

Organizational Structure & Climate Planning

Elected Leaders Regional Policy Seminar

Kambiz Agazi, Director
Office of Environmental and Energy Coordination
Fairfax County, VA

November 18, 2019

Issues Facing Local & State Leaders



Cultural & Recreational Opportunities

Economic Opportunity

Lifelong Education & Learning

Effective & Efficient Government

Environment & Health

Housing & Neighborhood Livability

Mobility & Transportation

Safety & Security

Empowerment & Support for Residents Facing Vulnerability

Regional Climate Impacts and Threats



Coastal/Tidal Flooding



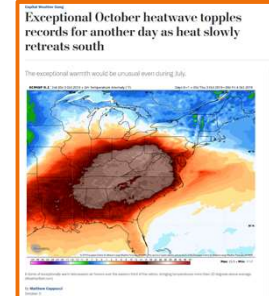
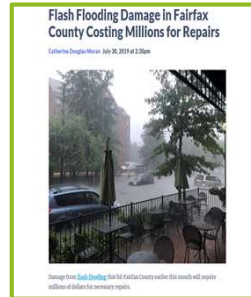
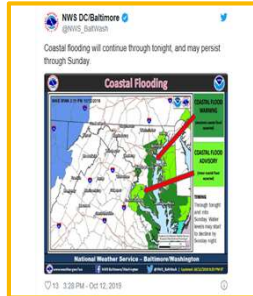
Extreme Precipitation



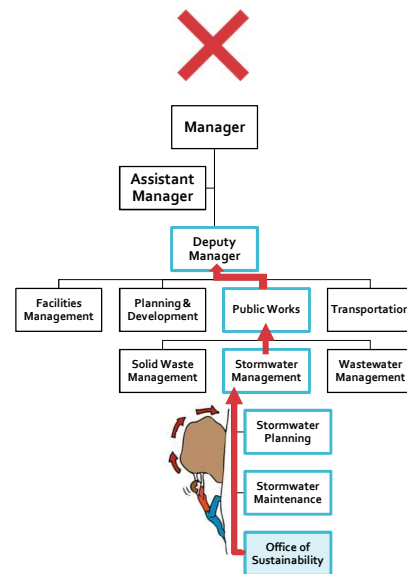
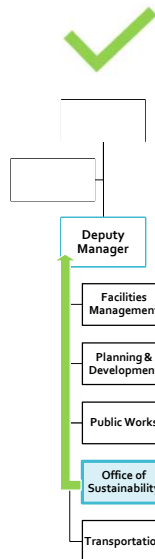
Extreme Heat



Health



Organizational Structure

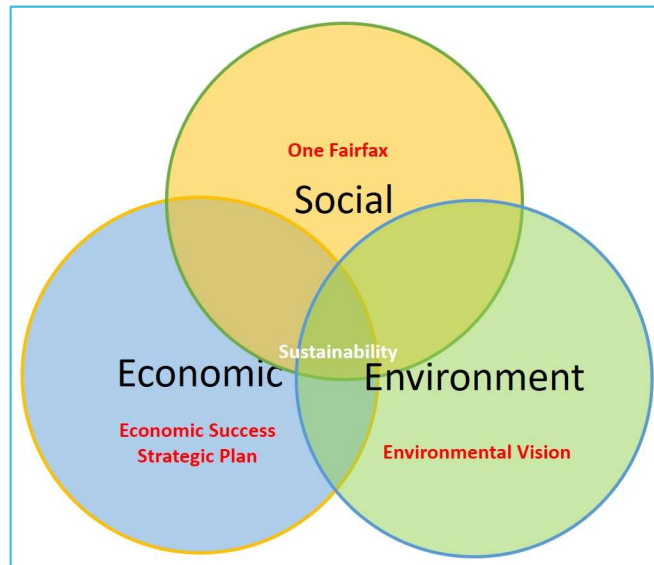


Climate & Energy Planning

Fairfax County Community Wide Energy and Climate Action Plan (CECAP)

Aspects of a Successful Plan:

Social
Economic
Environmental



Climate & Energy Implementation Challenges

Current Roadblocks

What's Needed

Regional Collaboration
Removal of Impediments
Implementation Tools

Roles & Responsibilities

Elected Leaders
Executives
Staff
Residents & Businesses





Agenda

- Zero Energy Schools
- Why Zero Energy
- Barriers to Zero Energy
- Solar Power Purchase Agreements (PPAs)
- Lessons Learned



Zero Energy (ZE) Schools in Arlington

- A ZE building produces as much or more energy as it consumes over the course of a year.
- Discovery Elementary – September 2015
 - Certified Zero Energy by International Living Future Institute
 - USGBC first LEED Zero School
- Alice West Fleet Elementary – September 2019
 - Zero Energy target
 - Solar Power Purchase Agreement (PPA)
- New Elementary School at Reed – September 2021
 - Zero Energy target
 - Under construction



Alice West Fleet Elementary School
Opened September 2019

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Why Zero Energy?

