



Sheila Dixon
Mayor

Floodplains 21st Century – Connecting with the Public and Future Challenges



Douglas
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**Flooding from
Hurricane Isabel**

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Overview

- Flooding History
- Floodplain Management
- Baltimore's Map Update Process
- Sea Level Rise




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NATIONAL FLOOD INSURANCE PROGRAM

FIRM
FLOOD INSURANCE RATE MAP

CITY OF
BALTIMORE,
MARYLAND
INDEPENDENT CITY


PANEL 11 OF 17
(SEE MAP INDEX FOR PANELS NOT PRINTED)



PANEL LOCATION

COMMUNITY-PANEL NUMBER
240087 0011 D

MAP REVISED:
SEPTEMBER 30, 1988



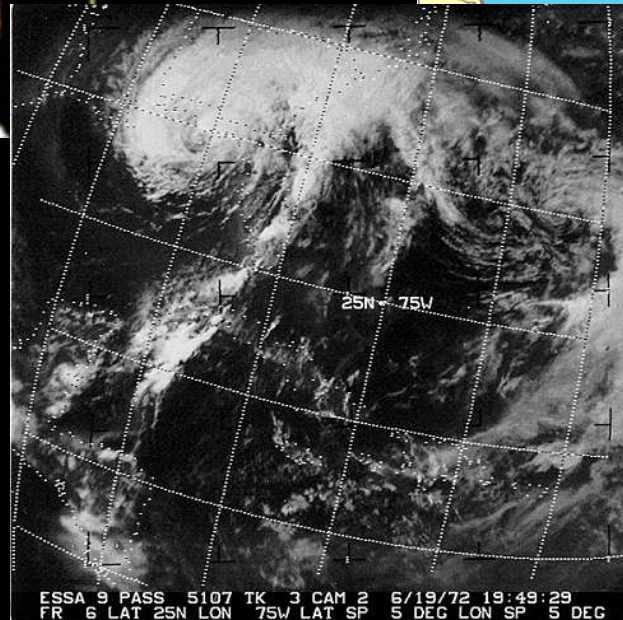
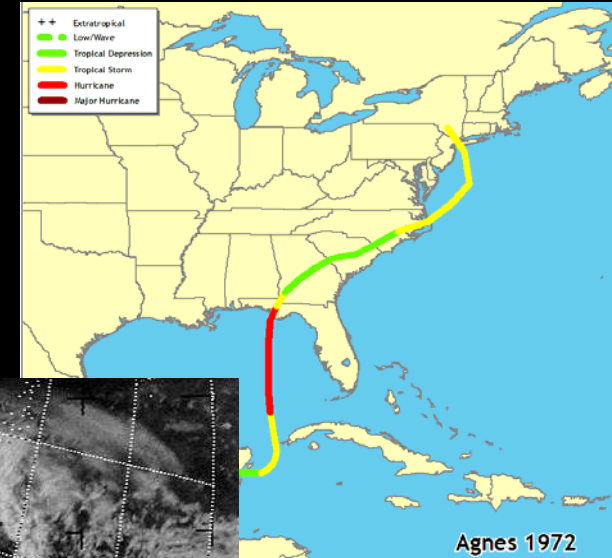
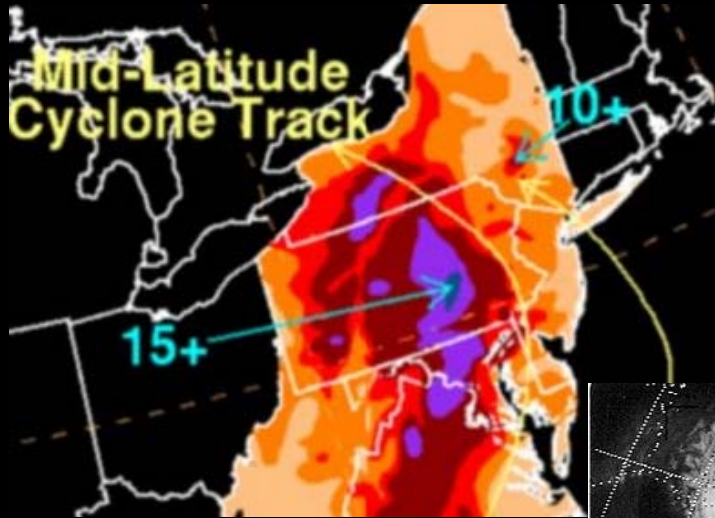
Federal Emergency Management Agency



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Agnes - Rainfall



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Agnes - Rainfall



June 22, 1972

Floodwaters in Ellicott City.

