Sustainable Shorelines Community Management in Northern Virginia Phase III

Northern Virginia
Sustainable Shoreline and Community Management Project

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Virginia Coastal Zone
MANAGEMENT PROGRAM

DEQ
Virginia Department of Environmental Quality
Virginia Coastal Program

NOAA

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Northern Virginia Regional Commission

Sustainable Shorelines Community Management in Northern Virginia Phase III

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Introduction~ Project Overview

The Sustainable Shorelines and Community Management Project is a collaborative planning effort between the localities, major landholders, and universities in Northern Virginia that border the tidal Potomac River. The project is in its third phase, and continues to build upon the regional and international planning efforts for relative sea level rise and storm surge.

Phase III, of this three phase project, looks closely at the relationships in regional and international planning, and focuses on communication into the future.

This report fulfills the product requirements set forth in the 2010 Virginia Coastal Zone Management Program Grant, Task 12.07 (NOAA Grant #NA10NOS4190205) for:

1. Workgroup Outcome Report
2. Adaptation Report
3. Communication Report

NVRC and its partners conducted a variety of efforts to engage a diverse group of constituents through surveys, meetings, and workshops. International partners were brought in to exchange ideas that could relate to efforts underway within this region.

Several workshops were conducted which provided the broader stakeholder groups to invest in the work conducted overseas that could directly impact and facilitate change in Northern Virginia.

NVRC's third year of funding for the Sustainable Shorelines Community Management in Northern Virginia project brought a more diverse look to the issues and challenges the region faces. In concert with the NEMO and the existing workgroup, strategies were developed for the Northern Virginia region to proactively prepare for impacts from inundation due to projected sea level rise and storm surge flooding.

About the Project

- **Sustainable Shorelines Community Management in Northern Virginia addresses coastal hazards and sea level rise preparation in a collaborative manner.**
- **The Sustainable Shorelines Community Management Project seeks to regionalize planning efforts for sea level rise (SLR) in Northern Virginia**
- **Distinct working groups comprised of local officials, academics, and other experts, will focus on opportunities for collaboration in the areas of data/projections, policy, and economic impacts**

Summary

Workgroup Outcome Report

NVRC and the Virginia Network for the Education of Municipal Officials (NEMO) program continued to coordinate a workgroup comprised of staff representatives from localities, military installations, universities, major land managers, including the National Park Service, DCR – State Parks, and the US Fish and Wildlife Service – Occoquan Complex, and other major stakeholders. Major Workshops were held with organizations who might be interested in participating due to their vested interest in the Potomac River shoreline, and the Chesapeake Bay.

Discussions with the workgroup shifted toward the barriers and challenges the region faces in planning creatively for climate change and sea level rise.

Possible tools for dealing with the identified problems came from national and international efforts already underway.

The Workgroup engaged in discussions and work sessions facilitated by NVRC, Mid-Atlantic APA, the Royal Netherlands Embassy and Virginia NEMO, which focused on the challenges to communicating and planning for the effects of climate-related storm events. These discussions included the broader public with local and state policymakers of the region.

Looking Back to Look Forward Workshop

The "Looking Back to Look Forward" workshop on April 23, 2012 focused on the challenges to communicating and planning for the effects of climate-related storm events with the broader public and with local policymakers in Northern Virginia. Representatives from Fairfax and Prince William Counties, the City of Alexandria, the U.S. Fish and Wildlife Service, Virginia Department of Conservation and Recreation, the U.S. Army Corps of Engineers, Metropolitan Washington Council of Governments, and Virginia Department of Transportation were present. Discussions were framed around two case studies in Fairfax County, the Belle Haven and Huntington communities, which are two "hot spots" of flooding impacts in the County. A presentation by Virginia DCR focused on methods of flood damage mitigation through higher regulatory standards imposed through floodplain ordinances.

Barriers and Challenges

The workgroup decided that the barriers and current issues concerning planning for flooding, sea level rise and storm surges associated with climate change seem to be primarily due to lack of funding for mitigation projects and the impacts to the existing communities. Workgroup members shared their experiences determining and implementing protective strategies in areas with frequent inundation from storm surge and riverine flooding events.

Discussions with the workgroup helped to shape elements of the adaptation report. The workgroup discussed the important similarities between the mitigation strategies of the plan and adaptation strategies under discussion.

Workgroup Outcomes

The workgroup continued to recognize the importance of public perceptions in planning for future considerations. With their input, the workgroup identified possible tools for dealing with the problems including strengthening regulations for future development and retrofits in the floodplain, including the implementation of higher standards in floodplain ordinances. Standardization of a baseline risk management level was identified as a needed component of future planning, but participants acknowledged the difficulty of implementation.

There continued to be tremendous value in engaging a diverse workgroup throughout this project. Participants in the workgroup meetings have become engaged stakeholders within their respective organizations. The identified strategies by workgroup were vetted through the appropriate channels. The strategies may include amendments to existing policies and codes, and/or identify and pursue new policies as they relate to sustainable shoreline management and coastal community planning.

APA Mid-Atlantic Regional Planning Roundtable ~ *Sustainable Regions: States and Localities Working Regionally in the Mid-Atlantic*

The Mid-Atlantic Planning District Commissions, NVRC and Virginia Tech conducted the 8th Regional Planning Roundtable on March 30, 2012, which included a full panel on the Challenges of Water Management and Coastal Mitigation. The workgroup members were among 80 participants at this workshop. NVRC brought in experts from the Netherlands.

Mr. Brack Bentley, former Town Manager of Vienna and Front Royal, Virginia, put the fundamental water problem for public managers this way: "Water - there's either too much, or not enough, and in the wrong place". The Water panel addressed collaborative approaches used for low-lying/sea-level communities that manage both storm water drainage and external storm surge intrusion. Government, the private sector and the research community were urged to work side by side to develop new technologies, strategies and policies that meet today's water challenges, utilizing all relevant experience to deal with extreme weather events. Case studies at the international, national and regional levels

were presented, including lessons from the Dutch Delta Programme as are being applied in New Orleans and Florida. Work is underway at both the Metropolitan Washington Council of Governments regional scale and that of the Northern Virginia Regional Commission, all within the Mid-Atlantic's Chesapeake Bay watershed which is under influence of the Atlantic Ocean and its seasonal storms. The Moderator of the program was Aimee Vosper, ASLA, PLA, Director, Planning and Environmental Services, NVRC. The following made up the panel:

1) Delta Programme Water Management Knowledge for U.S. Coastal Areas

a) Dale Morris, Senior Economist, Dutch Embassy

b) Pex Langenberg, Senior Dutch representative from the Netherlands Ministry of Transport, Public Works and Water Management

2) Adaptation Planning - Water Resources and Coastal Protection - Increasing community resiliency to risks of extreme weather events at regional scales.

a) Laura Grape, Senior Environmental Planner, Northern Virginia Regional Commission

b) Maia Davis, Environmental Planner IV, Metropolitan Washington Council of Governments

Workshop Outcomes

Managing water supplies and stormwater influence land use matters at the local and regional level, yet they are often afterthoughts in planning processes. Water issues lack a "constituency" or voice in local and regional planning. This often results in these issues being left off the table in planning matters, which in turn results in conflicts when water issues must be addressed.

- Urban areas are increasingly faced with the need for new water supplies to meet growing demand. New stormwater management requirements will dramatically affect how property is developed in the future. Environmental adaptation will be needed to account for rising temperatures, increasing sea levels, land subsidence, and increasing frequencies of extreme weather events. A sustainable approach to water infrastructure issues must integrate strategies and policies to "live" with water, rather than "fight" with water.

The workshop addressed how these issues can be more effectively introduced and integrated in local and regional planning processes.

Climate Adaptation Planning: Local-Level Strategies for US Communities~ Workshop with the Royal Netherlands Embassy

The Northern Virginia Regional Commission and the Embassy of the Kingdom of the Netherlands organized a joint one-day dialogue January 14, 2013 to discuss the exchange and application of mutually beneficial and innovative climate adaptation policies. Over 100 scientists, researchers, technical and policy experts, academicians, NGO officials and elected officials (national, state and local level) met at the Embassy for the "Climate Adaptation Planning: Local Level Strategies for US Communities" conference. The participants reviewed national and sub-national climate adaptation approaches from the Netherlands, particularly the Province of North Holland. They heard about case studies concerning US cities, such as New Orleans and the California Central Valley, in which Dutch climate adaptation policies were evaluated and adopted – leading to resiliency and economic development in those regions of the US. The audience heard how Northern Virginia actively and systemically applies innovative urban sustainability lessons from European regions, including climate adaptation policies from the Netherlands, and represents the next step in this model transatlantic conversation.

Peter Mollema, Vice-Ambassador of the Royal Netherlands Embassy, and Janneke de Vries, Counselor for Spatial Planning and the Environment, Royal Netherlands Embassy, and NVRC Chairman Martin Nohe, Chairman, kicked off a review of the unique collaboration that has evolved between the Netherlands and NVRC. Starting in 2012, NVRC hosted Suzan van Kruchten, a technical research expert and NVRC intern from the Province of North Holland who reviewed multiple technical and policy climate adaptation innovations and the opportunities to transfer them from the Netherlands to Northern Virginia. Suzan's work and the subject of resilient cities was discussed on a panel consisting of Suzan, Karen Arpad (Sectoral Manager Water, Province North-Holland), Pete Wijsman (Arcadis), and David Waggonner (Waggonner & Ball Architects). The panel also looked into Dutch climate adaptation policies and the experiences of New Orleans in applying those innovations, especially in 2012 after Hurricane Isaac.

Juliet Eilperin from the Washington Post facilitated a discussion with Jay Fisette, Member, Arlington County Board, Laura Grape, Executive Director, Northern Virginia Soil and Water Conservation District, Todd LaPorte, Associate Professor, School of Public Policy, George Mason University, and Frank Lowenstein, Climate Adaptation Strategy Leader for The Nature Conservancy's Global Climate Change Team about how these lessons from the Netherlands can find application in Northern Virginia. Congressman Gerry Connolly concluded the conference with a keynote speech and reaffirmed the need to learn from the Dutch experiences with creating resilient cities. He addressed the value of coordinated policy and technical exchange between the federal and local governments.

Workshop Outcomes

These core themes emanated from the conference panels and speeches:

- The Dutch are global technical and policy pioneers with climate adaptation;
- Balancing green and gray infrastructure variables in the climate adaptation equation is vital to successful adaptation strategies at the local and regional level;
- Climate adaptation is a very complex and technical subject. What works in the Netherlands requires thoughtful investment of time and effort to understand how these apply to US regions such as New Orleans or Northern Virginia. But it can be done and there are economic, environmental and social benefits to be realized in the US as a result of this structured conversation across the Atlantic.
- NVRC is a US pioneer in developing problem-focused, goal-oriented and continuous policy transfers of innovations with European cities and regions that strengthen Northern Virginia.

Adaptation Strategy Report

As part of the Phase II reporting, a draft Adaptation Strategy was developed to begin to incorporate alternative measures in dealing with the challenges of storm surge and sea level rise. Also, as part of the Phase I reporting the *Policy Inventory and Local Consistency Report* now serves as a reference for Northern Virginia's localities along the tidal Potomac River, as they consider adaptive responses for areas vulnerable to relative sea level rise and storm surge identified through the Northern Virginia Sustainable Shorelines and Community Management Project. This Phase III report completes the phase II draft adaptation strategy and includes an inventory of existing adaptation strategies and lessons-learned from pioneering areas within the United States and abroad. These strategies are consolidated under three broad categories established by the International Panel on Climate Change's (IPCC) Coastal Zone Management Subgroup (November 1990); they are defined as:

- Retreat – abandonment of land and structures in vulnerable areas and resettlement of inhabitants;
- Accommodation – continued occupancy and use of vulnerable areas; and
- Protection – defense of vulnerable areas, especially population centers, economic activities, and natural resources.

Additionally, through Phase III reporting, the best practices and presentations from the Dutch workshop, *Climate Adaptation Planning: Local-Level Strategies for US Communities~ Workshop with the Royal Netherlands Embassy* provide an inventory and comparison of policies and planning documents that can be adopted by Northern Virginia's localities in relation to tidal shoreline and floodplain management, Chesapeake Bay Preservation, climate change planning, and other comparable efforts. By combining local planning efforts with lessons-learned from across the world, specifically the Netherlands, New Orleans and San Francisco this report will continue to assist Northern Virginia

localities in establishing the necessary first steps in identifying adaptive measures for increasing the resiliency of their coastal communities and protecting their valuable cultural and natural heritage.