- Creates healthy buildings and active learning environments
 - Awareness
 - Lifelong engagement
- Demonstrates commitment to environmental stewardship
- Lowers operating and maintenance costs
- Reduces greenhouse gas emissions
- Improves resiliency
 - Financial
 - Health
 - Environmental



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Energy Performance and Cost Comparison

- Average elementary school building performance
 - 65 Energy Use Intensity (EUI)
 - \$1.32/sf - Energy cost per square foot
- Discovery Elementary School – Zero Energy
 - Design: 21.1 EUI
 - Operating: 18 EUI
 - \$0.11/sf - Energy cost per square foot
 - 1/10th energy cost of average elementary school
- School division energy budget
 - @ \$1.32/sf - \$6.36 M
 - @ \$0.11/sf - \$528 K

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Barriers to Zero Energy?

- A belief that
 - It's more expensive to build.
 - It's too complex.
 - It takes more staff and experience to maintain and operate.
- Senior leadership commitment and uncertainty



New Elementary School at Reed
To be completed August 2021

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Solar Power Purchase Agreements (PPAs)

- Aligns with ZE schools
- Provides authentic teaching and learning opportunities
- Offers low cost entry to solar
- Hedges against rising electricity costs
 - 25 year fixed rate with no escalation
 - Price per kWh lower than current electricity rate
 - Estimated cost savings \$4M over contract term for first 5 projects
- Supports 2050 carbon neutral goal



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Lessons Learned

- State ZE goal up front
 - Set targets for EUIs in request for proposal
 - ZE building should not cost more than a normal sustainably designed building
- Select experienced design teams and collaborative construction partners
- County policy establishing ZE goals
- General Assembly legislation
 - Net metering rules and limitations
 - Solar PPA cap
 - Standby charges



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2019 NOVA Elected Leaders Regional Policy Seminar – E&E Panel

November 18, 2019

Chase Counts, Director of Utility Programs
 Community Housing Partners – Energy Solutions
 Weatherization | Training Center | Utility Programs





What is Weatherization

Regional Policy Seminar – E&E Panel

SAVE MONEY LIVE HEALTHIER



Weatherization – doing more with less:

- ▲ Improves thermal comfort
- ▲ Improves indoor air quality
- ▲ Extends useful life of building systems
- ▲ Preserves health & safety of occupants
- ▲ Reduces household utility bills



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Program Funding Resources

Regional Policy Seminar – E&E Panel

Federal Resources in VA PY2019 - \$16,811,174



Utility-Sponsored Programs in VA PY2019 - \$10,400,000



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Weatherization Overview

Regional Policy Seminar – E&E Panel

Weatherization Programs

- ▲ No cost to recipients
- ▲ Income and/or age eligibility criteria
- ▲ Single-family & multifamily properties
- ▲ Owner or renter occupied
- ▲ Utilize the WAP provider network

Delivered by Weatherization providers and our trained, credentialed, and licensed contractor network to DOE mandated material and installation specifications



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What We Do – Energy Efficiency

Regional Policy Seminar – E&E Panel



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What We Do – Health & Safety

Regional Policy Seminar – E&E Panel

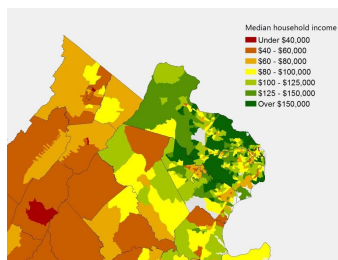


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Challenges & Opportunities

Regional Policy Seminar – E&E Panel



Source: <http://statcdata.org/2015/11/23/northern-virginia/>

Rank	County	Median Household Income
1	Loudoun	\$134,464
3	Fairfax	\$115,717
6	Arlington	\$110,388

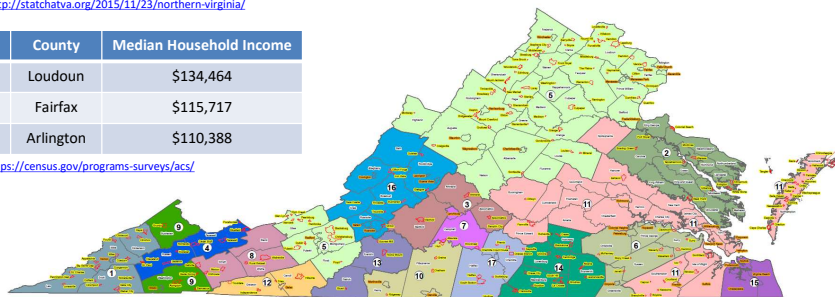
Source: <https://census.gov/programs-surveys/acs/>