File photo by George H. Cook



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Agnes - Rainfall



June 22, 1972

The bridge on the Patapsco Avenue extension, which connects Caton Avenue and Potee Street, became a raging river after more than seven inches of rain fell during Tropical Storm Agnes.

File photo by Frank R. Gardina



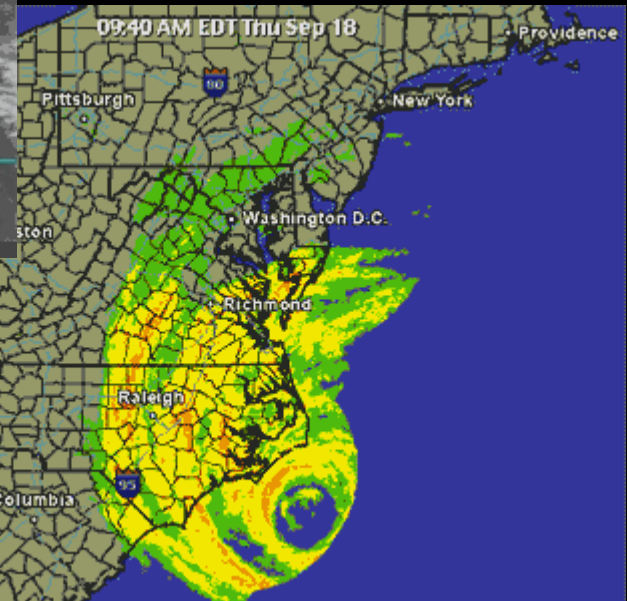
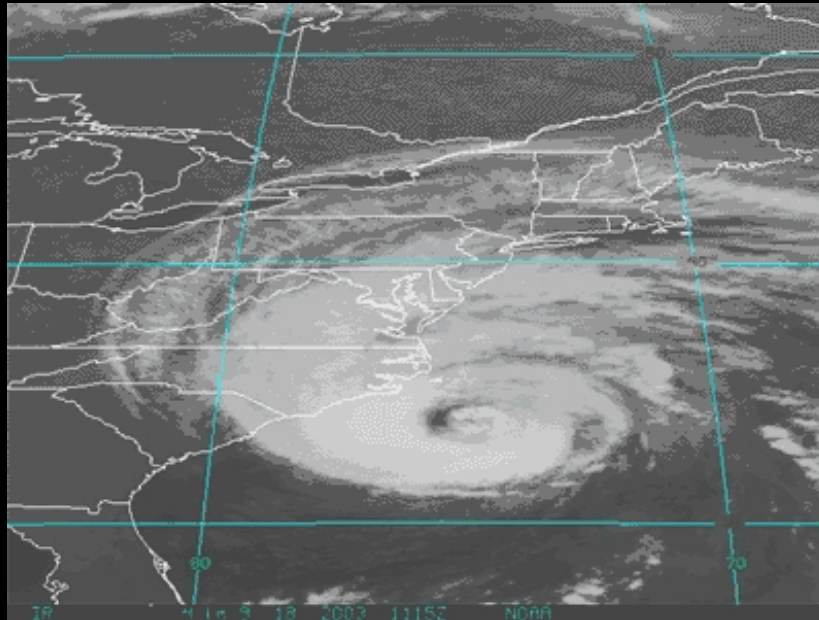
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Isabel – Tidal Surge



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Federal National Flood Insurance Program

- The NFIP is a federal program established in 1968
- Amended in 1973 and 1994
- Enabled property owners, in Participating Communities, to purchase flood insurance. 1974 – Required flood insurance on all Federally backed loans
- Participating Communities are those communities that adopt and enforce floodplain management regulations that meet or exceed federal requirements



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Baltimore joined NFIP in 1974 with initial flood hazard mapping

- Responsibilities of NFIP communities
 - *Adopt Floodplain Management Ordinance*
 - *Regulate Development in SFHA*
 - *Overall floodplain management*
 - *Record Keeping (Community Assistance Visits)*
 - *Hazard Mitigation Plan Updates*
 - *Maintain and update maps*