International exchange on Climate Adaptation Strategies

The coastline is the backbone of the Netherlands. The province of North Holland has planned and strategized for centuries how to contain, control, plan, and build to protect and reclaim their country from floods and climate change. The Delta Program developed and funded since 2010 does not answer to a disaster but in advance, prepares to avoid the disaster. The Delta Fund (approximately 1 billion Euro a year, or 129 billion in US dollars) funds adaptive management strategies. More than 20 levees and dune reinforcements are planned for the province between 2005 and 2020. New "closure dams", developing renewable strategies within the dam structure create an "Energy levee" using blue (water) energy, tidal energy or solar energy. New designs in levee development create additional beach and marsh wetland to buffer inlands from storm surge[1].

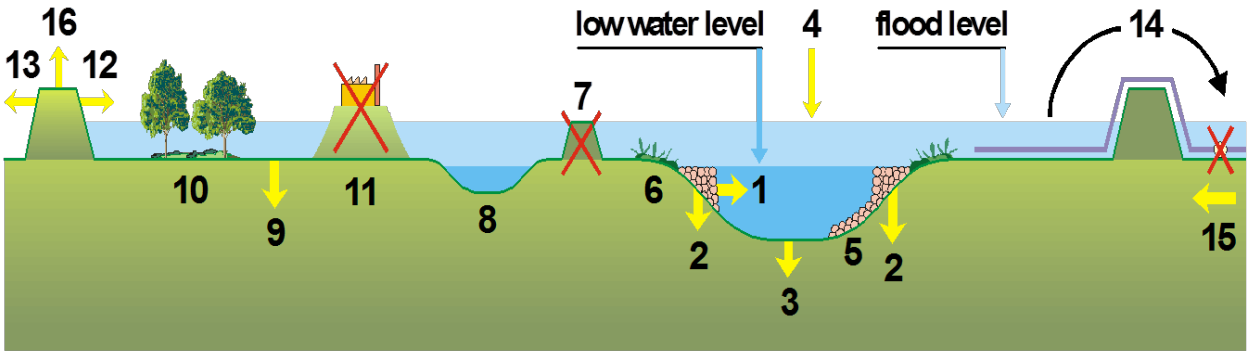
Lessons learned from the US and abroad can provide this region with creative alternatives to both large scale and small scale water management.

Spatial planning and flood risk management combine to form structure to protect and enhance the quality of life in our region.

The Province of Noord-Holland takes protection against flooding to levels the US is only now beginning to understand. With over 400 miles of coastline, 292 miles of dykes and dams and 59% of their land threatened by flooding, the benefits to creative climate adaptation strategies outweigh the cost of protection from loss of life and economic vitality. For their delta, as for our deltas, the same the same challenges future challenges exist and are measured in sea level rise, more/extreme storms, more intense rainfall, special developments, increased river discharge, increased erosion. A multi-layer safety approach is necessary to ensure the longevity and sense of place. In the Netherlands, the layers are reversed: Layer 1- Prevention of Flooding, Layer 2- Sustainable Spatial Planning and Layer 3- Emergency Planning. National programs such as the above mentioned Delta Program, and the "Room for the River" allows innovative approaches and prioritization of necessary funding to protect the assets of the region. The Delta Program goals and values dovetail the layered approach: Safety now and into the future (2050-2100), preparation for change, guaranteed fresh water supply (including in times of drought) and solidarity, flexibility and sustainability for the people and the economy. The *Delta Program* is a government collaboration in joint fact finding involving stakeholders and interest groups which build in acceptance of creative and innovative ideas. These ideas are combined with local developments. Due to the future increases in discharge, the costly need to heighten or reinforce embankments due to

the increase in overall flood risk, the *Room for the River* project looks at flood accommodation instead of only flood resistance.

ROOM FOR THE RIVER[2]

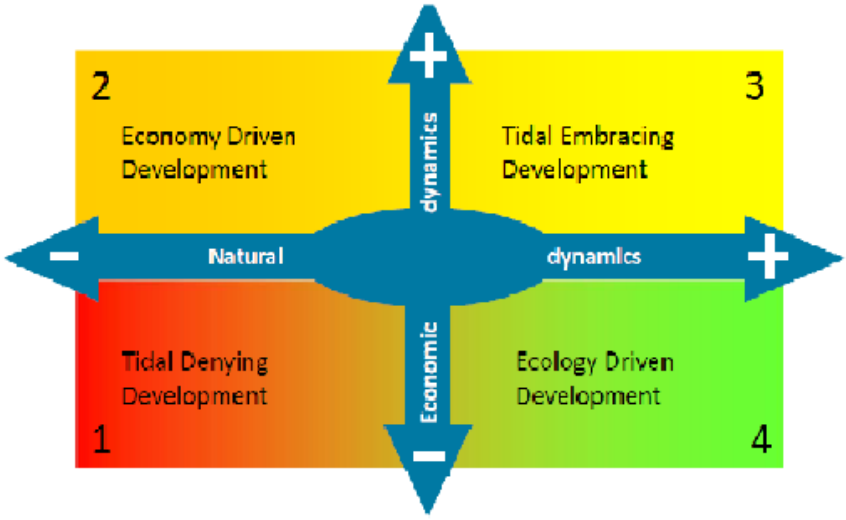


1 - narrowing of main channel
2 - lowering of groyne
3 - dredging
4 - dumping of sediment
5 - permanent layer
6 - natural bank
7 - removing of summer embankment
8 - secondary channel
9 - lowering of flood plain
10 - nature development
11 - removing of high-water free areas
12 - dike reinforcement
13 - dike repositioning
14 - retention
15 - obstruction of lateral flow
16 - dike raising

The *Room for the River* combines protection and spatial quality, creating broader public support for environmental, economic and safety measures, thus building on steady, reliable dedicated project funding. The important theory of "retain, store, discharge" allows the solutions to shift from standard flood protection measures to creative, connection to the water approaches. Increase safety, coordinate flow, balance groundwater, supplement systems, appreciate assets, enhance water quality, grow economy and enrich ecosystems become the guiding principles to climate adaptation.[2]

The Case Study in the San Francisco Bay area, *Preparing for the Next Level*, the San Francisco Bay Conservation and Development Commission through Arcadis, developed a blueprint to increase the preparedness and resilience of the area communities to sea level rise, while protecting ecosystem and community services (the Adapting to Rising Tides Project.) The project evaluated how sea level rise and storm events will affect the future of the Bay area communities, infrastructure, ecosystems and the economy, and what approaches could be pursued to reduce and manage the risks.

The goal of the project: RESILIANCE. The four square matrix developed by the project team encapsulates the benefit/risk/solution analysis driving the solutions needed in complex multilayer decisions. [3]



The strategies from the Dutch methods of adaptation are now part of the New Orleans, Post-Katrina solutions. Not only has New Orleans rebuilt the levee structure, they have turned their attention inward, to the water that is captured within the new sea walls. The Greater New Orleans Water Management Strategy begins to enlist not only the "new perimeter defense" system, but room for the river~ internal water management, ie: retain, store, and drain. Water overwhelms the systems in many of our Northern Virginia region's partners. Not only inadequate infrastructure, but groundwater imbalance causes subsidence. Water is sometimes excluded from public spaces. Managing water for resiliency however the dynamic conditions may be, limits access and economic vitality of the community. Layered planning is essential in developing alternatives to standard water challenges. The layers needed to create a world that works with water are: the Foundation (soils, water system, biodiversity), the Networks (infrastructure), the Occupation (landuse). Creation of large scale water gardens and waterparks retaining, storing and draining solve issues and create a sense of place. Reconnecting water channels and lost connections, restoring the flow, through infrastructure and land planning allows water to move through without loss to quality of life or economy.

[1]Provincie Noord-Holland Water Programs~ the Delta Programme ~ Karen Arpad, McA, Manager Water Department, Province Noord-Holland
[2]Spatial Planning and Water ~ Suzan van Kruchten, M. SC., Environmental Analyst Province Noord-Holland
[3]Case Study~ San Francisco Bay: Preparing for the Next Level ~ Peter Wijsman, Arcadis
[4]Ditch to Dutch Adaptation measures~ International best practices from New Orleans work ~ David Waggonner, FAIA, Waggonner & Ball Architects

Communication Report

Engaging the public in climate adaptation efforts can be challenging. To communicate the results of the project to the public and other interested parties NVRC worked with the Virginia/Chesapeake NEMO programs, other regional PDC's and workgroup members to develop a broader sense of communication, which included presentations and other materials for distribution to the public by NVRC and its partners. This information supports awareness and preparedness across Northern Virginia's coastal communities.

Community charrettes and education helped to determine community priorities and levels of acceptable risk. Stronger data with less reliance on debatable models was heard as a need in local government to achieve spatial planning site specific project approval. There continues to be an interest in the continuation of this work in Sustainable Shorelines. A possible opportunity for further grant funding could involve data refinement and outreach program.

NVRC continued to utilize the Chesapeake Watershed Network to improve communication and information sharing. The workgroup site was visible to workgroup members and contains presentations, discussion forums and other materials for their consideration. Networking is essential to continue the dialogue. Additional exchanges with other interested groups across the region should be considered in the future.

Communication Strategy

The Communication Strategy Goal is to continue to engage stakeholders to help create thoughtful and collaborative data collection, policy review and product development projects. These will help assist planners and decision makers and individual residents living along the shoreline adapt to the changing

climate in a manner that limits human health risk and sustains natural coastal resources. Northern Virginia is a diverse region. New partnerships must be formed to elevate the dialogue. Strategies to proactively prepare for inundation impacts are key to the dialogue and successful implementation of creating Resiliency within the region.

The Communication Strategy must be viewed as:

- An iterative process~ each event/meeting/workshop must build upon previous work
- A process in which you can learn together~ Ideas from diverse workgroups will strengthen the outcomes of each process
- A process which uses the facts & recognizes uncertainly
- A process to explore opportunities to integrate climate change and sea level rise into existing efforts
- Working together to develop a suite of options that jurisdictions can select from, as one size does not fit all.

Engaging the public in Climate Adaptation Efforts is essential to solving the regions challenges.

Communication strategies are the tools to confirm ideas and solutions to continue to move the discussion forward. The present discussions dictate the future.

Engagement strategies should continue to include the following:

- Surveys
  - Target objective and goal for information gathering
  - With defined goals for the workgroup, objectives and membership
- Listening Sessions
  - Target larger audiences, specific demographics, specific locations
  - Determine specific goals and desired outcomes
- Topic Specific Workshops
  - Target specific groups, technical, layperson and political
- Involvement at policy level within coastal zone impact areas
  - Garner participation at the jurisdictional level with presentations on findings/impacts
- Develop new partnerships with groups not currently represented, or thought to include
  - Engage all universities, HOA's, private firms, public agencies (that may not normally meet)
- Develop new creative approaches to workshops and facilitation ~ hands on approach
  - University of Virginia's Institute for Environmental Negotiation
    - Provides planning team assistance
    - New community outreach and involvement
    - Aids in meeting facilitation, recording and reporting
  - International partnerships and exchanges of personnel
    - Co-sponsor high level workshops
    - Include State, Federal and Local partners

    - Highlight economic, environmental and social benefits from corporation and partnerships
    - Create new networks for information exchange

- Develop social media campaigns
    - Reaches larger targeted audiences through radio, internet and cable TV slots
    - Supports awareness and preparedness
    - Reiterates message

These communication strategies provide public forums to inform Northern Virginia residents, organizations and stakeholders regarding the challenges the region faces and what we as a region can do proactively to plan and mitigate climate change effects. What we must invest, what we can do now, who we need to reach, and how we can garner input to solve the challenges we face all comes down to communication.

Summary

Through thoughtful and collaborative data collection, policy review, and product development the *Sustainable Shoreline Community Management in Northern Virginia* project will assist planners, decision makers, and individual residents living along the shoreline adapt to the changing climate in a manner that limits human health risk and sustains natural coastal resources.

Appendix A

SUSUTAINABLE SHORELINES PARTNER WORKGROUP MEETINGS

Sustainable Shorelines and Community Management Project
Project Partner's Workgroup

Mason Neck State Park Visitor's Center
7301 High Point Road
Lorton, VA 22079

Monday, February 27, 2012
10:00 am -1:00 pm

Meeting Agenda

1. Introductions/ Welcome

2. Activity Updates and Project Recap (10min)

3. George Mason University, Center for Climate Change Communication (45min)

4. Data and Information Dissemination (30min)
Determine most appropriate means of data and report sharing, includes GIS data to the final narrative report.

