



Health Impact Assessment (HIA) of Proposed Code Changes Regarding Onsite Sewage Disposal Systems in Suffolk County, NY

Samantha Shattuck

Pegasus Technical Services, Inc.

Contractor to U.S. Environmental Protection Agency

*The views expressed in this presentation are those of the author and do not necessarily
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Presenter Disclosures

Samantha Shattuck

The following personal financial relationships with commercial interests relevant to this presentation existed during the past 12 months:

No Disclosures



WHAT IS HEALTH IMPACT ASSESSMENT (HIA)?

HIA is a systematic process that uses an array of data sources and analytic methods and considers input from stakeholders to determine the potential effects of a proposed policy, plan, program, or project on health of a population and the distribution of those effects within the population. HIA provides recommendations on monitoring and managing those effects.

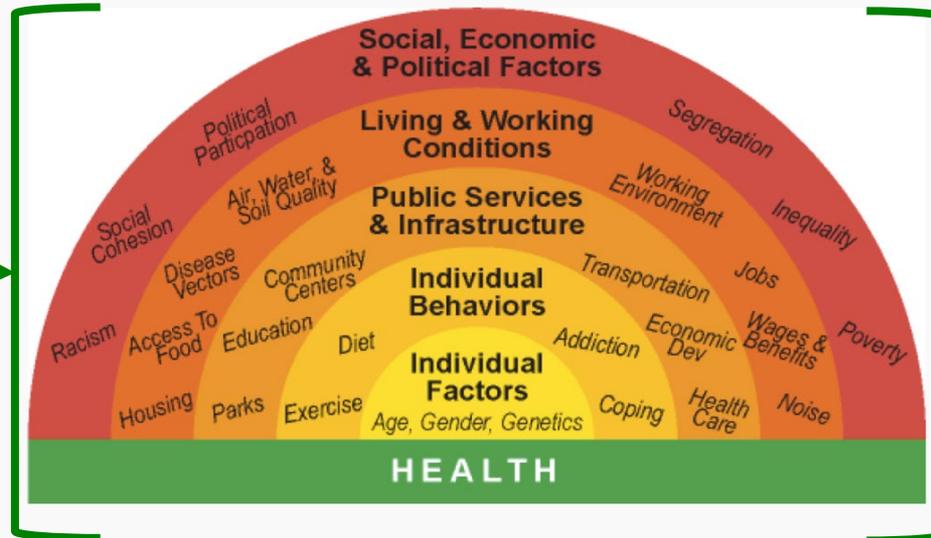
- National Research Council. 2011. *Improving Health in the United States: The Role of Health Impact Assessment.*



Health Impact Assessment (HIA)

Evaluate how the proposed project, plan, policy, program...

...affect...



...and provide recommendations for...

...that lead to health outcomes...



Steps of HIA



Screening, to determine whether a proposal is likely to have health effects and whether the HIA will provide useful information



Scoping, to establish the scope of health effects that will be included in the HIA, the populations affected, the sources of data and the methods to be used



Assessment, which is a two step process that first describes the baseline health status and then assesses potential impacts



Steps of HIA



Recommendations suggest design alternatives that could be implemented to improve health or action that could be taken to manage health effects



Reporting presents findings and recommendations to decision makers and stakeholders



Monitoring and evaluation includes monitoring the implementation of HIA recommendations. Evaluation can be of process, impact or outcomes



ABOUT THE HIA IN SUFFOLK COUNTY

Why was an HIA performed?

