.4/3.2
- 2.7/3.5
- 3.3/4.1



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 US Feet
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Locations of Flip Signs to Reroute Traffic Heading to Downtown Annapolis

Legend

 Flip Signs

**Road Closure
and Downtown**



	<p>0 37.575 150 225 300  US Feet City of Annapolis MIT GIS</p>	<p>Map Created By: MIT GIS</p>	<p>Department Use:</p>
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Appendix C: Dock Street Traffic Plan

Dock Street Alternate Traffic Plan



For more information regarding this traffic plan, please contact the Office of Emergency Management at 410-216-9167.

Appendix D: Nuisance Flooding Response Actions

Business Hours*

*varies by department

Measurable water levels that may restrict parking and/or road access

Flooding **ONLY** at City Dock

Flooding at City Dock and Compromise

Business Hours

PW Services (6 AM to 1:30 PM M-F)
PW Engineering and Construction (8:30 - 4:30 PM M-F)
APD (24/7/365)
OEM (24/7/365)

Harbormaster Seasonal Business Hours:
January-March: Open Monday-Saturday 8 AM - 4 PM
April: Open 7 days a week 7 AM - 6 PM
May-October: Open 7 days a week 7 AM - 9 PM
November: Open 7 days a week 7 AM - 5 PM
December: Open Monday-Saturday 8 AM - 4 PM

APD or Harbormaster's Office will notify appropriate departments:
OEM (410-216-9167)
PW (410-263-7967)
Harbormaster's Office will deploy cones and barriers as needed; HMO will put out "High Water" and/or "Open for Business" signs and then notify OEM. APD and PW will assist as requested.
APD will assist with traffic control and provide updates on the app and social media pages as needed.

APD and OEM will coordinate with the appropriate departments and send out additional notifications as needed.

When the flooding event is over, APD or HMO will return all signs and put barricades away as directed. APD and OEM will send out updated push notifications and social media posts.

APD will close Compromise St and/or Dock St if necessary. APD or Harbormaster's Office will notify appropriate departments:
PIO: (410-972-7724)
OEM (410-216-9167)
PW (410-263-7967)
APD will post on their Police app.

APD and OEM will coordinate with the appropriate departments and send out notifications as needed. APD and OEM will continue to coordinate and monitor water levels and road conditions and send out the appropriate notifications.

Public Works will deploy cones, barriers and flip signs as needed. PW will coordinate with APD, OEM and HMO to determine further action. If flood levels of 2.9 ft. MLLW or higher are forecasted to occur after 1:30 PM during weekdays, PW must be notified **prior to 12 PM** (or prior to **12 PM Friday** if flooding is forecasted to occur over the weekend) so they can stage and program the VMS sign at Chesapeake Ave. & Burnside St.

When the flooding event is over, APD and OEM will send out push notifications on their respective apps. APD will notify PW (410-263-7967) that the flips signs can be tied back up again, and all cones and barricades can be recovered.

Outside Business Hours*

*varies by department

Measurable water levels that may restrict parking and/or road access

Flooding **ONLY** at City Dock

Flooding at City Dock and Compromise

APD will monitor water levels/road conditions and notify appropriate departments if flooding will impact the commute:
OEM (410-216-9167)
APD will deploy cones and barriers as needed; APD will put out "High Water" and/or "Open for Business" signs.

APD and OEM will coordinate with the appropriate departments and send out notifications as needed. APD will assist with traffic control and provide updates on the app and social media pages as needed. OEM will also send out updated push notifications and social media posts.

When the flooding event is over, APD will return all signs and put barricades away as directed. APD and OEM will send out push notifications and social media posts notifying residents that the water levels have receded, if necessary.

Business Hours

PW Services (6 AM to 1:30 PM M-F)
PW Engineering and Construction (8:30 - 4:30 PM M-F)
APD (24/7/365)
OEM (24/7/365)

Harbormaster Seasonal Business Hours:

January-March: Open Monday-Saturday 8 AM - 4 PM
April: Open 7 days a week 7 AM - 6 PM
May-October: Open 7 days a week 7 AM - 9 PM
November: Open 7 days a week 7 AM - 5 PM
December: Open Monday-Saturday 8 AM - 4 PM

APD & OEM send out notifications on social media and push on the app.

If flood levels of 2.9 ft. MLLW or higher are forecasted to occur after 1:30 PM during weekdays, PW must be notified **prior to 12 PM** (or **prior to 12 PM Friday** if flooding is forecasted to occur over the weekend) so they can stage and program the VMS sign at Chesapeake Ave. & Burnside St.