5. Regional Workshop Discussion (45min)
Identification of barriers
Planning activities

6. Next Steps (10min)

Sustainable Shorelines and Community Management Project
Project Partner's Workgroup

Mason Neck State Park Visitor's Center
7301 High Point Road
Lorton, VA 22079

Monday, February 27, 2012
10:00 am -1:00 pm

Meeting Summary

Attendees:

Laura Grape, NVRC
Mary Ann Welton, Fairfax County Dept. of Planning and Zoning
Claudia Hamblin-Katnik, Alexandria
Samantha Kinzer, NVRC
Patty Dietz, Prince William County
Clay Morris, Prince William County
Lauryn Sacha, DCR
Todd Janeski, DCR
(phone) Justin Rolfe-Redding, GMU Center for Climate Change Communications

Frank Dukes, IEN
Laura McCoy, IEN

Executive Summary:

The Sustainable Shorelines Workgroup Meeting on February 27, 2012 focused on identifying the challenges to communicating the effects of climate change with the broader public and with local policymakers. Representatives from NVRC and the localities noted that a key issue is the lack of information that is presented to homeowners and citizens about the impacts of climate change.

People are often caught up in the existing conditions, rather than looking forward to future conditions. Lengthy discussion centered on the important issues and components for the upcoming regional workshop. Attendants expressed interest in a presentation and discourse about landslides in the region, both geologically induced and caused by storm events and inundation. Panel discussions should be flexible and allow for each municipality to choose a topic of their choice, as long as the focus remains on integrating future conditions into the planning process.

Next steps will focus on preparation for the regional workshop in March; however a deeper look into analyzing survey and research results was also discussed. Laura Grape and Justin Rolfe-Redding expressed interest in a collaborative comparison between GMU CCC's research and NVRC's homeowner survey results. Additionally, further discussion about the components of NVRC's forthcoming advisory report will be necessary in the future. Regarding the regional workgroup, further work on the agenda appears to be necessary, resulting in a draft agenda to be shared with each municipality. A date and location have also yet to be determined, but attendants suggested a doodle poll to decide upon the date—either March 19th or 29th. Laura Grape will send out the poll and look into possible locations for the workshop.

Condensed Meeting Notes:

I. "The Six Americas and Beyond: Audience Analysis Research for Communicating about Climate Change" [Justin Rolfe-Redding, GMU]
   - Concerned and cautious categories constitute the bulk of the population.
   - Need to tailor messages about climate change to the groups based on their views.
   - Most people (43%) somewhat disagree that they have felt the effects of climate change personally.
   - Values (individualism and egalitarianism) might be a viable method of approaching climate change values. People use their values as a filter; they don't always use the facts to make up their minds about an issue.
   - Key to communication: *Use simple, clear messages, repeated often, and by a variety of credible sources.*

II. Survey of Northern Virginia Waterfront Property Owners Summary [Laura Grape, NVRC]
   - People are more concerned about existing conditions than future conditions.
   - There is potential to do a comparison of the survey results between GMU CCC and NVRC (Justin Rolfe-Redding and Laura Grape).
   - Need to use openness and transparency. Need to make the issues socially visible because a lot of them are easy to ignore. Need to make the issue "real" on the personal level and emphasize the hopeful solutions.
   - Once social infrastructure is established, the same framework can be used for other issues.
   - Community support is important. Need people to understand the "why."
   - Rally supporters. Neutralize deniers. Focus on the broad middle. Don't get caught up in the dismissive ones. Some people, due to values, will never be convinced. However, it is also very important that everyone feels included and is given a chance to be heard, or else they are likely to resist the process.

III. Activity Updates and Project Recap [Laura Grape, NVRC
   - Recommended Report Components:

  - Infrastructure losses/economic implications would give localities more help in requesting funds
  - Staging/phasing of recommended priorities based on type of infrastructure
- Laura G. wants to continue discussion of important components of NVRC's advisory report at a later date. It is important that this report is a useful resource for the localities.

IV. Regional Workshop Discussion [Frank Dukes, IEN]

- Need to identify barriers to integrating future conditions into the planning processes in Northern Virginia, and the particulars for each County.
- Need to address the terminology being used that will be effective to spur involvement of citizens and policymakers.
- Reviewed Straw Man Agenda, with lengthy discussion about the panel.
- It may be helpful to have a condensed presentation by Justin Rolfe-Redding, GMU on "The Six Americas and Beyond: Audience Analysis Research for Communicating about Climate Change"
- Both geology and rain seem to be issues with regard to landslides in the region.
- DCR's flood plain program. It could be possible to have a few staff members come to talk and address these issues and community assistance options. DCR could also participate in the small group discussions. Use them as a tool to formulate solutions. It might be more valuable to have the DCR program staff to make a presentation. (Though this idea went unresolved… At what point is this information useful? Before or after identification of the problems?)
- Center for Watershed Protection/Center for Climate Strategy mentioned as potential speakers/participants
- First, determine where communication has broken down in the planning process. Then, what are the tools for localities? Craft panel discussions based on the identified solutions that might actually be possible. Municipalities have different problems, but the reason for the problem might be universal. Our goal should be to make sharing between municipalities easier.
- Should be open to new topics if any county had a different topic it would like to present. We should be willing to change these "set" topics as long as the same range/breadth is covered.
- Does anyone outside of Northern Virginia have a new perspective or advice for useful solutions? DCR, Virginia Beach listening sessions report, CWP, Center for Watershed Studies, Washington COG
- Local planning staff to be primary participants
- Discussion about the date for the workshop: March 19th or 29th? Attendants decided upon a doodle poll to decide the date. Laura to send out. Respond ASAP. Need to work on a location.
- Next steps: Date and location. Draft agenda, review for terminology.

Appendix B

LOOKING BACK TO LOOK FORWARD WORKSHOP

"Looking Back to Look Forward"

Workshop

Fairfax County Government Center, Conference Room 4-5

April 23, 2012

AGENDA

9:00 – 9:30 a.m. **Registration and Refreshments**

9:30 **Welcome, Introductions, Purpose of Meeting, Agenda**

Participants will have an opportunity to introduce themselves. The workshop sponsors will share background on the effort, including the Sustainable Shorelines Project.

9:45 **Local Jurisdictions Impacts, Barriers and Tools**

A panel of local government representatives will discuss topics ranging from floodplain issues, large storm events, to stormwater systems. Panelists include:

Don Demetrius, Fairfax County DPWES – Stormwater Planning Division

Questions:

- What impacts is each jurisdiction seeing from climate-related events?
- What barriers are there to integrating future conditions in the planning processes in Northern Virginia as a whole and in your jurisdiction?
- What tools and solutions are available to make use of in these situations?
-

10:30 **DCR's Floodplain Management Program – Alison Meehan, DCR**

10:50 **Break**

11:00 **Introduction of case studies: Belle Haven and Huntington**

11:15 **Case Study Discussion – Belle Haven**

Participants will learn about the flooding that occurred in the Belle Haven community during hurricane Isabel. This area is identified as a hot spot through the Sustainable Shorelines project for future inundation due to sea level rise and storm surge.

- 45 minutes in small groups
- last 15 minutes discuss in whole group

12:15 p.m. **Lunch**

1:15 **Case Study Discussion – Huntington**

Participants will learn about the flooding that occurred in the Huntington community during the June 2006 storms and Tropical Storm Lee, in September 2011.

- 45 minutes in small groups
- last 15 minutes discuss in whole group

2:15 **Next Steps**

- Focus: Do you see new tools and solutions that are viable for your jurisdictions?
- Common themes and solutions that emerged from discussions

2:30 **Conclude**

Sustainable Shorelines Workshop

Looking Back to Look Forward

April 23, 2012

Fairfax County Government Center

Executive Summary:

The "Looking Back to Look Forward" workshop on April 23, 2012 focused on the challenges to communicating and planning for the effects of climate-related storm events with the broader public and with local policymakers in Northern Virginia. Representatives from Fairfax and Prince William Counties, the City of Alexandria, the U.S. Fish and Wildlife Service, Virginia Department of Conservation and Recreation, the U.S. Army Corps of Engineers, Metropolitan Washington Council of Governments, and Virginia Department of Transportation were present. Discussions were framed around two case studies in Fairfax County, the Belle Haven and Huntington communities, which are two "hot spots" of flooding impacts in the County. A presentation by Virginia DCR focused on methods of flood damage mitigation through higher regulatory standards imposed through floodplain ordinances.

Barriers and current issues concerning planning for flooding, sea level rise and storm surges associated with climate change seem to be primarily due to lack of funding for mitigation projects and the impacts to the existing communities. Options for wall or berm construction as well as buy-out of structures in the floodplain are very costly, and caused unwanted impacts to community members, including visual and economic losses due to mitigation strategies, and loss of the community itself through potential displacement. Related issues include distrust on the part of community members toward local government actions, and the lack of a standardized baseline for risk management for localities to use when establishing regulations. Lastly, competition for funds is a problem, as most stormwater-related funding goes towards TMDL projects.

Possible tools for dealing with these identified problems include strengthening regulations for future development and retrofits in the floodplain, including the implementation of higher standards in floodplain ordinances. Standardization of a baseline risk management level was identified as a needed component of future planning, but participants acknowledged the difficulty of implementation. Community charrettes and education will help determine community priorities and levels of acceptable risk. Stronger data with less reliance on debatable models is needed for working with local governments to get planning project approval. This data gathering could be part of the next steps for the Sustainable Shorelines Workgroup. There appears to be interest in the continuation of this work, and a possible opportunity for further grant funding.

Meeting Notes

Introduction

Laura Grape posed these questions to consider throughout the workshop:

- As these communities (from the two case studies) plan for the future, what does this suggest we need to consider?
- How do you feel your community should approach making changes to facilitate being more prepared?
- What areas should be prioritized? How do we move forward?

Roundtable Discussion

Don Demetrius provided an overview of the two case studies ("hot spots"): Huntington and Belle Haven communities in Fairfax County. Highlights follow:

Belle Haven/Belleview

- The community is already located in the floodplain, and probably floods about every 10-25 years, when the Potomac River rises over 7 feet. Considering sea level rise, it will probably occur more frequently.
- The most recent flooding occurred in 2003.
- The current approach is possibly to build a 6600 ft wall, costing about $30 million.
- There are 3 distinct communities in Belle Haven:
    - The south end includes 3 high-rise towers.
    - Belleview Condos/garden apartments include some people living below ground. Here there are significant impacts already.
    - In New Alexandria, most are above the current 100-year level. In a few years these may be subject to flooding.
- Identified issues related to the Belle Haven community include the following:
    - The number of people and homes cause any major changes to be difficult.
    - Buy-outs are *not* feasible due to costs. Is it even acceptable if it *were* feasible?
    - With regards to protection, what can you do that doesn't cause problems in other areas?
    - The public meetings have been well attended thus far. Some residents want protection and others do not. They do not want to lose their views to the River and do not want negative impacts of protection on their property. There are also issues with visual impacts of mitigation strategies.
    - The biggest issue is funding. If it does not meet the USACE cost-benefit ratio, the County must pay for all of it.

Huntington

- The neighborhood floods about every other year due to Potomac River and Cameron Run tidal effects. Sea level rise is probably less of an issue here.
- The worst-case scenario for sea level rise corresponds with the 100-year flood.
- Buy-outs are more feasible here than in Belle Haven, as it has very affordable homes.
- Identified issues related to the Huntington community include the following:
    - Residents are not happy with the idea of moving, if buy-out is the decided solution.
    - The construction of a sea wall did not meet the USACE cost-benefit ratio. The wall proposal was a grass berm about 2500 feet in length, and in the $30 million range.
    - A wall or berm might cause drainage problems upstream.
    - With regards to buy-out, in 2006 it would have been about $100 million for a complete buy-out. Today, there is probably about a 30% drop in price. Do the value of the houses warrant that type of expenditure? That is a lot of money to take out of the tax base. It is also a loss of a community. Most residents do not want the buyout, but some do.
    - The biggest issue is funding.
    - There is also a social aspect to the issue. This is a settled community. The residents think it is the County's problem, and that the locality should have done something about the issues. This is because

the majority of development in the County predated many floodplain requirements. A common sentiment is the distrust of County motives; how can this perception be changed? The County wants higher-income properties but these affordable homes near Metro are a rarity.

- Possible options for Huntington include:
    - Intensified redevelopment along Huntington Avenue, which may cause natural relocation of residents in the floodplain.
    - Opportunity for a public-private partnership? The Fairfax County Comprehensive Plan wants high-density mixed-use TOD. Concentrate development outside the impact area, and leave the impact area alone.