Area Median Income vs. State Median Income

Eligibility is based on income. If your total household income is less than 60% of state median income, you may qualify:

Size of family unit	Income limits	Size of family unit	Income limits
1	\$31,349	5	\$69,932
2	\$40,994	6	\$79,578
3	\$50,640	7	\$81,386
4	\$60,286	8	\$86,860

Source: <https://www.dhcd.virginia.gov/sites/default/files/Docx/weatherization/income-limits.pdf>



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Other Opportunities

Regional Policy Seminar – E&E Panel

Engage with Weatherization

- ▲ Tour a job site
- ▲ Present at town hall meetings
- ▲ Exhibit at public events
- ▲ Articles in local publications
- ▲ Guide citizens to online resources
 - <https://www.dhcd.virginia.gov/wx>
 - <https://www.virginiaenergysense.org/incentives/residential-energy-saving-incentives/>



State & Local Government Support

- ▲ Marketing & outreach support
 - Property tax inserts pilot program with Falls Church
- ▲ Support clean energy standards (EERS & RPS)
- ▲ Broaden scope of SCC stakeholder groups established in 2018 SB 966

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Government Solutions – CHP Energy Solutions

Regional Policy Seminar – E&E Panel



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Transportation and Vehicle Electrification (i.e. Let's Talk about All Things Electric Vehicles)

2nd Annual NOVA Elected Leaders Regional Policy Seminar

November 18, 2019



Electric Vehicles

Electric Vehicle Charging Infrastructure

Public Transit





Electric Vehicles – Benefits and Challenges

Benefits

- Lower & stable cost of operation
- Low-to-no tailpipe emissions
- Pleasant & performant
- Climate action strategy w/ renewable energy
- Electric grid services

Challenges

- Transition of 100+ year old global industries (auto, oil, etc.)
- Cost premium
- Consumer anxiety / education
- Technology and manufacturing innovation/disruption
- Maintains auto-centric transportation system



Battery-electric (BEB) & Plug-in Hybrid Electric (PHEV)

ECO-CITY ALEXANDRIA
environment economy community



Electric Vehicles – Opportunities

Opportunities

- Fleet procurements
 - Fleets & cooperative/bulk purchasing
 - Taxi's & rideshare
 - Logistics & goods movement
 - Ports
- EV-ready ordinances / development conditions
- Parking and financial incentives
- Reducing permitting costs/time
- Personal property tax opportunities
- Ownership models
- Electricity rate structures
- Support education & outreach
- Emissions & low-carbon fuel standards
- EV/Zero-emission Vehicle (ZEV) targets

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EV Charging Infrastructure – Benefits and Challenges

Benefits

- Distributed “fueling” opportunities
- Resiliency

Challenges

- Locations – siting, permitting, etc.
 - Residential
 - Commercial centers
 - Multi-dwellings
 - On-street
- Fueling time
- Integration with existing transportation networks
- Business models and financial viability
- Electric grid integration



Source: EVgo

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EV Charging Infrastructure – Opportunities

Opportunities

- Macro-regional, state, regional, inter-municipality planning and coordination
- Public-private-utility coordination
- Advance new mobility strategies
- Common standards – siting and permitting & signage/wayfinding
- Building codes
- Enabling vehicle-to-grid/vehicle-to-building integration, leveraging batteries for grid management, & intelligent charging strategies
- Renewable energy strategies

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Public Transit (incl School Buses) – Benefits and Challenges

Benefits

- Lower cost of operation
- Low-to-no tailpipe emissions
- Climate action strategy w/ renewable energy
- Electric grid services

Challenges

- Cost premium
- System configuration
- Infrastructure
- Driver training
- Electric grid integration
- Stranded assets / existing technology investments



Source: Proterra

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Public Transit – Opportunities

Opportunities

- Regional, inter-municipality planning and coordination
- Cooperative purchasing
- Public-private-utility coordination
- Enabling vehicle-to-grid/vehicle-to-building integration, leveraging batteries for grid management, & intelligent charging strategies
- Electricity rate structures
- Overcoming high upfront cost
- Support transition away from existing fueling
- Operations & maintenance training
- Climate Action & renewable energy strategies

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Additional Thoughts

- *****Mobility FIRST***** vs Auto-centricity
- Energy efficiency for transportation system technology
- Pathway for climate action
- Climate and emissions - short- and long-run tensions and implications
- Energy security
- Emergency response needs?
- Enhance electric grid infrastructure utilization?
- Electric grid of the future?
- Who owns and controls infrastructure? What is the government's role?
- Enabling and advancing new mobility strategies
- Are all vehicles able to be electrified?