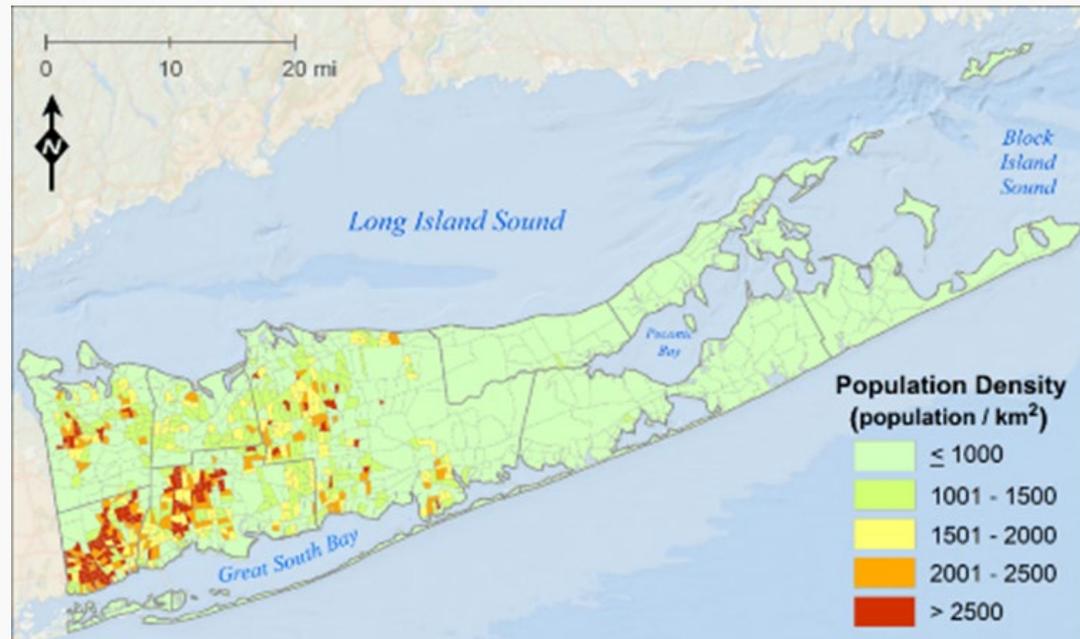
Who performed the HIA?

What was the scope of the HIA?

What methods were used in the HIA?

Why was an HIA performed?

- As part of Hurricane Sandy recovery efforts, Suffolk County agreed to host an HIA, led by EPA, that would help the County reach resiliency and sustainability goals
- Suffolk County is the eastern region of Long Island, the second largest county in New York, and as of the U.S. Census in 2010, home to over 1.4 million people



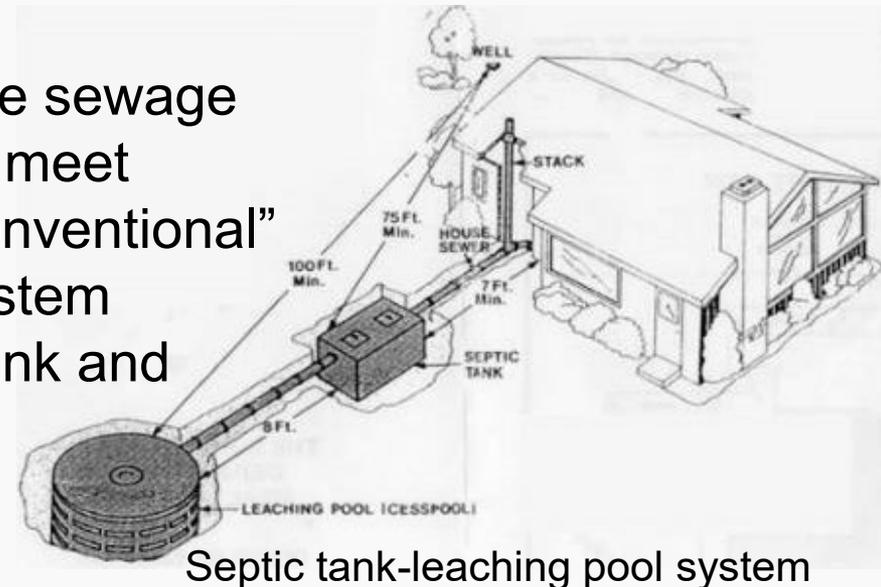
Why was an HIA performed?