Responses from other organizations and localities in attendance included the following:

- Alexandria has also seen an increase in high intensity storms.
- Prince William County has a lot of older communities, and a lack of stormwater control caused by ordinary storm events (not including climate change effects).
- Parks are losing shoreline. Park closures due to storm damage are costly. Mudslides cause the destruction of historic resources. Flooding in neighboring communities affect parkland and cause water to drain through refuges.
- VDOT has experienced damage to infrastructure, which leads to road closures, wiped out bridges, and dislocation of pipes.

Participants addressed issues and barriers, including the following comments:

- The costs for action can be substantial, running to tens of millions of dollars. When is mitigation or prevention cost effective or cost beneficial?
- What can one do with existing communities that are at risk for flooding from storm surge, or flooding in general? People downstream *want* to be located there. Is it possible to move people out of the floodplain? The costs of a buyout or elevation of homes can be enormous. Many people question whether it is appropriate for the government (i.e., taxpayers) to make home improvements such as elevating a home.
- How can one determine to what extent these are problems related to climate change (compared to simply normal storm events)? Many participants noted that severe storms are more commonplace than they were in recent decades.
- We probably cannot engineer our way out of this. Should we? We need to consider the costs.
- What happens to long-standing communities when full development is not allowed due to concerns over increased flood damage?
- Developers often don't understand the maintenance aspect of stormwater BMPs. For example, Prince William County has received pushback from developers on these regulations. There is quantity control (inches of retention requirements), but little quality control.
- There is no standard policy or requirement at any government level for mitigation up front that would lessen pushback.
- There is generally a lack of both public education and effective public policy.
- Generally, identified barriers to planning for sea level rise include discrepancies with models and dealing with and determining levels of risk management.

Ideas for possible tools and solutions included the following:

- Use FEMA grants and VDEM grants.
- Special exception processes can be used for infill, such as "allowing but accommodating" full development in existing communities. An example of this would be to allow infill with freeboard requirements.
- Education for developers about the new stormwater regulations could be helpful. A lot of them are outsiders with no stake in the community.
- There may be a possibility to use a staged approach, and increase wall heights over time.

- Localities ask for a baseline for risk management. (USGS might be a organization to lead this.) This could be used as a starting point for federal agencies to adopt.
- Beyond hard shorelines, alternatives include increased freeboard for new construction and buy-out of below-grade apartment units

DCR National Flood Insurance Program Presentation: "Using Higher Standards for a Safer Today AND a Safer Tomorrow," Alison Meehan of Virginia's Department of Conservation and Recreation presented about their floodplain program (she offered to make the powerpoint program available upon request).

- Community Participation
    - This is a voluntary program, a contract between FEMA and the local government.
    - The locality adopts FIRM and enforces the floodplain management ordinance.
- Minimum Requirements include:
    - Adoption of zones from FEMA studies and maps.
    - Permitting through regulation of everything that goes in the floodplain.
- Localities need to encourage higher standards due to damage in spite of minimum standards because:
    - There are errors in mapping, and the maps do not include sea level rise. Additionally, the maps use 100-year storm levels from 30 years ago.
    - Floods can exceed the 100-year storm.
    - Urbanization increases flood damage.
    - Erosion issues and subsidence are not included in the maps.
- Higher Regulatory Standards are possible through Floodplain Ordinances. The following are examples of higher standards that can be implemented:
    - Freeboard: lifting the lowest floor higher than the BFE (base floor elevation). This lowers insurance rates.
    - Cumulative Substantial Improvement: When the monetary value equals 50% of the value of the structure in a 5-year period, the entire structure must be brought into compliance.
    - BFE determinations: This is a loophole in Federal regulations. It requires knowledge of the BFE before new development occurs in A zones.
    - Determine floodway before development.
    - No rise in floodplain: This calls for zero development in the floodplain (no hydraulic or hydrologic impacts).
    - Enact V-zone regulations for A-zone construction.
    - Additional floodplain zones: These are regulations based on sea level rise inundation zones. They include the study and map areas not shown on the FIRMs.
    - Setbacks: These can be modeled after the Chesapeake Bay Act, which restricts development 100 feet from the edge of the Bay.
    - Enforcement vs. Regulation: Localities need to enforce higher standards and include all enforcement policies in the regulations.

The main takeaway from the presentation is that a proactive approach to floodplain management is needed.

Next steps and considerations:

Frank Dukes posed the following questions:

- What political, social, economical, and/or environmental issues should be considered?
- How should areas and next steps be prioritized?

The highlights of the discussion of these questions are as follows.

- There are competing uses for funds: Prince William County has been focused on the new Chesapeake Bay and local TMDLs, which take up a lot of CIP money. Therefore, they are driving a lot of the decisions based on whether a project receives TMDL credit. This inhibits quality control.
- VDOT and Fairfax have experienced the same funding TMDL issues as well.
- Is there a need to look at IDF curves in other jurisdictions when building or retrofitting facilities? There is a need to consider future footprints.
- Other climate change impacts:
    - Public health is affected due to standing water and flooding.
    - Water temperatures are increasing.
    - Parks are experiencing new levels of pests, the effects of the ash borer, and changed forest makeup.
- There is a need for a planning measure to establish a particular level of goals. This would provide something for the public to engage with by highlighting personal impacts—a more comprehensive approach.

What are the options to move forward with this project? Is there more for the Sustainable Shorelines Workgroup to do?

- We may need additional data that does not rely on models. More real, pragmatic numbers are helpful when presenting ideas to local governments. We should look *backward* to see what changes have already happened and use these numbers to project forward to see how it is trending. Existing information is very powerful.
- We need a group effort and we do need to think on a regional scale.
- Is there a benefit of community charrettes to deal with the localized issues described in the case studies? This includes education and addressing options for these areas, as well as elevation determination. The outcome would inform a regional discussion to achieve a range of elevations, perhaps. There is also a need to determine how much risk a community is okay with, and that will be the basis for a decision on elevation.
- There is a possibility for a continuing grant with Virginia CZM to continue this work.

Attendees:

Elfatih Salim, DPWES Stormwater
Lauryn Sacha, VA DCR – State Parks
Clay Morris, Prince William County – Watershed
Greg Weiler, FWS – Potomac River NWRC
Amanda Daisey, FWS – Potomac River NWRC
Amanda Campbell, MWCOG
Noel Kaplan, Fairfax County – DPZ
Stacey Underwood, USACE
John Muse, VDOT
Brian Rahal, City of Alexandria
Alison Meehan, VA DCR
Mary Ann Welton, Fairfax County – DPZ
Don Demetrius, Fairfax County DPWES Stormwater
Laura Grape, NVCC
Todd Janeski, VCU

Facilitaiton and recording:
Frank Dukes, U.Va. – IEN
Laura McCoy, U.Va. – IEN
Melissa Keywood, U.Va. – IEN
Leigh Knudsen, GMU – SCAR

Looking Back to Look Forward Workshop - April 23, 2012

Name	Organization	Email Address
Aimee Vosper	NVRC	avosper@novaregion.org
Christopher Landgraf	Ft. Belvoir	christopher.landgraf@us.army.mil
Claudia Hamblin-Katnik	City of Alexandria - OEQ	Claudia.Hamblin-Katnik@alexandriava.gov
Emily Baker	City of Alexandria	emily.baker@alexandriava.gov
Brian Rahal	City of Alexandria	brian.rahal@alexandriava.gov
Erica Bannerman	City of Alexandria - EcoCity	erica.bannerman@alexandriava.gov
Clay Morris	Prince William County	cmorris@pwcgov.org
Patty Dietz	Prince William County	pdietz@pwcgov.org
Ray Utz	Prince William County - Long Range Planning	rutz@pwcgov.org
Tom Dombrowski	Prince William County Wetlands	tdombrowski@pwcgov.org
Don Demetrius	Fairfax County DPWES - Special Projects	donald.demetrius@fairfaxcounty.gov
Fred Rose	Fairfax County DPWES - Stormwater Planning	fred.rose@fairfaxcounty.gov
Noel Kaplan	Fairfax County DPZ	noel.kaplan@fairfaxcounty.gov
Mary Ann Welton	Fairfax County DPZ	maryann.welton@fairfaxcounty.gov
Fred Krimgold, PhD	VA Tech - Advanced Research Institute	krimgold@vt.edu
Jeff Harn	Arlington County - DES	jharn@arlingtonva.us
Jess Lowry	DCR - Mason Neck State Park	jess.lowry@dcr.virginia.gov
Greg Weiler	US FWS - Occoquan Complex	greg_weiler@fws.gov
Lauryn Sacha	DCR - State Parks	lauryn.sacha@dcr.virginia.gov
Karen Lambey	DCR - Leesylvania State Park	karen.lambey@dcr.virginia.gov
Randy McBride, PhD	GMU - Coastal Geomorphology	rmcbride@gmu.edu

Chris Jones, PhD	GMU - PEREC	rcjones@gmu.edu
Todd LaPorte, PhD	GMU - Long term Governance	tlaporte@gmu.edu
Justin Rolfe-Redding	GMU - Center for Climate Change Comm.	jrolfere@gmu.edu
Ed Maibach	GMU - Center for Climate Change Comm.	emaibach@gmu.edu
John Muse	VDOT - District Environmental Manager	john.muse@dot.virginia.gov
Maia Davis	MWCOG - Climate Adaptation	mdavis@mwcog.org
Dale Medearis	NVRC	dmedearis@novaregion.org
Dale Morris	Dutch Embassy	dale.morris@minbuza.nl
Janneke deVries	Dutch Embassy	janneke-de.vries@minbuza.nl
Julia Koster	NCPC	julia.koster@ncpc.gov
Doug Curtis	US NPS - Urban Ecology Center	doug_curtis@nps.gov
Ben Helwig	US NPS - GWMP	ben_helwig@nps.gov
Claudia Cruise	Town of Occoquan	occoquantownhall@aol.com
Iris Tharp	Town of Quantico	mayor@townofquantico.org

Appendix C

APA MIDATLANTIC REGIONAL ROUNDTABLE AGENDA

8th Mid-Atlantic Regional Planning Roundtable

Real World Challenges: Water, Energy and Transportation Intergovernmental Planning to Solve Complex Problems

March 30, 2012 – Arlington, Virginia

Hosted by: Northern Virginia Regional Commission &

Virginia Tech Department of Urban Affairs – National Capital Region

Organized by: Regional and Intergovernmental Planning Division, American Planning Association

Approved AICP Recertification Credits---5.0

Co-sponsored by:

APA Chapters: Delaware, Maryland, National Capital Area, Pennsylvania, Virginia

And: Baltimore Metropolitan Council, Delaware Valley Regional Planning Commission Hampton Roads Planning District Commission, Maryland State Department of Planning Metropolitan Washington Council of Governments, Wilmington Metropolitan Area Planning Council, and the Virginia Association of Planning District Commissions

Agenda

8:30 a.m. Registration and Continental Breakfast

9:00` - Introduction – Terry Holzheimer, FAICP, Chair, APA Division Council

Director, Arlington Economic Development

Welcome -- G. Mark Gibb, Executive Director, Northern Virginia Regional Commission

9:15 -10:30 - Panel 1 – Energy Challenges: Increasing Efficiency, Managing Cost, Supporting Economic Growth, Engaging Citizens and Employers - Locally and Regionally

This panel will show ways to incorporate energy issues into local planning processes through adoption of community energy plans. These plans assess the amount of energy our communities are using today and set goals to reduce energy and related environmental impacts and increase energy security. The panel will share lessons from Northern Virginia and the US Department of Energy's Community Energy Strategic Planning Academy.

Moderator – Dale Medearis, Senior Environmental Planner, NVRC

1) NVRC Regional Energy Strategy and Community Energy Planning in Northern Virginia – Stephen Walz, Northern Virginia Regional Commission

2) Arlington Community Energy Plan; Integrating with the County Comprehensive Plan – Rich Dooley, AICP, Community Energy Coordinator, Arlington County Department of Environmental Services

3) ***U.S DOE, Community Energy Strategic Planning Academy*** **–** Sarah Zaleski, Policy Advisor, Office of Weatherization & Intergovernmental Program, US Department of Energy, Washington DC

4) ***Discussion***

10:30 – 10:45 – Break

10:45 -Noon - Panel 2 - The Challenges of Water Management and Coastal Mitigation: The Dutch and American Experiences

Mr. Brack Bentley, former Town Manager, Vienna and Front Royal, Virginia put the fundamental water problem for public managers this way: "Water - there's either too much, or not enough, and in

the wrong place." This panel addresses collaborative approaches used for low-lying/sea-level communities that manage both storm water drainage and external storm surge intrusion. Government, the private sector and the research community need to work side by side to develop new technologies, strategies and policies that meet today's water challenges, utilizing all relevant experience to deal with extreme weather events. Case studies at the international, national and regional levels will be presented, including lessons from the Dutch Delta Programme as are being applied in New Orleans and Florida. Work is underway at both the Metropolitan Washington Council of Governments regional scale and that of the Northern Virginia Regional Commission, all within the Mid-Atlantic's Chesapeake Bay watershed which is under influence of the Atlantic Ocean and its seasonal storms.