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<http://www.alexandriava.gov/eco-city>





THE FUTURE IS NOW

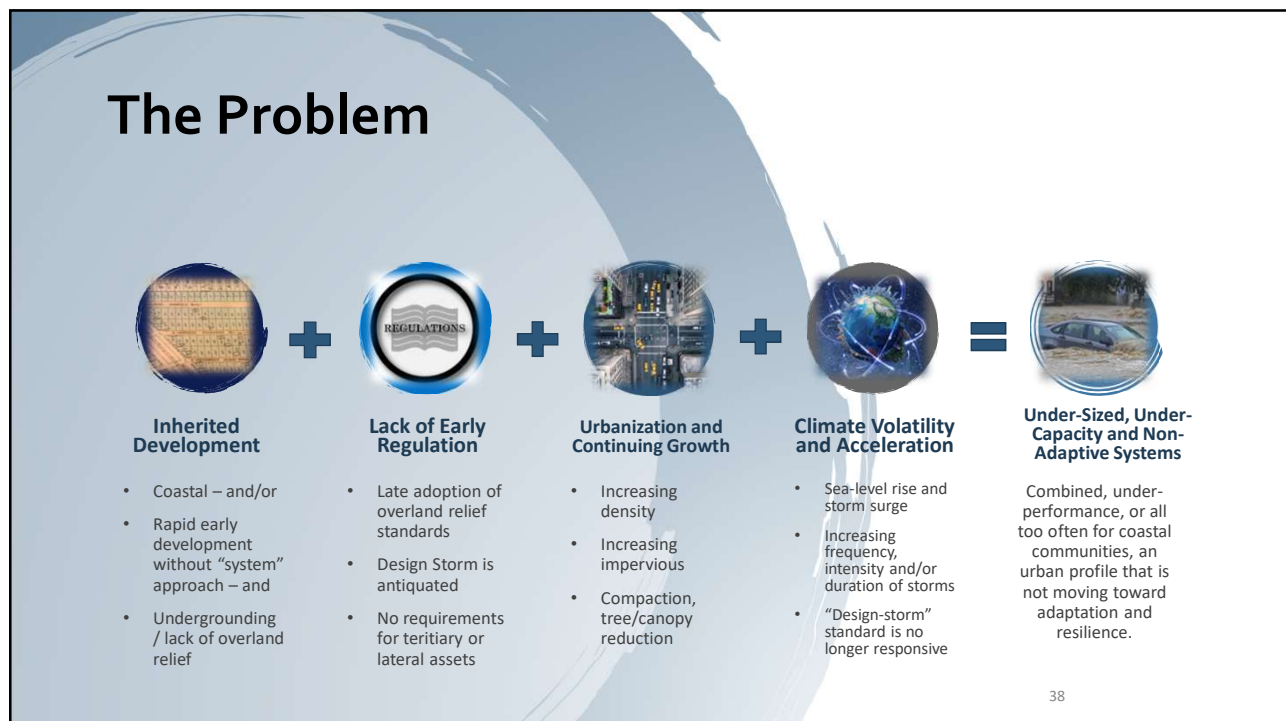
MITIGATION + ADAPTIVE PLANNING FOR STORMWATER