- Suffolk County Department of Health Services (SCDHS) proposed code changes to the Suffolk County Sanitary Code as one of many strategies for addressing nitrogen pollution in Suffolk's waterways
 - Require upgrading existing onsite sewage disposal systems (cesspools) to meet current county standards – a “conventional” on-site wastewater treatment system (OWTS) consisting of a septic tank and leaching pool)

Nitrogen

“public water enemy number one”

- Suffolk County Executive, Steve Bellone



Septic tank-leaching pool system



Why was an HIA performed?

- Suffolk County estimated approximately 74% of residences utilize individual sewerage systems
- Of those approximately 386,000 residences, about 193,000 were built prior to 1973 (when the current sanitary code went into effect) and are assumed to be served by cesspools alone* (i.e., no septic tank)
 - Current sanitary code allows failed cesspools and conventional systems to be replaced in-kind (i.e., cesspools not required to be upgraded to meet current standards)

* Approximations updated in 2019 to reflect the more recent estimated number of residences based on HIA analysis.



Why was an HIA performed?

- It was agreed that the proposed decision could benefit from an HIA:
 - Individual sewerage systems (cesspools or septic tank-leaching pool systems) are the primary mode of sewage disposal for residences in Suffolk County
 - There are human health and environmental consequences of high-density and/or malfunctioning individual sewerage systems – namely, cumulative loading of nutrients and pathogens to groundwater
 - Groundwater is the main source of public drinking water in Suffolk County and has a major influence on recreational waters and waters of economic importance



Who performed the HIA?

- Staff in EPA's Office of Research and Development (ORD) and Region 2 partnered to lead the HIA; funding for travel was provided by the FEMA Sandy Recovery Office
- An HIA Project Team was established that conducted the HIA with input and guidance from an HIA Technical Advisory Committee
 - **HIA Project Team** - EPA staff, contractors, research fellows, and local professional stakeholders who served on the HIA Leadership Team and/or HIA Research Team
 - **HIA Technical Advisory Committee (TAC)** - technical experts and representatives from several stakeholder groups and community residents and stakeholders with local knowledge and expertise