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FEMA Map Modernization

- Aggressive 5-year initiative to update the Nation's flood hazard maps
- Reduce reliance on paper products
- Encourage the use of quality local data to make administration of the NFIP more efficient and effective



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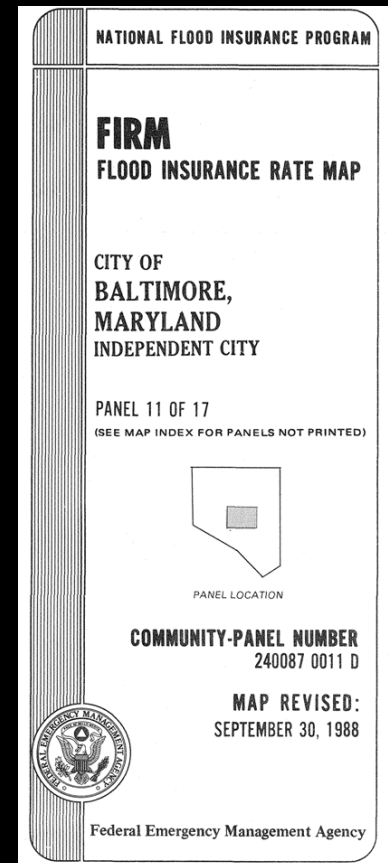
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Current FEMA map for Baltimore City

- Published in 1988
- Jones Falls Study from 1983
- Gwynns Falls Study from 1970's
- Much of base data was from 1970's mapping



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New Flood Maps For Baltimore

- Baltimore entered a as a Cooperating Technical
- Partner
- Funded by FEMA to update flood maps, initiate new studies and publish digital flood maps (DFIRM)
- To be published in 2008/2009 with 2007/2008 studies and 2006 data



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New Flood Maps For Baltimore

- **Specific New Hydraulic and Hydrology (H&H) for the Gwynns Falls and Herring Run. New Studies for Russell Street and Lower Jones Falls**
- **Uses historic data to develop the quantity of flow**
- **Model and predict its flow on the surface and through pipes**



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New Flood Maps For Baltimore

- Tidal model
- Uses same principles but bases it on historic storm events
- Mapping includes 100 year storm, 500 year storm and high velocity waves
- Not predictive of future base elevations



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Climate Change and Sea Level Rise

Intergovernmental Panel on Climate Change (IPCC)



- Evaluates the risk of climate change caused by human activity
- Established in 1988 by two United Nations programs
- Does not carry out research or conduct monitoring directly
- Publishes special reports on topics relevant to climate change
- Assessments are based mainly on peer reviewed and published
- Issues fourth assessment in 2007



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Climate Change and Sea Level Rise

2007 IPCC Report

- Warming of the climate is unequivocal
- Most of the observed increase in anthropogenic in origin due to increasing greenhouse gas emissions
- Sea Level Rise (SLR) would continue for centuries due to the timescale and climate feedback systems even if greenhouse gas emission were stabilized



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Climate Change and Sea Level Rise

Causes of Sea Level Rise

- Thermal expansion of water
- The contribution from glaciers and ice caps (not including Greenland and Antarctica)
- Contribution from the two major ice sheets



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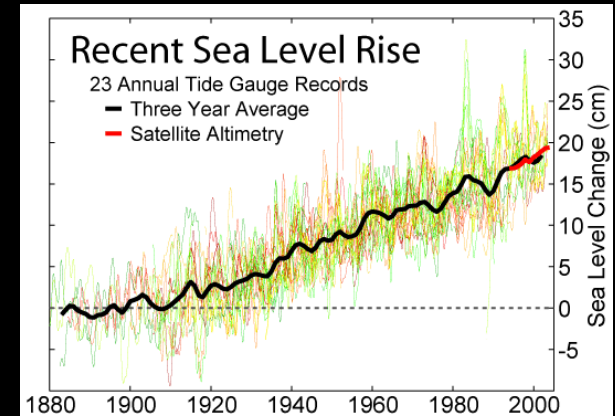
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Climate Change and Sea Level Rise

- Complexities of measuring SLR
- International model and scenarios
- Local effects of land subsidence and post glacial rebound