2ND ANNUAL NOVA ELECTED LEADERS' REGIONAL POLICY SEMINAR
18-NOVEMBER-2019

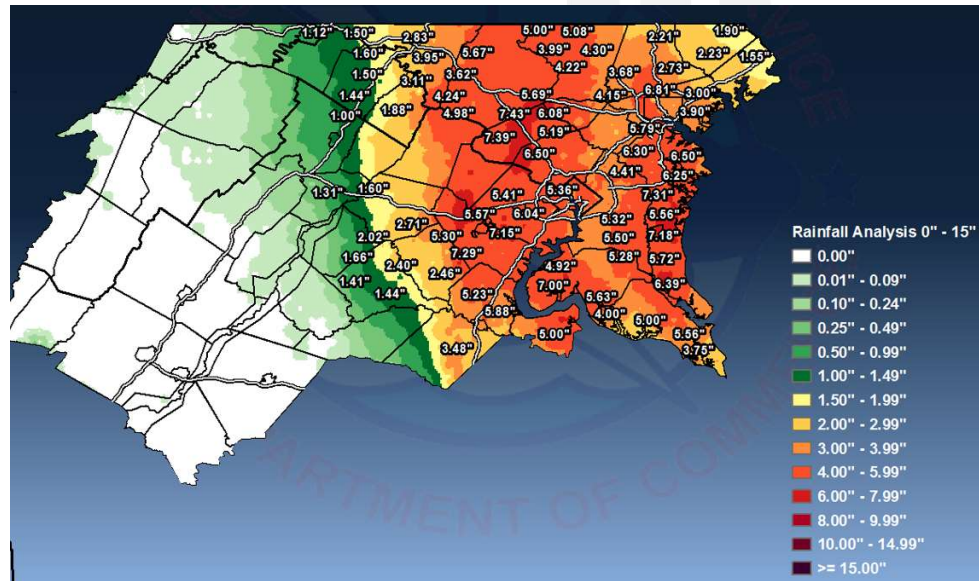


INTERIOR FLOODING / SLR

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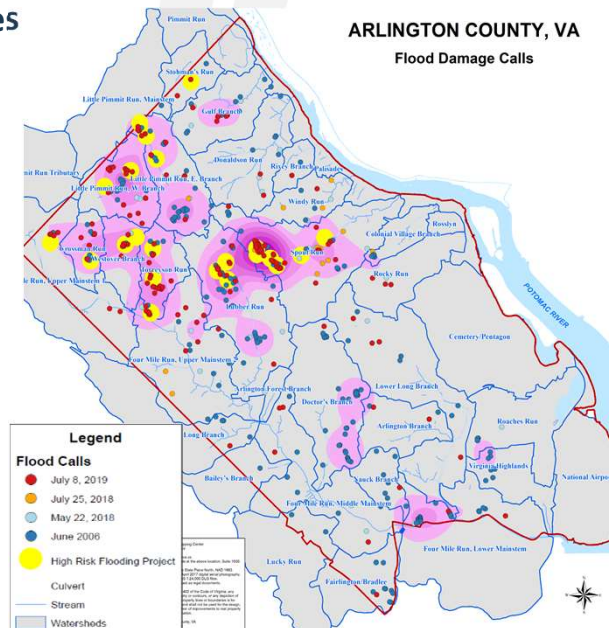
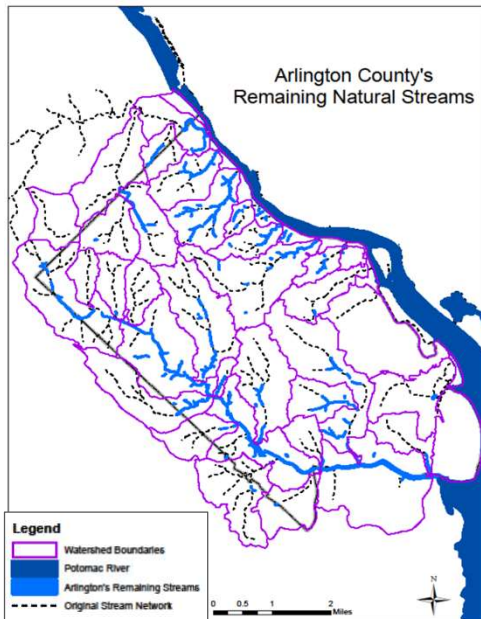
2018 – PATTERN OF REPETITIVE INTENSE STORMS



NWS – Baltimore/Washington
Rainfall Totals 07/21 – 07/22/2018 (8:00 AM – 8:00 AM)

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2006 – 2019 History Has Consequences



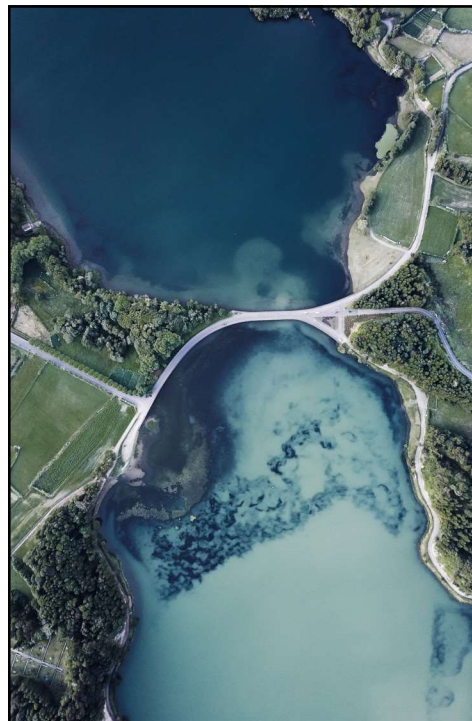


GOVERNMENT RESPONSE – RAPID AND IN-DEVELOPMENT

- Hazard Preparation, Mitigation and Response
- Rapid Repair and Clean-Up
- Policy
 - Land use and re/development
- Practice
 - Inventory asset and asset condition
 - Develop cycle of reinvestment – upgrade/repair/replacement
- Assessment – Risk Management Modeling
- Reinvent the Engineering Toolkit – Amplify the System
 - Property acquisition
 - Increased detention systems
 - Multi-purpose public spaces
- Community Outreach, Education & Action
 - Pivot to “Flood Resilient Arlington” Umbrella Program
 - Technical support at SI (substantial impact) properties
 - Public Forums (wet and dry flood-proofing, insurance, FEMA)
 - Fairfax – waived permit fees for repairs and restoration
 - Increased communications and information-sharing