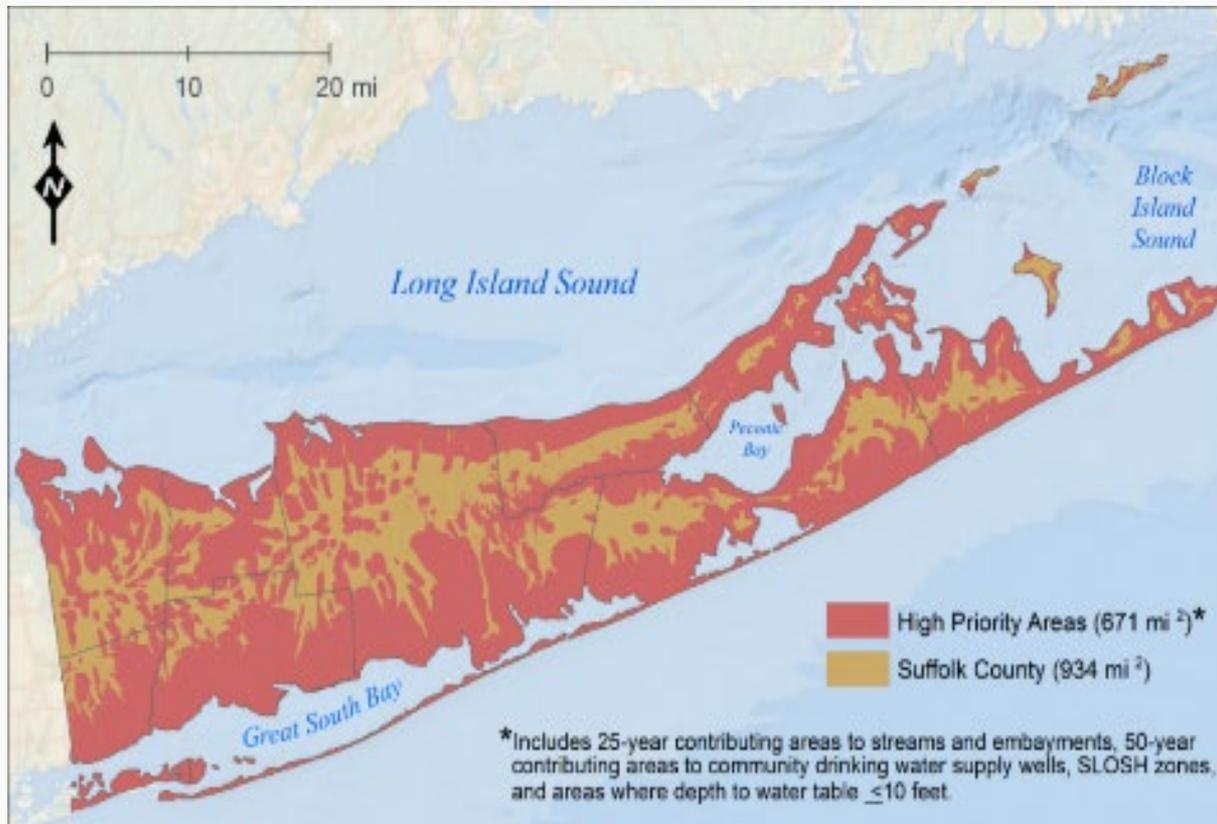


What was the scope of the HIA?

Baseline	Alternative I	Alternative II	Alternative III
Existing conditions	All new AND existing individual (onsite) sewage disposal systems (OSDS) serving single-family residences must conform to current County Sanitary Code and standards [Cesspools must be upgraded to “conventional” (septic tank-leaching pool) system]	All new AND existing OSDS serving single-family residences in high priority areas must conform to current County Sanitary Code and standards [Cesspools in high priority areas must be upgraded to “conventional” (septic tank-leaching pool) systems]	All new AND existing individual sewerage systems (either cesspool-only systems or conventional OWTS) serving single-family residences in high priority areas must be upgraded to County-approved innovative/alternative (I/A) OWTS [All systems in high priority areas must be upgraded to innovative/alternative systems]



What was the scope of the HIA?