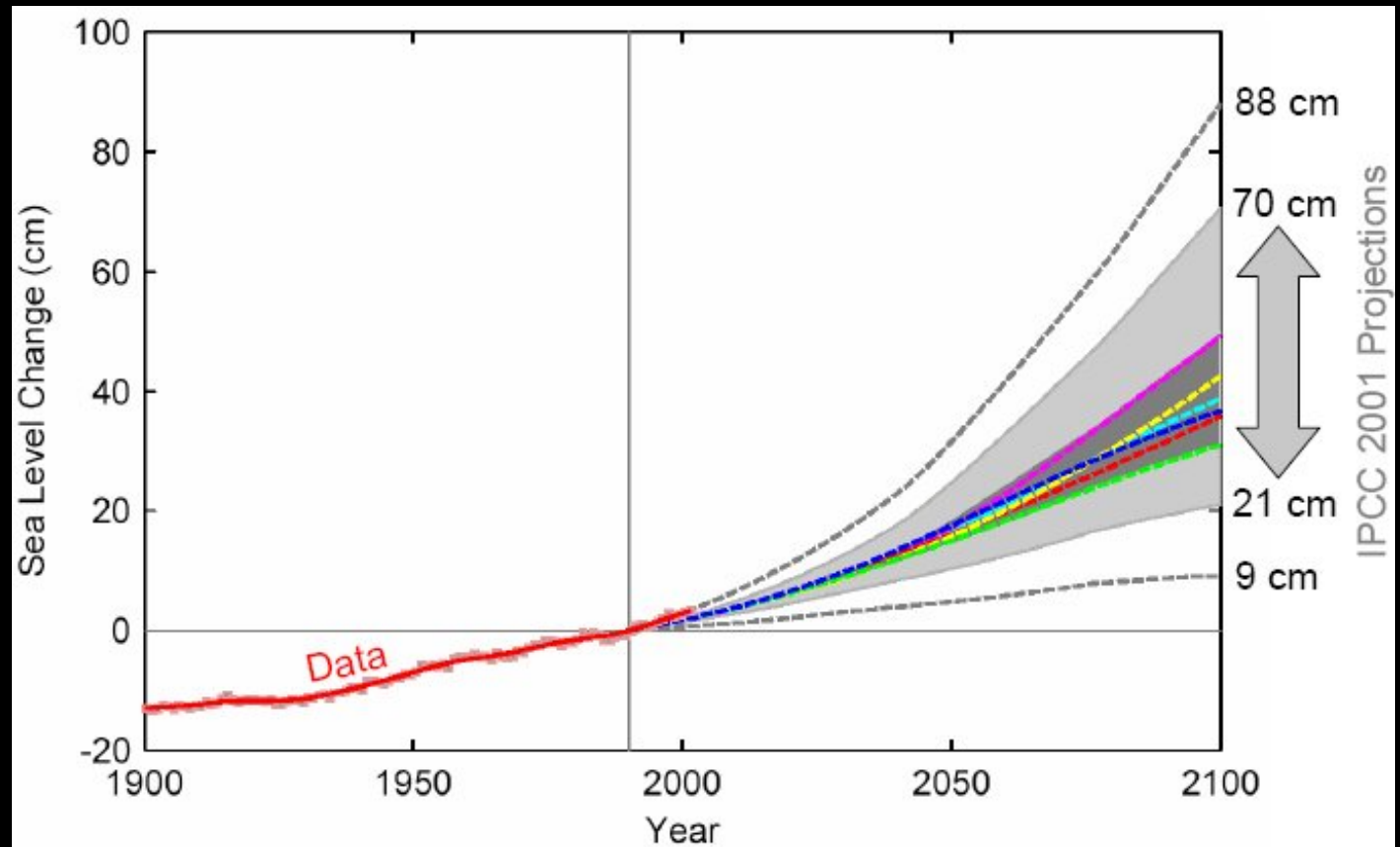
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Climate Change and Sea Level Rise



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Climate Change and Sea Level Rise

Maryland Climate Change Commission

- Work groups on Adaption and Response, GHG and Carbon Mitigation and Scientific and Technical
- MD Impacts from SLR include land loss and higher floodplain levels
- The responses required to protect human life and property fall broadly into three categories:
 - retreat,
 - accommodation and
 - protection.



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Climate Change and Sea Level Rise Next Steps in MD and Baltimore

– State Action on Commission Report

- Reduce Greenhouse Gas emissions
- Plan for risks from SLR- require freeboard standard

– Baltimore

- Adopt DFIRM and new regulations
- Public Education process- risk communication
- Integrate SLR response with Sustainability Commission work



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