Think in terms of Elastic Response, not Reactive Response

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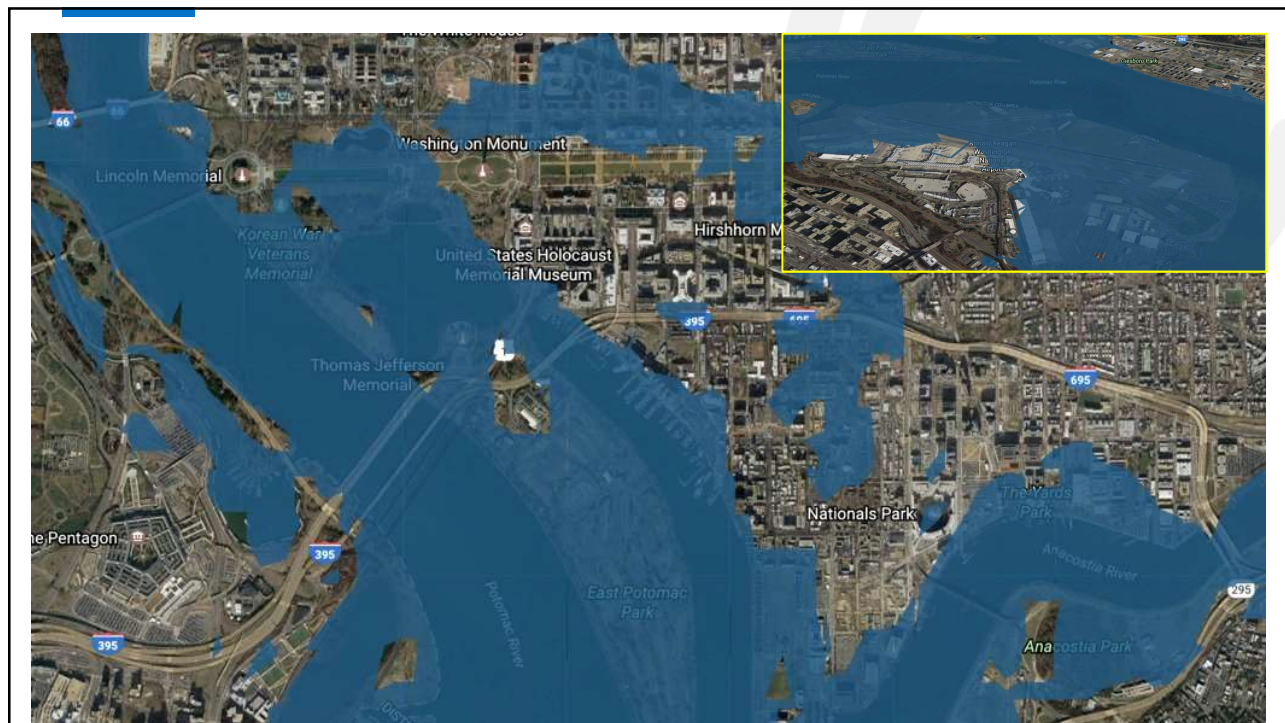
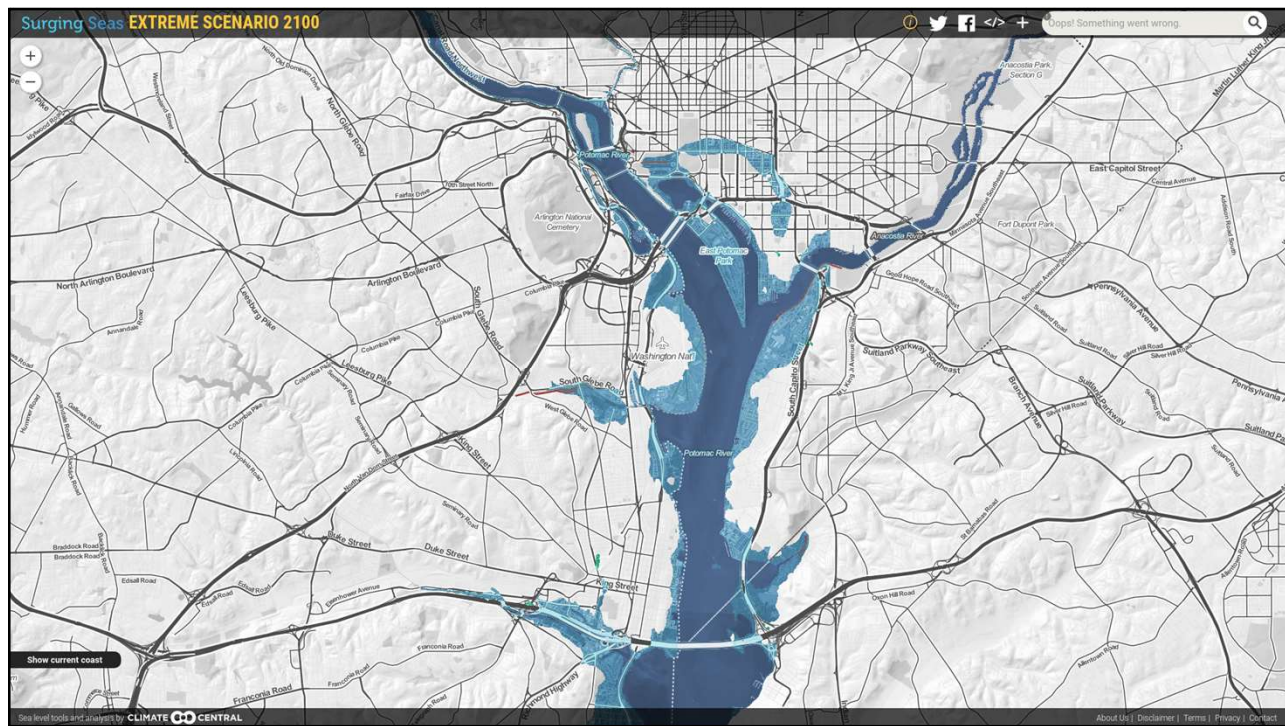