Moderator – Aimee Vosper, ASLA, PLA, Director, Planning and Environmental Services, NVRC

1) Delta Programme Water Management Knowledge for U.S. Coastal Areas –

a) Dale Morris, Senior Economist, Dutch Embassy

b) Pex Langenberg, Senior Dutch representative from the Netherlands Ministry of Transport, Public Works and Water Management

2) Adaptation Planning - Water Resources and Coastal Protection - Increasing community resiliency to risks of extreme weather events at regional scales.

a) Laura Grape, Senior Environmental Planner, Northern Virginia Regional Commission

b) Maia Davis, Environmental Planner IV, Metropolitan Washington Council of Governments

3) ***Discussion***

Noon – Lunch and Networking Time - Alex Bond, AICP, 1st Vice-Chair, Regional and Intergovernmental Planning Division , ICF International – Announcements

12:45 -2 pm Panel 3 – Transportation Challenges – How can transportation planning be integrated from the local level to regional to state? The Virginia solution.

The Office of the Secretary of Transportation is responsible for eight agencies effecting transportation in the commonwealth. The Virginia Office of Intermodal Planning and Investment was created in 2002 to encourage the coordination of multimodal and intermodal planning across these various transportation modes. A 2035 VTrans policy plan was developed through a multimodal Transportation Working

Group with representatives from the Transportation Secretariat. In addition, the Virginia Department of Transportation (VDOT) and Virginia Department of Rail and Public Transportation (DRPT) developed the 2035 Virginia Surface Transportation Plan (VSTP), which provides long-term multimodal transportation suggestions for the commonwealth. The plan provides information for potential long-term project development and investment based on the goals identified in VTrans2035, Virginia's statewide multimodal transportation policy plan. The Surface Transportation Plan received the APA Virginia Chapter – 2011 State Planning Innovation Award. Included in the VSTP are recommendations from 20 Regional Rural Long Range Plans that identify needs based upon goals and objectives established by each region using a unique process with local stakeholders.

Introduction – Tom Christoffel, AICP, FeRSA – Regional/Greater Community Development News

1) **Moderator -** Marsha Fiol, State Transportation Planner, Virginia Department of Transportation

2) **2035 VTrans, the Commonwealth of Virginia's statewide long-range multi-modal transportation plan** - Dironna Belton, Office of Intermodal Planning and Investment

3) **2035 Virginia Surface Transportation Plan -** Brad Shelton, AICP, Statewide Highway Plan Project Manager, Virginia Department of Transportation, and Amy Inman, Manager of Transit Planning, Department of Rail and Public Transportation

4) **Regional Long Range Plan Development -** Elijah Sharp, Regional Transportation Planner, New River Valley Planning District Commission (Blacksburg-Radford)

5) ***Discussion***

2:00-2:15 -- Break

2:15 to 3:45 - Panel 4 – Integrated Planning Working Regionally in the Mid-Atlantic

Panel member will report on key challenges for their localities and the program responses of their agencies

Moderator--Lee Schoenecker, AICP, Past Chair, Regional and Intergovernmental Planning Division

1) **Maryland Department of Planning: PlanMaryland and Some of Its Relationships**

Richard B. Josephson, AICP, Director of Planning Services

2) Metropolitan Washington Council of Governments: Region Forward Implementation: Regional Activity Centers, and Equity Considerations

Paul DesJardin, Director of the Department of Community Planning and Services

3) Baltimore Metropolitan Council: Regional Plan for Sustainable Development

Mike Kelly, General Counsel and Government Relations Coordinator

4) Delaware Valley Regional Planning Commission: Greater Philadelphia's Connections Framework with Emphasis on the Eco-Economy

Mary Bell, PP, Manager of Demographics and Economic Analysis

5) Hampton Roads Virginia: Strategic Challenges and Opportunities

John M. Carlock, AICP, Deputy Executive Director

3:45 to 3:50 – Closing Session – Future steps – discussion - Alex Bond, AICP, 1st Vice-Chair, Regional and Intergovernmental Planning Division, ICF International

4:00 Post Conference Networking Social – The Green Turtle – Street level

Parking: Pay tickets on P-1 level when exiting – cash/credit machine

Speaker and Moderator Bios by Panel

Panel 1 – Energy Challenges: Increasing Efficiency, Managing Cost, Supporting Economic Growth, Engaging Citizens and Employers - Locally and Regionally

Moderator – Dale Medearis

Mr. Medearis is Senior Environmental Planner for the Northern Virginia Regional Commission. He previously served as Program Manager for Europe at US EPA Office of International Affairs from 1995 – 2007. He received a BA in International Relations from the University of Redlands in 1986 and recently, a Ph.D., Environmental Design and Planning, Virginia Polytechnic Institute and State University.

1) Stephen Walz

Mr. Walz, as the Director, Regional Energy Planning for the Northern Virginia Regional Commission, works with Northern Virginia local governments to implement local and regional energy and sustainability plans to achieve transformational reductions in energy use and provide increased energy security. Mr. Walz also serves on the boards of the Local Energy Alliance Program and the Greater Washington Region Clean Cities Coalition. Previously, Mr. Walz served as the Director of the Virginia Department of Mines, Minerals and Energy through January 2011, and Senior Energy Policy Advisor to Virginia Governor Tim Kaine from 2007 through January 2010.

Mr. Walz served at DMME for over 30 years including directing the agency's Divisions of Energy and Administration. Mr. Walz served on numerous energy and related groups including Chairman of the Governor's Energy Policy Advisory Council, The Governor's Climate Change Commission, the Commission on Energy and Environment, the Virginia Coastal Energy Research Consortium Board, the Energy Advisory Council to the Appalachian Regional Commission, and the State Hazardous Materials Emergency Response Advisory Council. Prior to joining Virginia state government, Mr. Walz worked in energy and community development programs in Missouri and Nebraska for the Black Economic Union of Greater Kansas City, Catalyst & Associates, and the Central Missouri Counties Human Development Corporation. He has a BS in Civil Engineering from Worcester Polytechnic Institute in Worcester, Massachusetts. Mr. Walz along with Ms. Vosper, served as the host team to organize the 8th Mid-Atlantic Roundtable meeting.

2) Rich Dooley, AICP

Mr. Dooley is the Community Energy Coordinator for the Arlington County Department of Environmental Services. His current duties include ensuring that all stakeholders' voices are heard when it comes to shaping Arlington County's energy future coordinating with the Community Energy Plan (CEP) project's team. In addition, he leads the effort to create a new Energy element for the County's Comprehensive Plan plus an Implementation Plan for the CEP. He previously worked at the NAHB Research Center as a Green Building and Land Use Specialist and at SAIC as an Environmental Consultant. Rich holds two Masters Degrees in Public Affairs (MPA) and Environmental Science (MSES) from Indiana University's School of Public and Environmental Affairs.

3) Sarah Zaleski

Ms. Sarah currently serves as a Policy Advisor for the U.S. Department of Energy's Energy Efficiency & Renewable Energy Office. Sarah has worked on energy and sustainability policy at multiple jurisdictional levels. Regionally, she was involved in the first sustainability initiative in Teton County, Wyoming. At the state level, she designed and marketed energy demand side management programs for government and utility sponsored initiatives in North Carolina; and internationally, Sarah assessed implications of expanding global biofuel markets while with the United Nations Conference on Trade and Development. Before joining the DOE in June of 2010, Sarah worked for the City of Baltimore where she helped establish their Office of Sustainability. In this role, she worked on a range of projects including the creation of the Baltimore Sustainability Plan, the City's original green building requirements, the City's greenhouse gas emissions inventory, and multiple other initiatives. Sarah received a BS in Industrial and Labor Relations from Cornell University and both a Masters of Environmental Management and a Masters of Public Policy from Duke University where her research focused on developing a labor/environmental alliance to support clean energy policies.

Panel 2 - The Challenges of Water Management and Coastal Mitigation: The Dutch and American Experiences

Moderator – Aimee Vosper, ASLA, PLA

Ms. Vosper serves as Director of Planning and Environmental Services for the Northern Virginia Regional Commission. A licensed Landscape Architect for over 26 years, develops and manages the work of one of NVRC's major divisions responsible for regionally-significant planning, environmental and related issues. Prior to her position with NVRC, Ms. Vosper was the Division Chief, Park Planning and Development for the City of Alexandria Department of Recreation, Parks and Cultural Activities for more than six years. Her role in City government was considered essential to the development of partnerships both internally and externally. Her private practice experience in land planning and smart growth development contribute to her responsibilities in advocating new directions in land planning in Northern Virginia. Ms. Vosper holds a Bachelor of Environmental Design in Landscape Architecture from NCSU College of Design. Ms. Vosper along with Mr. Walz served as the host team to organize the 8th Mid-Atlantic Roundtable meeting.

1) a) Dale Morris

Mr. Morris is Senior Economist at the Royal Netherlands Embassy in Washington, DC, providing economic and political analyses of US macro-economic, fiscal and monetary policy, as well as US federal budget, tax and appropriations developments. Morris directs the Dutch Government's Water Management network in the United States, and in particular in Louisiana, Florida and California. This effort is primarily focused on broad "sustainability" topics: flood protection and flood risk mitigation, coastal and floodplain restoration, water supply/conveyance in areas of water duress, ecosystem resiliency, adaptation, urban water management, and landscape design for risk reduction and environmental/public amenity. Morris is co-director of Dutch Dialogues and serves on the New Orleans Water Management Strategy Advisory Council. Morris previously served as Legislative Director and Press Secretary for two Members of the U.S. Congress and was responsible for budget, tax, trade, appropriations, entitlements and energy/environment issues. Morris was honorably discharged from the US Air Force and is a graduate of the University of Pittsburgh and the University of Virginia.

b) Pex Langenberg

Mr. Langenberg is currently the Counselor for Transportation and Water Management for the Royal Netherlands Embassy. From 2002, he held the position of Director Public Transport Policy, Ministry of Transport, Public Works and Water Management. Within the City of Amsterdam, he was the Manager, Traffic and Transportation Division from 1998-2002. From 1994-1998 Mr. Langenberg held the position of Deputy Mayor for Traffic and Transportation in the City of Leiden, The Netherlands. After graduating from the University of Leiden with a degree in Political Science in 1984, he was the Policy Advisor, in the Ministry of the Interior, The Netherlands, for 10 years.

2) a) Laura Grape

Ms. Grape is Senior Environmental Planner for the Northern Virginia Regional Commission. She received a BS in biology from George Mason University in 2000. From 2001 to 2006 she served as Ecologist II for the Fairfax County Department of Public Works and Environmental Services. In July, 2006 she took the position of Senior Environmental Planner at the NVRC. Major projects include: Four Mile Run Watershed Management Program and Urban Stream Restoration, Cameron Run Watershed Restoration and Feasibility Study with the United States Army Corps of Engineers, Northern Virginia Conservation Corridors; Green Infrastructure

Planning, and Sustainable Shorelines and Community Management; Adaptation Strategies for Local Response to Sea Level Rise. She received a George Mason University Graduate Certificate for Environmental Conflict Resolution and Collaboration in 2011.

b) Maia Davis, Environmental Planner IV, Metropolitan Washington Council of Governments

Ms. Davis is an Environmental Planner IV at the Metropolitan Washington Council of Governments working on climate, energy and air quality. She previously was with the Atlanta Regional Commission (ARC) as a Principal Environmental Planner where she was the program manager for ARC's Green Communities Program and the Metro Water District's Water Supply and Water Conservation Management Plan. In 2006, Maia earned a Masters Degree from Georgia Institute of Technology in City and Regional Planning with specializations in Environmental Planning and Geographical Information Systems. She earned her Bachelor's of Science from the University of Maryland Eastern Shore.

Panel 3 – Transportation Challenges – How can transportation planning be integrated from the local level to regional to state? The Virginia solution.