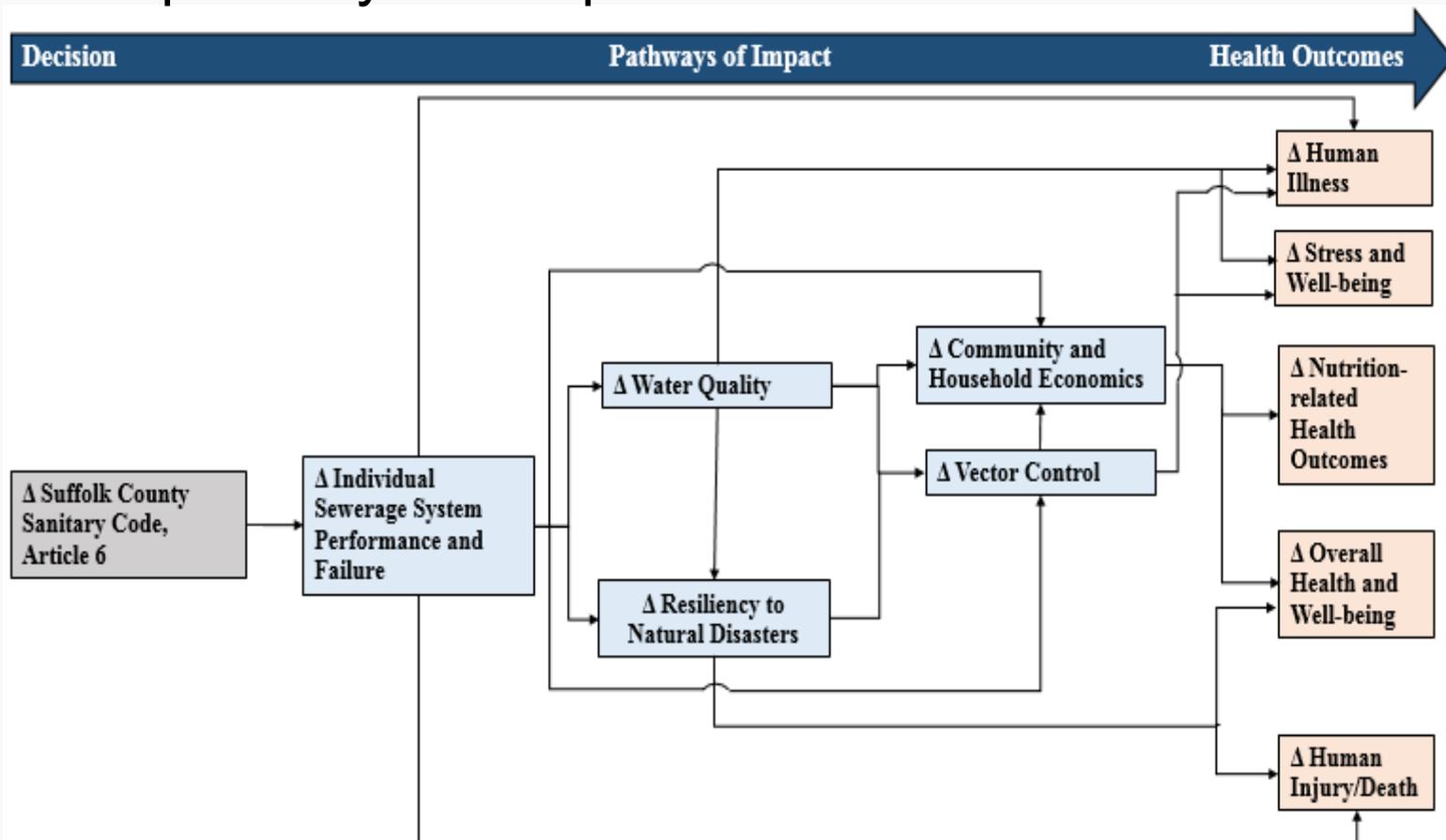


High priority areas

Areas in the 0-50 year groundwater contributing zone to public drinking water wells fields; areas in the 0-25 year groundwater contributing zone to surface waters, areas located in SLOSH zones (Sea, Lake, and Overland Surges from Hurricanes); and areas located where groundwater is less than 10 feet below grade

What was the scope of the HIA?

- Five pathways were prioritized for assessment





What methods were used in the HIA?

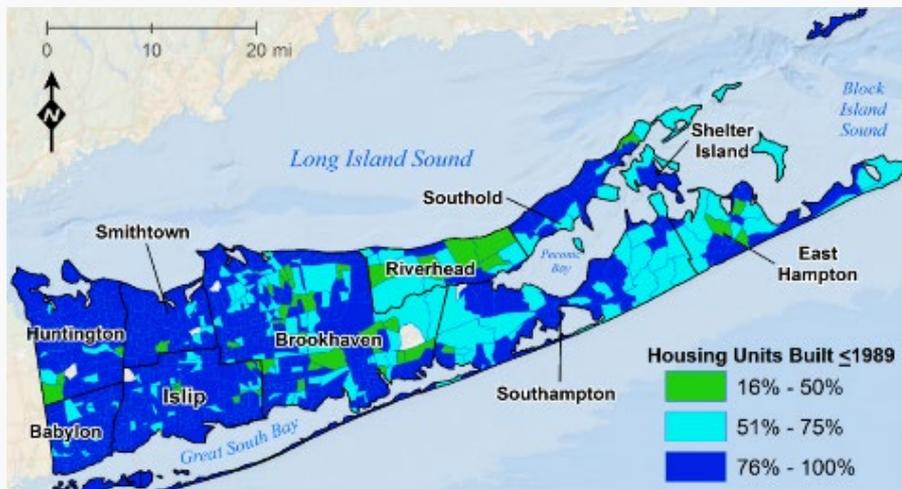
- A **mixed methods approach** was used to assess the current conditions, how those conditions might be impacted, the connection to health, and how health might be impacted by each alternative
 - ✓ Pre-existing, publically-available data
 - ✓ Geographic information systems (GIS)
 - ✓ Social study design
 - ✓ Statistical and graphical analysis
 - ✓ Systematic literature review
 - ✓ Expertise from local public health professionals, researchers, and other stakeholders
 - ✓ Measureable (quantitative) and relative (qualitative) characterization of impacts