CLIMATE ADAPTATION

“MITIGATION” IS BEHAVIORAL CHANGE THAT REDUCES GHG EMISSIONS/IMPACTS

“ADAPTATION” IS MODIFYING SYSTEMS TO MANAGE THE CHANGE WE CANNOT AVOID





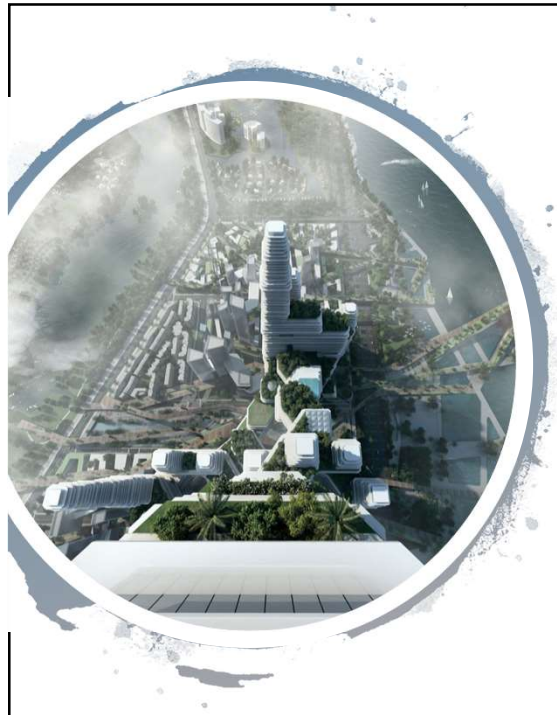
ALEXANDRIA – LEGACIES FROM A SHORELINE

SHORELINES - LIKE STREAM SYSTEMS –
REVEAL INCREASING AND FUTURE IMPACTS



HISTORIC ALEXANDRIA – WHEN
NATURE ADVANCES, IT RECLAIMS

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THE 5 FALLACIES OF ADAPTATION/RESILIENCE

1. The science is too speculative ❌
2. It's too far off in the future – we have “today” problems ❌
3. Resilience projects don't have current benefits ❌
4. FEMA and insurance will take care of it ❌
5. Resiliency and adaptation projects cost too much ❌

ADAPTIVE DECISION-MAKING AND EXECUTION

- Rethink land use
- Unprecedented policies
- Long-term planning
- Inter-departmental partnerships
- Revision the CIP
- Incentivize powerful behavioral change (combine government control with generosity)

CROSS-JURISDICTIONAL COLLABORATION

- Collaboration for greater local control (legislative changes)
- Collaborate to leverage costs and upsize success
- Innovative regional collaboration - resilient vision/design competition

THE UNIQUE AND CONSIDERABLE VALUE OF RESILIENT COMMUNITIES

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DESIGN AND IMPLEMENT VEHICLES FOR SUCCESS



RISK ASSESSMENT AND MANAGEMENT PLANS

- 1) What is the probability of an event and the scale of its impact
- 2) Business Risk Model
 - Loss or replacement of asset
 - Loss of economic activity
 - Loss of revenue
 - Change in operating costs



HAZARD MITIGATION PLANS

Typically addresses both pre- and post-hazard mitigation and response measures and strategies. Focus is on public safety & security, and the rebound and quick restoration of services.