Introduction – Tom Christoffel, AICP, FeRSA

Mr. Christoffel is the editor and publisher of the weekly Regional/Greater Community Development News which tracks the emergence of regional community approaches in the U.S. and around the world. Mr. Christoffel was named a fellow of the Regional Studies Association in 2011. He hold a Master of Urban Affairs degree from Virginia Tech. He worked for Northern Shenandoah Regional Commission from 1973 until his retirement in 2008. He served in several positions including Senior Planner and Executive Director. Along with Mr. Paul DesJardin, he organized the first Mid-Atlantic Regional Planning meeting in 2005.

1) Marsha Fiol

Ms. Fiol is a State Transportation Planner in the Transportation and Mobility Planning Director fopr the Virginia Department of Transportation (VDOT). Fiol has served as Program Manager for the Rural Transportation Planning Program, as Section Manager for the Statewide Policy and Planning Section and as a representative on the Commonwealth's Multimodal Advisory Committee. She also served as Assistant Division Administrator for Policy and Planning in VDOT's Transportation and Mobility Planning Division prior to taking on the position of Administrator of the Transportation and Mobility Planning Division. She has a Bachelor of Business Administration with a minor in Finance from Austin Peay State University in Clarksville, Tennessee and a Masters of Science in Transportation Policy, Operations and Logistics from George Mason University, School of Public Policy in Arlington, Virginia.

2) Dironna Moore Belton

Ms. Belton, is the Multimodal Transportation Specialist for the Virginia Office of Intermodal Planning and Investment. She joined the Commonwealth of Virginia a year ago to enhance the statewide multimodal planning processes through innovation, interaction with the Secretary of Transportation and coordination with the agencies of the Secretariat and regional MPOs. She has previously worked for the Tennessee Department of Transportation as a Transportation Planner for the Multimodal (Rail/Waterways/Public Transportation) Division

and for the TDOT Environmental Division; as well as held the position as Zoning Administrator for the City of Petersburg Department of Planning and Community Development in 2005. She holds a B.S. from Virginia Tech 01' and later received advanced graduate studies in Urban and Regional Planning from Virginia Commonwealth University 05'. Ms. Belton has over seven years experience in planning.

3) a) Brad Shelton, AICP

Mr. Shelton is the Statewide Highway Plan Project Manager for VDOT's Transportation and Mobility Planning Division. Over the last five years, Brad has been responsible for leading an interdisciplinary team in the development of the highway element of the 2035 Virginia Surface Transportation Plan. He has also performed work in the areas of transportation policy, functional classification, and access management and has served as a member of the Multimodal Advisory Committee responsible for developing VTrans2035. Prior to joining VDOT, Brad worked as a principal planner for Goochland County, VA and as a transportation planner for Montgomery County, PA and the Richmond Area MPO. He holds an undergraduate degree in Urban Studies and a Master's of Urban and Regional Planning, both from Virginia Commonwealth University and is a member of the American Institute of Certified Planners.

b) Amy Inman

Ms. Inman serves as Manager of Transit Planning for the Virginia Department of Rail and Public Transportation. In this capacity, Inman oversees all transit planning efforts for the agency. Her contributions to the development of statewide plans, such as VTRANS 2035 and Virginia's Surface Transportation Plan, have ensured the creation of multi-modal plans to guide Virginia's long-range transportation development. Her work on the Hampton Roads Regional Transit Vision Plan helped a geographically complex region identify short- and long-term transit recommendations that support existing land use plans and provide key connections to deliver a regional transit system that can meet the diverse needs of the region. Prior to joining DRPT, Inman worked as a Senior Planner and Project Manager with the Indianapolis Metropolitan Planning Organization. She holds a B.S. from Indiana University and M.S. in Bio-Geography and Urban Planning from the University of Illinois. Ms. Inman is speaking on the Transportation Challenges panel immediately following lunch.

4) Elijah Sharp, Regional Transportation Planner, New River Valley Planning District Commission (Blacksburg-Radford)

Mr. Sharp Currently manages the annual Rural Transportation Work Program at the New River Valley Planning District Commission. As a Regional Transportation Planner, he has gained experience in the areas of: regional prioritization of transportation projects, roadway safety and congestion, public transportation, bicycle, pedestrian, freight movement, access management, maintenance of traffic, hazard mitigation, and land use. Elijah currently contributes staff time and leadership to a variety of local, regional, and statewide planning efforts. Elijah graduated in 2006 from Bluefield State College, West Virginia, with degrees in Architectural and Civil

Engineering Technology. After working for nearly 3 years as a civil engineer, he joined the PDC in 2009 as a Regional Planner.

Panel 4 – Integrated Planning Working Regionally in the Mid-Atlantic

Moderator - Lee Schoenecker, AICP

Mr. Schoenecker is the immediate Past Chair of the APA Regional and Intergovernmental Planning Division, and was also on the APA National Capital Area Chapter Board for 10 years. At present, he is also on the Greater Washington 2050 Coalition, an organization put together by the Metropolitan Washington Council of Governments to develop long range goals and targets for the National Capital Region. He is a retired federal employee, having worked for both the U.S. Office of Management and Budget in intergovernmental relations and with the U.S. Air Force in the Pentagon on both base expansions and closures. He also worked for ten years in local and state governments. He has been a primary advocate and organizer for the Mid-Atlantic Regional Planning Roundtables since 2007 when the Division became involved.

1) Richard B. Josephson, AICP

Rich Josephson currently serves as Director of Planning Services for the Maryland Department of Planning, where he is responsible for overseeing planning assistance to local governments, land and water resource planning, infrastructure planning and implementation of the State's first sustainable growth plan. Prior to his employment with the State, he served as Deputy Director for the City of Alexandria, Virginia, Department of Planning and Zoning. He has also served as a planner, Zoning Administrator and Comprehensive Planning Administrator for the Office of Planning and Zoning in Anne Arundel County, where he directed a major update to the County's General Development Plan and was responsible for preparation of 16 small area community plans. He received a Bachelor of City Planning degree from the University of Virginia, is a member of the American Institute of Certified Planners (AICP) and a member of the Maryland Chapter of the American Planning Association.

2) Paul DesJardin

Mr. DesJardin is the Director of the Department of Community Planning and Services (DCPS) for the Metropolitan Washington Council of Governments (COG) -- the regional organization of the Washington area's major local governments, plus area members of the Maryland and Virginia legislatures, the U.S. Senate, and the U.S. House of Representatives. Mr. DesJardin is responsible for directing the Department's technical and policy work in regional planning; land use/transportation and TOD-related studies; regional economic analysis and demographic forecasting; affordable housing and foreclosure; and foster care/child welfare. Mr. DesJardin and DCPS are lead policy and technical staff to several key COG committees including the Region Forward Coalition, Planning Directors Technical Advisory Committee, Housing Directors Advisory Committee, and the Capital Area Foreclosure Network (CAFN). Mr. DesJardin is a member of the American Planning Association, National Capital Area Chapter; the co-chair of CAFN; a member of the PNC Bank Community Development Advisory Board; a member of the Community Council of WAMU-FM radio; and a member of the vestry of St. Peter's in the Woods Episcopal Church in Fairfax Station. Mr. DesJardin was awarded a Master's in Urban and Regional Planning from the College of Architecture and Urban Studies of Virginia Tech, and has more than 20 years of professional

planning experience. Along with Mr. Christoffel, he helped organize the first Mid-Atlantic Regional Planning meeting in 2005.

3) Mike Kelly

Mr. .Kelly serves as General Counsel and Governmental Relations for the Baltimore Metropolitan Council. A graduate of Loyola University and the University of Baltimore School of Law, Mike handles legal matters for the Council and coordinates cooperative efforts among the Baltimore region's jurisdictions. Among Mike's other duties are managing special projects for the Council's Board of Directors, which is comprised of the Mayor of Baltimore City and executive officials from surrounding jurisdictions. Before joining the Council, Mike served as defense counsel for a large insurance company, managed numerous Baltimore City political campaigns and worked as a case manager in a transitional home for homeless men. Mike has been a member of the Mother Seton Academy Board of Directors since 2007 and is a past president of the Loyola University alumni association.

4) Mary E. Bell

Ms. Bell is the Manager of Demographic and Economic Analysis at the Delaware Valley Regional Planning Commission (DVRPC). Her current responsibilities include organizing and analyzing population, housing, and economic data to support the Commission's regional land use and transportation planning activities. In 2011, Ms. Bell co-authored The Mismatch between Housing and Jobs, an assessment of the location, condition, and affordability of housing throughout Greater Philadelphia and a comparison of housing location to employment, infrastructure, and the regional transportation network. Ms. Bell is also the primary staff person responsible for the Greater Philadelphia Economic Development Framework, Greater Philadelphia's regional Comprehensive Economic Development Strategy (CEDS). Ms. Bell has been at DVRPC for almost 24 years and worked previously for Cherry Hill Township, New Jersey, where she managed the local housing programs and assisted with the preparation of the local Master Plan and NJ COAH housing plan. She holds a Bachelor of Arts in Geography from the University of Delaware and a Master's Degree in Urban and Regional Planning from Virginia Commonwealth University.

5) John M. Carlock, AICP

Mr. Carlock is Deputy Executive Director for the Hampton Roads Planning District Commission. He has been with the Commission and its predecessor, the Southeastern Virginia Planning District Commission, since 1973. In his position, Mr. Carlock manages the HRPDC Economics, Emergency Management, Housing, Public Information and Community Affairs, Regional Planning and Water Resources Programs. He is a member of the American Water Works Association and the Association of State Wetland Managers. He is also an Affiliate Member of the American Society of Landscape Architects. Mr. Carlock serves on a number of state, federal and local government advisory committees. He has directed or authored many technical and policy studies and plans. He served as Chairman of the Virginia Recycling Markets Development Council during 2000 and 2001. Mr. Carlock has a B.S. from Illinois State University and a Master of Science in City and Regional Planning from Southern Illinois University at Edwardsville.

Prior Roundtables

Mid-Atlantic Regional Transportation Planning Coordination Roundtable
October 21, 2005 – Lord Fairfax Community College, Middletown, Virginia
Mid-Atlantic Regional Planning Roundtable - II
February 17, 2006 - 400 N. Capitol St, NW, Hall of the States - Washington, D.C.
The U.S. Mid-Atlantic Super-Region -
Mid-Atlantic Regional Planning Roundtable – III
December 8, 2006 - Baltimore Metropolitan Council – Baltimore, Maryland
4TH Mid-Atlantic Regional Planning Roundtable
Taking Smart Growth to the Regional Level - 3.0 - Region to Region Cooperation
November 9, 2007 - George Washington Regional Commission
University of Mary Washington, N.S. Campus - Fredericksburg, Virginia
5th Mid-Atlantic Regional Planning Roundtable
Multi-Regional, Multi-State Solutions: Transportation, Land Use and Environmental
November 7, 2008 - Delaware Valley Regional Planning Commission (DVRPC) - Philadelphia, Pennsylvania
6th Mid-Atlantic Regional Planning Roundtable
Smart and Sustainable – Local & Regional, State and Multi-State - How will planning contribute to achieving these goals of the citizenry?
September 30 – October 1, 2009 - Metropolitan Washington Council of Governments (MWCOG) Frederick, Maryland
7th Mid-Atlantic Regional Planning Roundtable
Sustainable Regions: States and Localities Working Regionally in the Mid-Atlantic
September 30 – October 1, 2010 – WILMAPCO - Wilmington Area Planning Council Wilmington, Delaware
Start up support 2006-7: *Association of Metropolitan Planning Organizations (AMPO), National Association of Development Organizations (NADO), National Association of Regional Councils (NARC)*

On-line history and past programs
http://semanticommunity.info/Mid-Atlantic_Regional_Planning_Roundtables

Appendix D

DUTCH EMBASSY WORKSHOP AGENDA AND FINAL REPORT

Kingdom of the Netherlands

With climate change a reality, seas rising steadily and more superstorms predicted, communities in the US and Europe must adapt to the deluge of floodwaters on the horizon. But what can we do? Please join us as we discuss these issues in a special dialogue between the Royal Netherlands Embassy and the Northern Virginia Regional Commission: "Climate Adaptation Planning: Local Level Strategies for US Communities."

AGENDA

Climate Adaptation Planning:
Local-Level Strategies for US Communities

January 14, 2013
9:00AM to 2:30PM
Royal Netherlands Embassy - 4200 Linnean Avenue, NW - Washington, D.C. 20008

Goal and Context: This conference has four goals:

1) To share innovative climate adaptation approaches from the Netherlands that have been applied successfully in the US;
2) To present new climate adaptation planning practices proposed for the US, with a particular focus on the State of Virginia, at regional and local levels
3) To stimulate meaningful place-based (local- and regional-level) climate adaptation planning in Virginia;
4) To highlight the economic, environmental and social benefits derived from US/NL cooperation on a variety of climate adaptation policies.