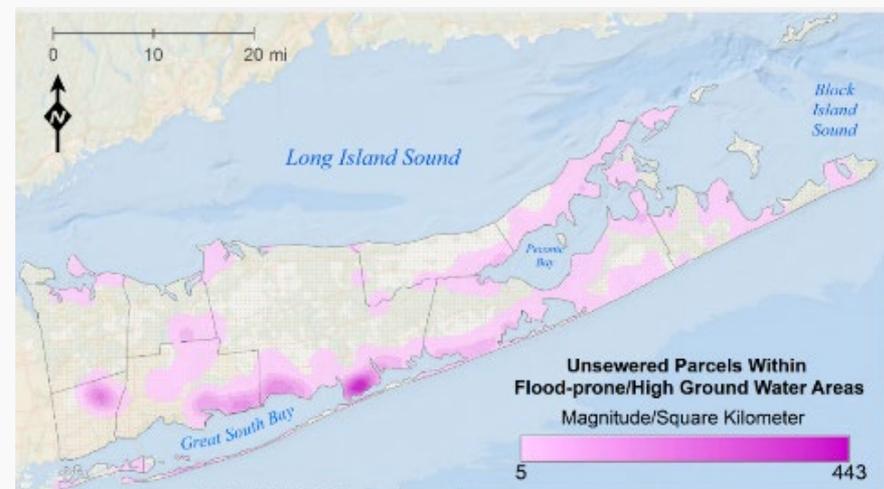
MAJOR HIA FINDINGS AND RECOMMENDATIONS

Major Findings

- Many systems in Suffolk County are **at the end of their useful life and/or located in flood-prone or high ground water areas** (groundwater ≤ 10 feet from surface) and **prone to structural failure and/or hydraulic failure**



Systems reaching the end of their useful life (25+ years old)



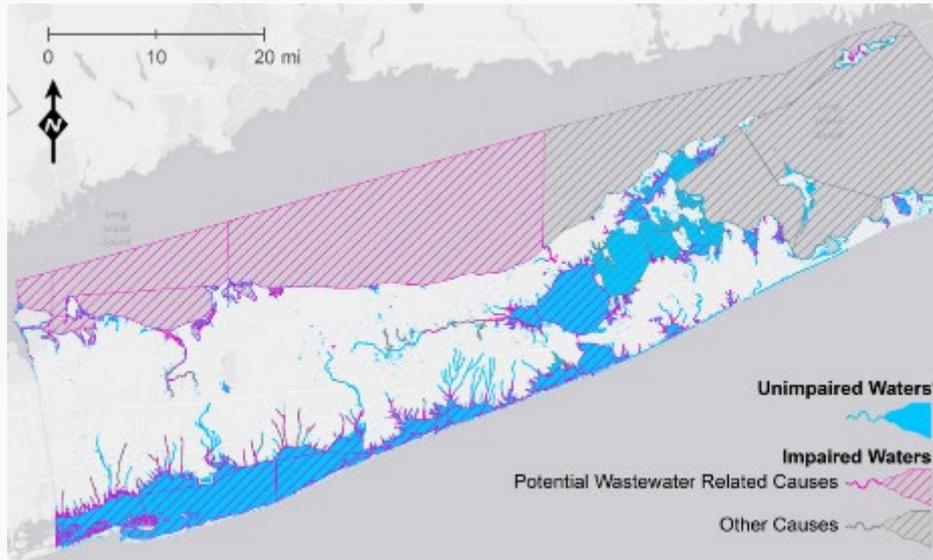
Systems located in flood-prone or high ground water areas