COMPREHENSIVE PLANS

Addresses resilience and adaptation in each component of a jurisdiction's Comp Plan. The challenge is what is the mechanism that renders the components operational in a high-performance, cost-effective manner?



SUSTAINABILITY OR CLIMATE ACTION PLANS

Sustainability and Climate Action Plans increasingly take on the goals and outcomes of resilience or climate adaptation. The challenge is how to empower that single agency within a government to manage other agencies.

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DEPARTMENT OF
ENVIRONMENTAL SERVICES

THANK YOU

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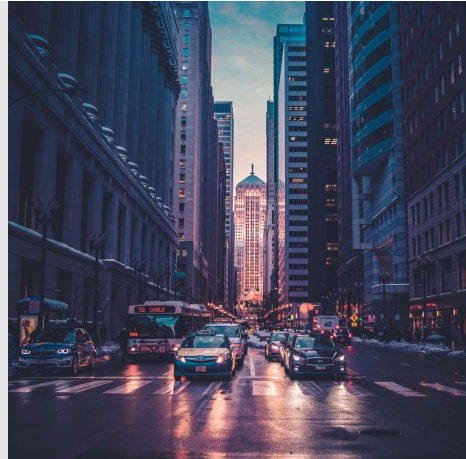
Demetra J. McBride, Bureau Chief
Office of Sustainability and Environmental
Management
Direct: 703-228-3612

ADAPTATION – SAMPLING OF WHO'S WHO AMONG STATES / CITIES



CITY-BASED STRATEGIES

- Louisiana** - LA SAFE property buyouts, wetland restoration, public harbor for sheltering, and mental health services
- S. Carolina** – legislation to buy out high-risk properties and erect natural buffers
- New Jersey – Blue Acres BuyOut Program (2012)** To date, more than 700 homes across 16 communities over 9 counties



SUB-REGIONAL CASE STUDY SILICON VALLEY 2.0

- 9 Sectors, including Transportation, Energy, Water and Wastewater, Telecommunications, Public Health and Ecosystem Services
- Risk assessment approach – *the cost of inaction*
- Decision-Support Tool
- Portfolio of Strategies/Measures by Sector
- Implementation Map by Strategy or Measure

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LITERATURE REVIEW

- Innovation Awards C40 <https://www.c40reinventingcities.org/>
- Sea Level Rise Solutions (with free FloodIQ tool), <https://sealevelrise.org/solutions/>
- Water Environment Foundation, Stormwater Report, <https://stormwater.wef.org/>
- Rebuild by Design (Research, Innovation Competitions, etc), <http://www.rebuildbydesign.org/>
- Science Direct, “Institutionalizing the Urban Governance of Climate Change Adaptation”, <https://www.sciencedirect.com/science/article/pii/S221209515300031>
- Chesapeake Physicians for Social Responsibility, “State and Local Governments Must Lead on Climate Action”, <http://www.chesapeakepsr.org/blog/2018/1/16/state-and-local-governments-must-lead-on-climate-action>
- Institute for Local Government, Climate Action Plans, <https://www.ca-ilg.org/climate-action-plans>
- “The Role of Managed Retreat in Adapting to Sea Level Rise,” Energy Innovation Policy and Technology, <https://energyinnovation.org/2018/12/17/the-role-of-managed-retreat-in-adapting-to-sea-level-rise/>
- National Municipal Stormwater Alliance, <https://nationalstormwateralliance.org/>
- Inside Climate News, “Six of the World’s Most Extensive Climate Adaptation Plans”, <https://insideclimatenews.org/news/20130620/6-worlds-most-extensive-climate-adaptation-plans>
- “Assessing Disparities of Urban Flood Risk for Households of Color in Chicago”, Center for Neighborhood Technology, <https://www.cnt.org/publications/assessing-disparities-of-urban-flood-risk-for-households-of-color-in-chicago>
- Silicon Valley 2.0 --<https://www.sccgov.org/sites/osp/Pages/sv2.aspx>
- New Solutions for Sustainable Stormwater Management in Canada (September 2016), Sustainable Prosperity, <https://institute.smartprosperity.ca/sites/default/files/stormwaterreport.pdf>
- Georgetown Climate Center, State and Local Climate Adaptation Plans, <https://www.georgetownclimate.org/adaptation/plans.html>
- <https://www.reuters.com/article/us-climatechange-mortgages/citing-climate-risk-investors-bet-against-mortgage-market-idUSKBN1WE0D3>
- <https://www.marketwatch.com/story/climate-change-could-impact-your-mortgage-even-if-you-live-nowhere-near-a-coast-2019-09-30>
- Moody’s to Weigh City Efforts to Cope With Climate Change in Bond Ratings, <https://www.claimsjournal.com/news/national/2019/10/15/293588.htm>

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