PROGRAM

8:30 am **Registration and Refreshments**

9:00 am **Introduction**

Peter Mollema, Vice-Ambassador of the Royal Netherlands Embassy
Janneke de Vries, Counselor for Spatial Planning and the Environment, Royal Netherlands Embassy
Martin Nohe, Chairman, Northern Virginia Regional Commission

9:30 am **Keynote address**

Karen Arpad, Sectoral Manager Water, Province North-Holland

9:45 am **Questions and Answer**

9:50 am **Panel Discussion**

The Experience of Implementing Dutch Climate Adaptation Policies in the US

The recent developments around Hurricane Sandy have underlined the importance of being prepared for the effects of climate change. Since 2005, primarily in response to the vulnerabilities exposed by Hurricane Katrina, a handful of US communities are forming concrete, problem-focused and goal-oriented strategies adapted from the Netherlands. Water infrastructure policy at the national and sub-national level is oriented around 10,000 year storm events (for primary levees). In the Netherlands, climate adaptation planning is seamlessly integrated into land-use, transportation, water infrastructure and urban policies. This panel will share how and why US cities and regions found and applied climate adaptation lessons from the Netherlands and how their success can extend to the work taking place in Virginia.

Moderator:
Dale Morris, Royal Netherlands Embassy

Speakers:

Suzan van Kruchten, Province North-Holland
Peter Wijsman, Arcadis
David Waggonner, Waggonner & Ball Architects

11:00 am **Coffee Break**

11:15 am **Panel Discussion**

Climate Adaptation Planning in Virginia: The Next Frontier in Transatlantic Lesson Learning

According to the 2008 Virginia Governor's Commission on Climate Change, rising sea levels and severe storm events emanating from climate change present a very significant economic, human health, environmental and national security threat to Virginia. This panel will look at those threats and their consequences and explore how Northern Virginia can learn from the climate adaptation lessons of the Netherlands. This panel will host a range of policymakers, scientists and non-governmental representatives to share policy and technical recommendations (data collection and mapping), stormwater policies (on-site stormwater management), and integrated infrastructure planning that might find application.

Moderator:

Juliet Eilperin, The Washington Post

Speakers:

Jay Fisette, Member, Arlington County Board
Laura Grape, Executive Director, Northern Virginia Soil and Water Conservation District
Todd LaPorte, Associate Professor, School of Public Policy, George Mason University
Frank Lowenstein, Climate Adaptation Strategy Leader for The Nature Conservancy's Global Climate Change Team

12:20 pm **Panel Wrap-up**

Dale Medearis, Northern Virginia Regional Commission

12:30 pm **Buffet lunch**
Opening of Buffet Lunch

1:00 pm **Introduction of US Representative Gerry Connolly**

Mark Gibb, Executive Director, NVRC

1:05 pm **Remarks by US Representative Gerry Connolly**

1:25 pm **Q & A, with speakers, panelists and audience**

2:00 pm **Closing Remarks & Recommendations**

Juliet Eilperin, The Washington Post

2:05 pm **Adjourn**

Climate Adaptation Planning:
Local-Level Strategies for US Communities

NVRC Project Report to the Royal Netherlands Embassy
February 25, 2013

Project Report Summary

The Northern Virginia Regional Commission and the Embassy of the Kingdom of the Netherlands organized a joint one-day dialogue January 14, 2013 to discuss the exchange and application of mutually beneficial and innovative climate adaptation policies. Over 100 scientists, researchers, technical and policy experts, academicians, NGO officials and elected officials (national, state and local level) met at the Embassy for the "Climate Adaptation Planning: Local Level Strategies for US Communities" conference. The participants reviewed national and sub-national climate adaptation approaches from the Netherlands, particularly the Province of North Holland. They heard about case studies concerning US cities, such as New Orleans and the California Central Valley, in which Dutch climate adaptation policies were evaluated and adopted – leading to resiliency and economic development in those regions of the US. The audience heard how Northern Virginia actively and systemically applies innovative urban sustainability lessons from European regions, including climate adaptation policies from the Netherlands, and represents the next step in this model transatlantic conversation.

Peter Mollema, Vice-Ambassador of the Royal Netherlands Embassy, and Janneke de Vries, Counselor for Spatial Planning and the Environment, Royal Netherlands Embassy, and NVRC Chairman Martin Nohe, Chairman, kicked off a review of the unique collaboration that has evolved between the Netherlands and NVRC. Starting in 2012, NVRC hosted Suzan van Kruchten, a technical research expert from the Province of North Holland who reviewed multiple technical and policy climate adaptation innovations and the opportunities to transfer them from the Netherlands to Northern Virginia. Suzan's work and the subject of resilient cities was discussed on a panel consisting of Suzan, Karen Arpad (Sectoral Manager Water, Province North-Holland), Pete Wijsman (Arcadis), and David Waggonner (Waggonner & Ball Architects). The panel also looked into Dutch climate adaptation policies and the experiences of New Orleans in applying those innovations, especially in 2012 after Hurricane Isaac.

Juliet Eilperin from the Washington Post facilitated a discussion with Jay Fisette, Member, Arlington County Board, Laura Grape, Executive Director, Northern Virginia Soil and Water Conservation District, Todd LaPorte, Associate Professor, School of Public Policy, George Mason University, and Frank Lowenstein, Climate Adaptation Strategy Leader for The Nature Conservancy's about how these lessons from the Netherlands can find application in Northern Virginia.

Congressman Gerry Connolly concluded the conference with a keynote speech and reaffirmed the need to learn from the Dutch experiences with creating resilient cities. He addressed the value of coordinated policy and technical exchange between the federal and local governments.

Three core themes emanated from the conference panels and speeches:

- The Dutch are global technical and policy pioneers with climate adaptation;
- Balancing green and gray infrastructure variables in the climate adaptation equation is vital to successful adaptation strategies at the local and regional level;
- Climate adaptation is a very complex and technical subject. What works in the Netherlands requires thoughtful investment of time and effort to understand how these apply to US regions such as New Orleans or Northern Virginia. But it can be done and there are economic, environmental and social benefits to be realized in the US as a result of this structured conversation across the Atlantic.
- NVRC is a US pioneer in developing problem-focused, goal-oriented and continuous policy transfers of innovations with European cities and regions that strengthen Northern Virginia.

Appendix E

PRESENTATIONS FROM PARTNERS ON ADAPTATION AND OUTREACH

SPATIAL PLANNING & WATER

SUZAN VAN KRUCHTEN, M.SC.

SHORT INTRODUCTION OF MYSELF

- B. Sc. in Public Administration (Erasmus University, Rotterdam)

- M.Sc. in Decision-making and Management of Complex Spatial Planning Projects

  Master Thesis: Sacramento- San Joaquin Delta, California.

  Organized a conference in San Francisco attended by >100 professionals from California and the Netherlands.

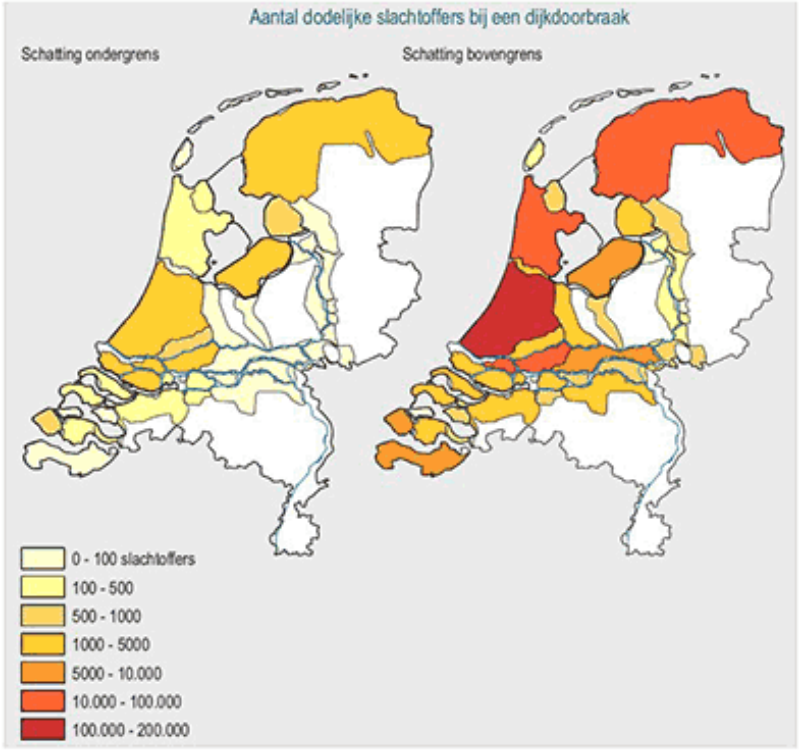
- Since 2010 :policy advisor for the province North-Holland

  Urban Water, International Water Week

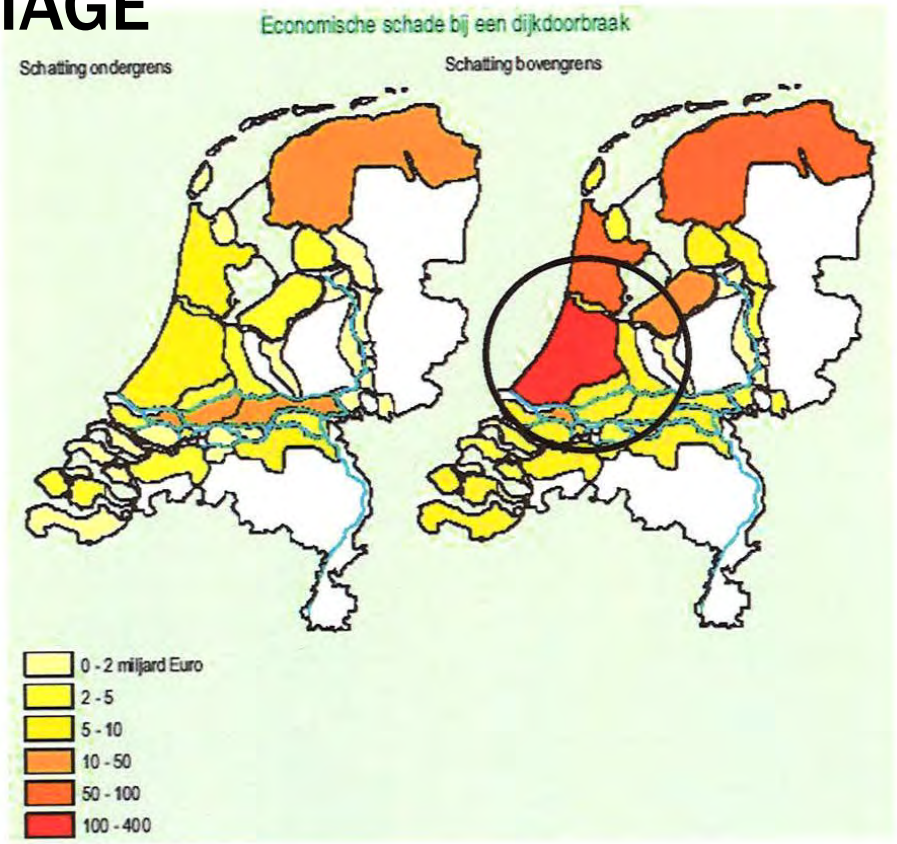
THE DUTCH DELTA

General statistics	
Surface area	21,218 sq.mi / 33,948 km^2
Population	16.66 million
GNP/capita	€ 34,661
Main water system	
Coast line	400 mi (642 km)
Dykes/dams	292 mi (e.g. Afsluitdijk 20 mi)
Lake IJsselmeer	500,000 acre / 2500 acre-feet
Banks	1,682 mi (2706 km)
Weirs	16
Storm surge barriers	4
Liable to flooding	59%