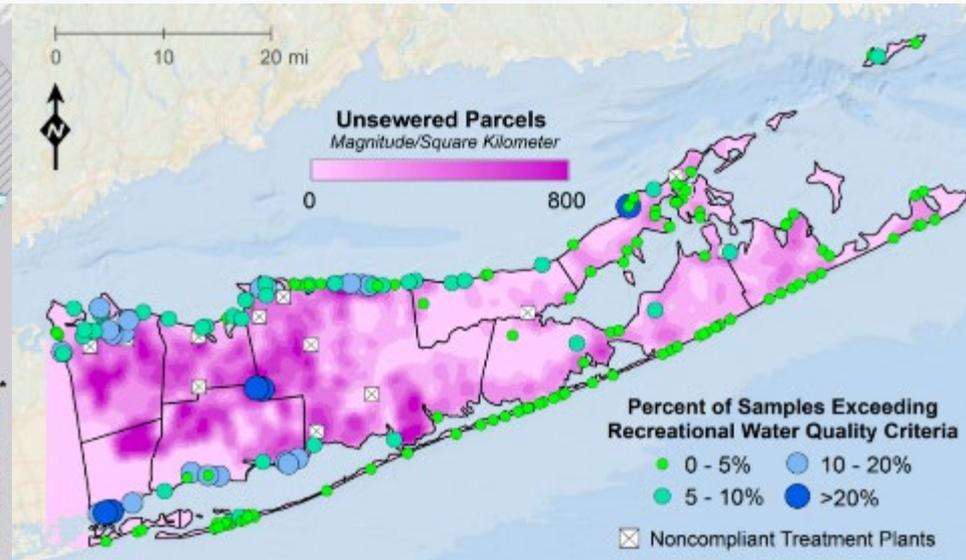
Major Findings

- **Wastewater effluent** (from individual sewerage systems and sewage treatment plants) has been shown to be a **major source of nitrogen loading to groundwater**
- In Suffolk County, **groundwater is the main source of public drinking water**, and due to the high water table and soil composition, can also have a **major influence on surface, recreational, and, ultimately, coastal waters**
- The quality of all water resources is **essential to public health**, the **economy**, and the **desirability** of living in Suffolk County

Major Findings



Impaired Suffolk County Waters



Percent of Samples Exceeding Recreational Water Quality Criteria



Major Findings

- Impacts of nitrogen and pathogen loading to Suffolk County waters: **algal blooms**, beach closures, **waterborne illness**, contamination and/or loss of fish and shellfish, breeding grounds for mosquitoes, **coastal wetland loss**, decline of stabilizing vegetation and eelgrass, **declines in home values**, and **economic losses** from tourism, aquaculture, and recreation industries revenue and employment



Major Findings

- ***Alternatives I and II*** would result in **no change in total nitrogen (TN) loading** and **limited reduction in pathogen loading**
 - Nitrogen levels in septic tank effluent are equivalent to levels in untreated wastewater and the “conventional” OWTS in Suffolk County (septic tank-leaching pool) is not the same as the conventional OWTS in the scientific literature, which utilizes a soil absorption field to further purify or treat the septic tank effluent
- ***Alternative III (I/A OWTS)*** is the only alternative that would provide **considerable improvement** in the control of nutrients (nitrogen) and possibly pathogens



Major Findings

- If the I/A OWTS achieve Suffolk County's goal of 19 mg/L TN in effluent, then ***Alternative III*** would result in a **cumulative reduction in TN loading** from individual sewerage systems of **2.52 million kg TN per year (5.56 million pounds TN per year)**
- Although implementation of Alternative III could reduce nitrogen loading and potentially result in new employment opportunities, there are **considerable costs to residents** associated with individual sewerage system upgrades
 - These costs can reduce the amount of expendable household income available for nutrition and essential health-related goods and services