If needed, APD will flip the signs (cut the zip ties), activate VMS sign and turn towards oncoming traffic and deploy cones and barricades where needed. The APD road supervisor will notify the PW after hours number **(410-224-2140)** once the signs are flipped.

APD will continue to monitor traffic and water levels. Notifications will be sent out by APD and OEM when appropriate.

Once flooding has receded, signs can be tied back up. APD road supervisor will notify the PW after hours number **(410-224-2140)** that the VMS signs, cones and barricades can be recovered. APD road supervisor will then notify PW that the flip signs can be tied back up.

Appendix E: Nuisance Flooding Documentation Form

Nuisance Flooding Documentation

The purpose of this form is to track all nuisance flood events within the City and our accompanying response efforts.

* Required

Name *

Your answer

Date *

Date

mm/dd/yyyy 

Time *

Time

__ : __ AM ▼

Peak Flood Level (specify whether MLLW or NAV88) *

Your answer

Time Peak Flood Levels Reached *

Time

__ : __ AM ▼

Road Closures Caused by Flooding and Duration of Closures *

Your answer

Notifications Sent to Departments/Public about Flooding and Potential Closures *

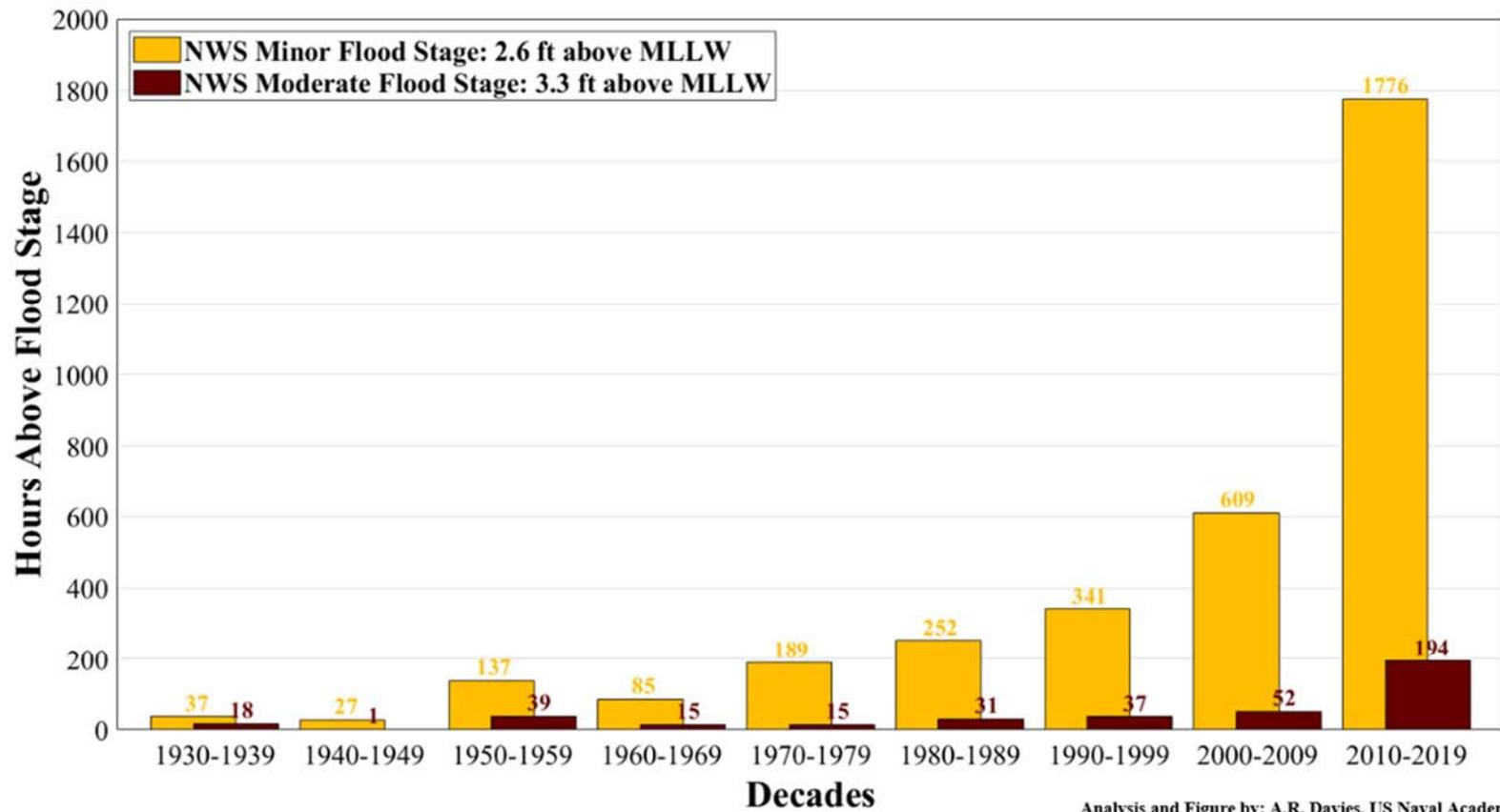
Your answer

Response Actions Taken *

Your answer

Submit

Figure A: Nuisance Flooding Frequency Graphs



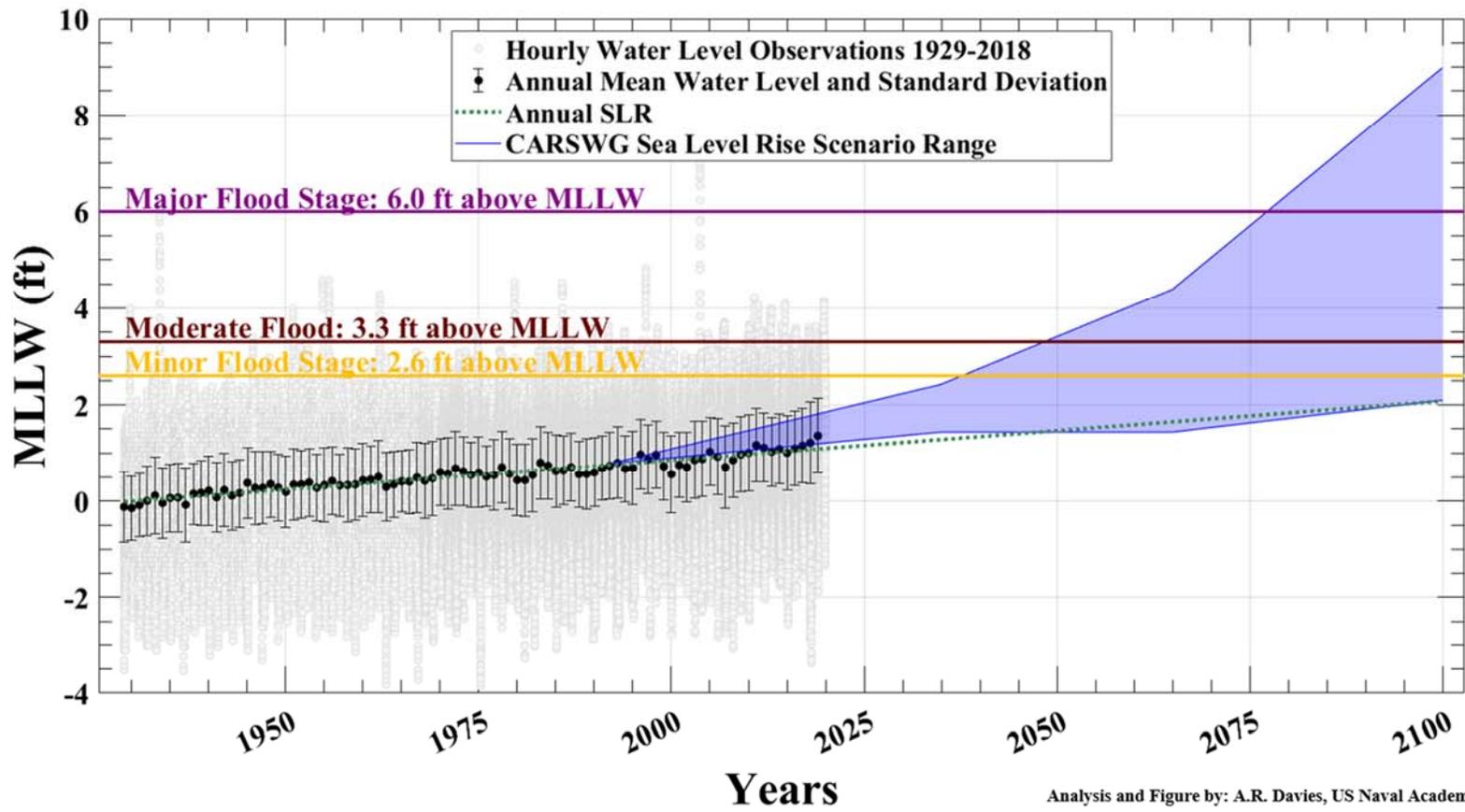


Figure B: Nuisance Flooding Flip Signs

The following image is of the flip signs located throughout Annapolis to alert residents and visitors of downtown road closures.

