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RECURRENT FLOODING, SEA LEVEL RISE, AND THE RELOCATION OF AT-RISK COMMUNITIES: CASE STUDIES FROM THE COMMONWEALTH OF VIRGINIA

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DEFINING RELOCATION

- Resilience to Relocation
- Relocating in Place
- Relocating Nearby
- Relocating at a Distance
Methods employed by a community or locality to stave off more dramatic relocation phases. Resilience strategies can include both “soft” and “hard” infrastructure.

Examples: nature-based solutions, living shorelines, regenerating and preserving wetlands, digging retention basins, dredge disposal projects, installing floodgates, or building sea walls.

“Hard” infrastructure like sea walls, floodgates, and jetties are often extremely expensive and often take years of planning and construction before they can be implemented.
BACKGROUND CONSIDERATIONS

- Dillon Rule
  - Localities can only take action where the Virginia Assembly has enabled them to do so.

- Property Rights
  - Rights given to the person or persons who have a right to own the property through purchase or bequest
    - Absolute right for a property is rare in any society
  - Government takings
    - What is just compensation?

- National Flood Insurance Program (NFIP)
  - Encourage communities to adopt and enforce floodplain management regulations
RESILIENCE TO RELOCATION CASE STUDY: TANGIER

TANGIER
HOW MUCH ARE WE ABLE AND WILLING TO SPEND DEFENDING IT?

- Population: 722; strong history and culture
- Median Household Income: $38,056
- Lost 2/3 of landmass since 1850; high-range sea level rise predictions show town may need to be abandoned in 25 years
- Seawall already extends one mile along western shore to protect airport
- USACE planning to build a jetty on northwestern side to preserve the navigation channel. Originally proposed 1990s. Estimated to begin 2018 if funding is secured.
- As of 2016, NFIP 78 policies on island (11 low-risk, not required)
  - 1982-2011, 87 total flood insurance claims, averaging $10,705/claim
A POPLAR ISLAND-LIKE SOLUTION?

- Poplar Island, MD. Dredged material from Baltimore Harbor deposited to rebuild Poplar
  - Estimated cost: $1.4 Billion ($800,000/acre).
- USACE dredges Tangier’s channels every five years.
- Project must be economically justified.
  - Other environmental impacts to be considered
RELOCATING IN PLACE CASE STUDY: POQUOSON

- Small suburban city in Hampton Roads; About 4,770 housing units
- Population: 12,017; median household income: $83,735
- About 600 homes have been elevated (~15%)
  - Nearly every home within a mile of waterfront marshes
  - Generally: older homes raised on brick or cinder block, new homes built one story off ground with garage underneath
- Filled in higher ground and rebuilt elementary school, fire station, sewer pump stations
- Plans to elevate one of the main roads into city by 10 feet (estimated cost: $60 million)
FUNDING FOR ELEVATING HOMES

- 200 homes elevated using funds through NFIP Increased Cost of Compliance (ICC) coverage after Hurricane Isabel flooding in 2003
  - ICC provides up to $30,000 to help cover cost of mitigation measures that will reduce flood risk
- Four grants from Community Development Block Grants and Hazard Mitigation Grant Program to elevate 70 homes from 2004-07
- City Manager’s Office: “acquisition of flood-prone properties is not considered a viable alternative.”
POQUOSON AND NFIP

- **3,266 NFIP policies by February 2014**
  - 84% of insured were inside the 100-year flood plain

- **971 Repetitive Loss Properties ($34 million)**
  - At least two paid flood losses more than $1,000 each in 10-year period Estimates 274 have been mitigated/elevated

- **35 Severe Repetitive Loss Properties ($3 million)**
  - Four or more claims payments of $5,000 and cumulatively more than $20,000
RELOCATING NEARBY CASE STUDY: NORFOLK
NORFOLK

- Population: 246,393
- One business owner says every time it floods it costs him $5,000 to $10,000
- Federal government has proposed $1.8 billion to help protect Norfolk by installing floodwalls, storm surge barriers, and tidal gates
Some estimates think waters around Norfolk will have risen anywhere from 11 inches to 3.3 feet if no steps are taken.

- Exacerbated by land subsidence
- Long-term strategy to address the challenges of sea level rise
- Breaks city down into areas (Red, Yellow, Green, and Citywide)
  - Gives specific goals for each area based on the risk each region is in
- Some of it has taken effect, such as the Norfolk 2020
  - Plan to buy up land and redevelop it
NORFOLK AND NFIP

- Norfolk is broken down into 7 zones
  - Range from 0.2% annual chance of flooding to areas affected by waves heights between 1.5 and 3 feet
- 4 of these zones require flood insurance
- A member of the Community Rating System (CRS)
  - Voluntary incentive program that “recognizes and encourages community floodplain management activities that exceed minimum NFIP requirements”
  - One of 25 Virginia communities with this recognition
- Class 8 CRS participate
  - Average of $66 in savings on annual premiums (total of $791,754 annual savings)
RELOCATING AT A DISTANCE CASE STUDIES

- Broadwater (VA)
- Shishmaref and Newton (AK)
- Isle de Jean Charles (LA)
- Sidney (NY)
Once a popular hunting and fishing island

Used to be at least 20 houses on the island, none remain today

Attempted other forms of relocation before abandoning
  - Raised houses; floated houses on barges to higher grounds
NEWTOK AND SHISHMAREF

- Faces up to 70 feet of land erosion per year
  - Expected to lose their source of drinking water this year
- Town of 450 wants to move to a location nine miles away
- Several villages have already constructed new houses
- Army Corps of Engineers estimates $80 to $130 million to relocate key infrastructure for each town
- Attempting to piece together a quilt of state and federal funding
- Asked for a disaster area declaration from the president, which would unlock necessary funding
  - FEMA has no policies in place for relocation
ISLE DE JEAN CHARLES

- Small community in South Louisiana
- Since 1955, the island has lost 98% of its land
- First community to receive federal tax dollars to help move an entire community relocating due to climate change
  - Received $48 million from HUD
  - These federal funds have to be spent by 2022
- Choosing a location has been very difficult, potential receiving communities impose problems
- Also a concern of a lack of community
  - Want to reunite the more than 200 families that have scattered after leaving the island
SIDNEY

- 2011 flooding has impacted over 2,000 people
- Sidney began with plans to move the town to dry-land
  - As of now, has yet to remove more than a few dozen homes from the flood plain
- U.S. is “politically, financially, and emotionally” unprepared to recreate communities in a way that is organized and preserves the character and history
  - Things take time
WHAT CAN WE LEARN FROM ALL THESE CASE STUDIES?

- So many contributing factors come into play
  - Funding, receiving communities, property rights, etc.
- Planning ahead is a good thing
- Putting plans in place for procedures to deal with this can help speed up the process
- Funding is vital

- [https://law.wm.edu/academics/programs/jd/electives/clinics/vacoastal/reports/index.php](https://law.wm.edu/academics/programs/jd/electives/clinics/vacoastal/reports/index.php)