Major Findings

- Although Alternative III may reduce nitrogen loading, **that *does not mean improved community resiliency to natural disasters***, because...
 - Wastewater inputs are not the only source of nitrogen loading to Suffolk County waters and nitrogen loading is only one of many factors affecting loss of coastal/tidal wetlands and eelgrass across the County
 - Even if wetland and eelgrass habitat is restored, shoreline resiliency to storm and/or tidal surges in Suffolk County is expected to be jeopardized unless something is done to offset the **rapid acceleration of sea level rise** projected for the region



Major Findings

- Although Alternative III may reduce nitrogen loading, ***that does not mean improved community resiliency to natural disasters***, because...
 - As sea levels rise, Suffolk County will see **greater extent and frequency of coastal flooding from storms**
 - With the **dense development** of Suffolk County's coasts, a **great number of people, property, and infrastructure are in harm's way** of natural disasters, and the population of Suffolk County is projected to continue to increase



Major Recommendations

- General recommendation: A **fourth alternative should be considered**, requiring upgrade of individual sewerage systems to an innovative/alternative technology across the entire county, with prioritization given to parcels in the high priority areas
- Other recommendations were offered regarding:
 - Planning and Implementation of the Proposed Code Changes
 - Outreach and Communication
 - I/A OWTS Evaluation
 - System Siting, Design, and Installation
 - System Maintenance
 - Cost Control and Funding Measures
 - Employment and Hiring
 - Protection of Water Resources



HIA Process and Impact Evaluation

- **Process Evaluation** – Design and implementation of the HIA were assessed
 - Were the **goals of the HIA achieved?** **Yes**
 - ✓ Develop a comprehensive HIA that addresses stakeholder concerns
 - ✓ Raise awareness of HIA as a decision-support tool
 - ✓ Bring evidence-based information to help inform Suffolk County's decision on proposed code changes regarding OSDS
 - ✓ Provide a neutral and inclusive platform for stakeholders to discuss the needs and issues in Suffolk County founded on a common objective to advocate for health and wellness, and enhance stakeholder consensus and ownership of the decisions made
 - Identified **successes, challenges, and lessons learned**
 - HIA Report underwent an external peer review by subject matter experts



HIA Process and Impact Evaluation

- **Impact Evaluation** – Impact of the HIA on the decision, decision-making process, and/or decision-making climate was assessed
 - Were the proposed code changes implemented as originally outlined or were there changes made? If changes were made, what were the changes and why were they made?
 - Did Suffolk County adopt and implement the recommendations of the HIA? If not, was there rationale provided for why the recommendation(s) were not adopted?



HIA Process and Impact Evaluation

- **Impact Evaluation**

- A decision has not yet been made, but since presenting the draft HIA findings and recommendations in Fall 2016, the County has undertaken a number of efforts:
 - Began revising the alternatives under consideration to include requirements for replacements and retrofits of existing cesspools and requirements to use I/A OWTS in certain cases
 - Undertook considerable nutrient loading and groundwater modeling efforts that will result in nitrogen load reduction goals upon which wastewater treatment alternatives will be based
 - Undertook additional testing and approval of I/A OWTS
 - Established a grant program to help fund the cost of upgrades
 - And more!



Questions?

Presenter:

Samantha Shattuck, *shattuck.samantha@epa.gov*

HIA Leadership Team:

Shannon Griffin, EPA ORD, *griffin.shannon@epa.gov*

Grace Musumeci, EPA Region 2, *musumeci.grace@epa.gov*

Rabi Kieber, EPA Region 2, *kieber.rabi@epa.gov*

Justicia Rhodus, Pegasus Technical Services,
rhodus.justicia@epa.gov

thank you!