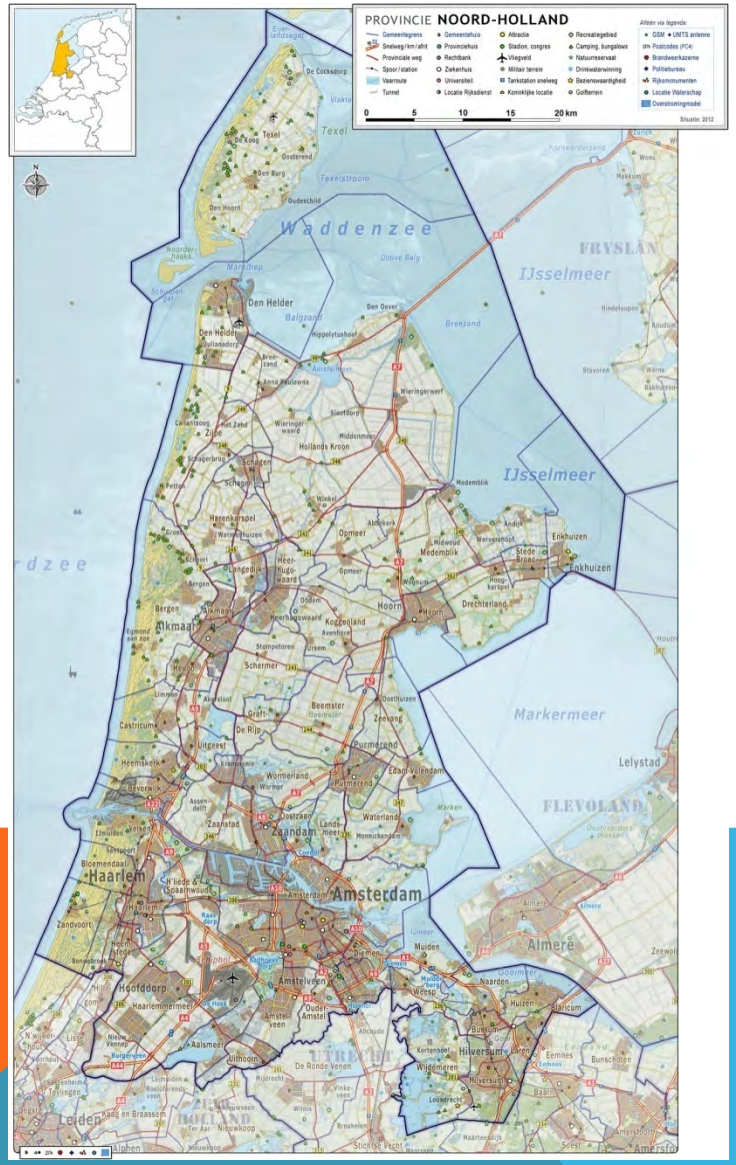
SAFETY RISK: BENEFIT; FLOOD RISK, LOSS OF LIFE *AND* ECONOMIC DAMAGE



Figuur 7.2.7 De schatting van het aantal dodelijke slachtoffers bij overstroming per dijkringgebied: boven- en ondergrens.

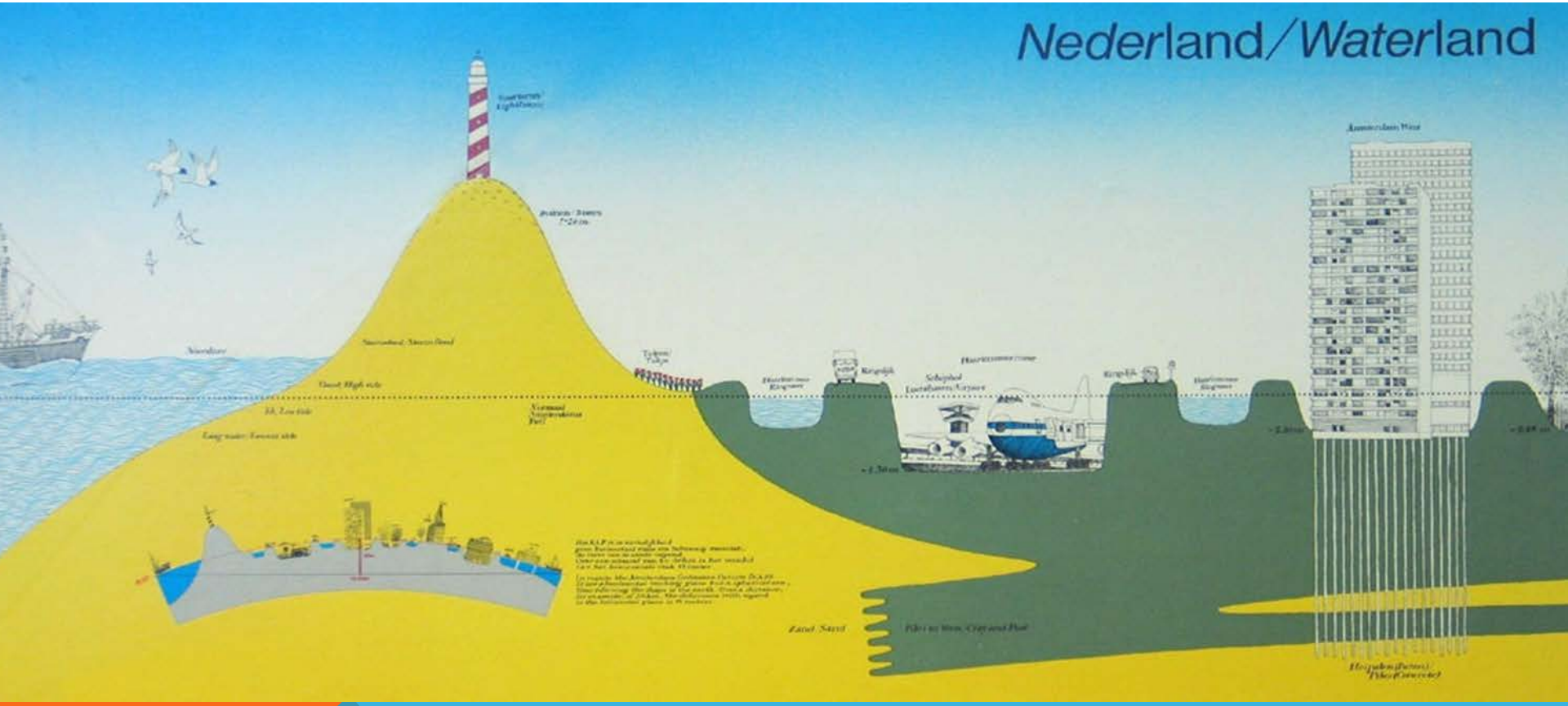


NORTH-HOLLAND

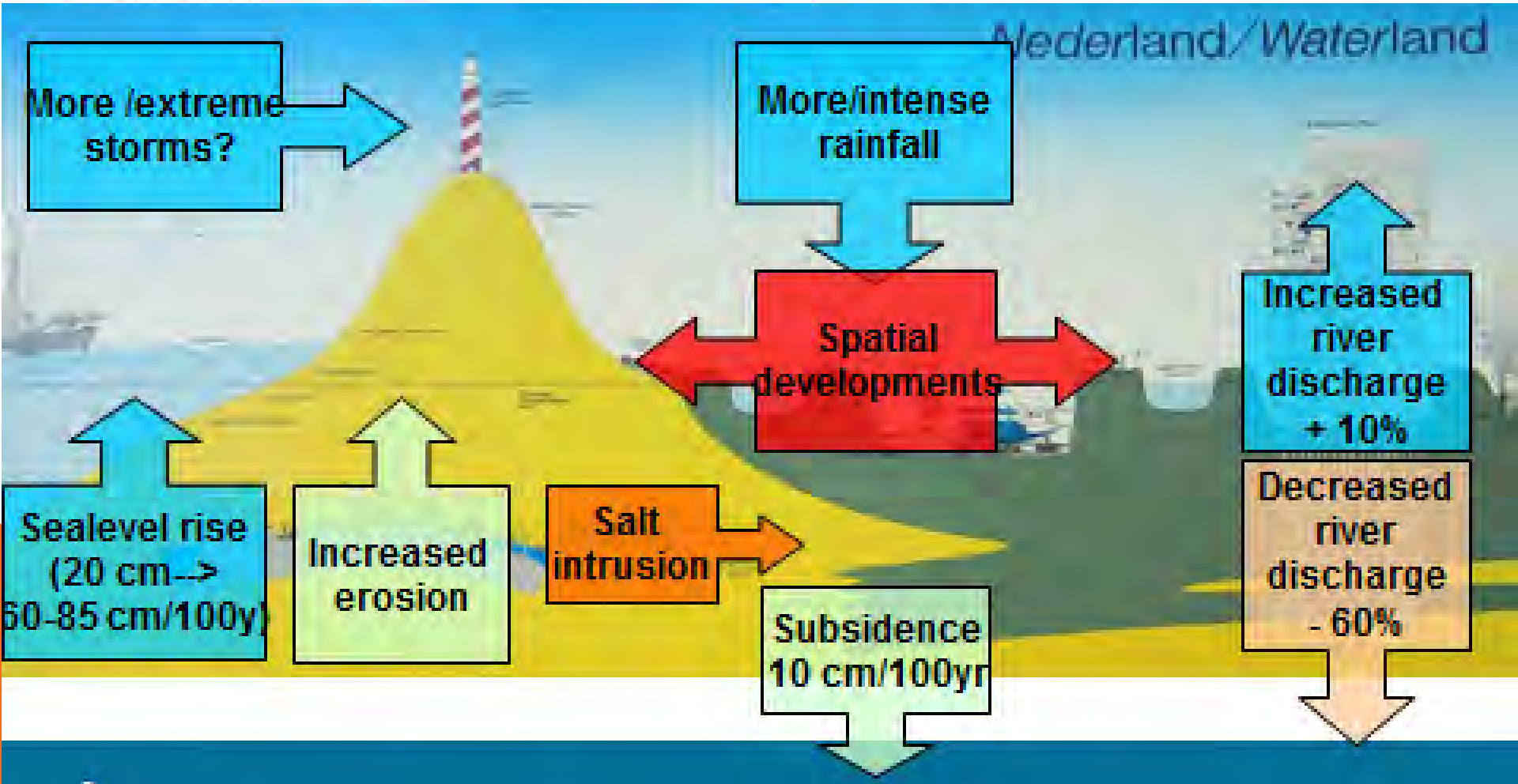


Anno 1520

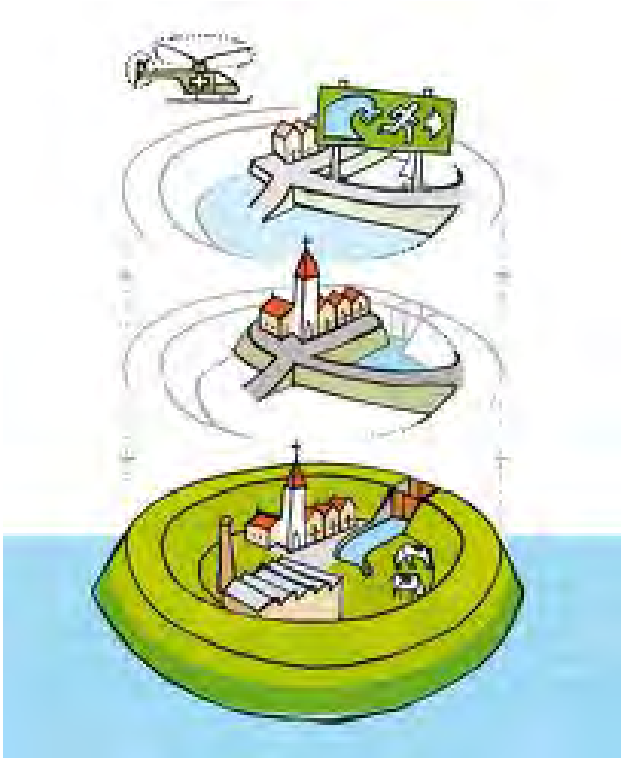
THE NETHERLANDS; WATERLAND



The Delta Under Pressure: future challenges, measured



MULTILAYER SAFETY



Layer 3: Emergency planning

Layer 2: Sustainable Spatial Planning

Layer 1: Prevention of flooding

NATIONAL PROGRAMMES

- Delta Programme
- Room for the River

DELTA PROGRAMME

AN INNOVATIVE APPROACH: DELTA PROGRAMME

- **Delta Programma is aimed at keeping NL a good, safe and attractive place to live and work**

- **Two goals, three values**
  - Safe now and in the future [2050-2100]; being prepared
  - Fresh water supply guaranteed also in dry periods
  - Solidarity, flexibility, sustainability
- **For the people and the economy**

- **Not as an answer to a disaster, but in advance, to be prepared and avoid it**
- **Delta Fund (€1 billion/year)**
- **Adaptive delta management**

MULTIGOVERNMENTAL PROCESS

Government collaboration in program teams, in order to:

- Joint fact finding
- Collect creative and innovative ideas
- Combine with local developments
- Involve stakeholders / interest groups and built acceptance

Supervised by Delta Programme Commissioner

progress, uniformity, coherence, transparency

present rolling on Delta Program / proposal to Government

ROOM FOR THE RIVER

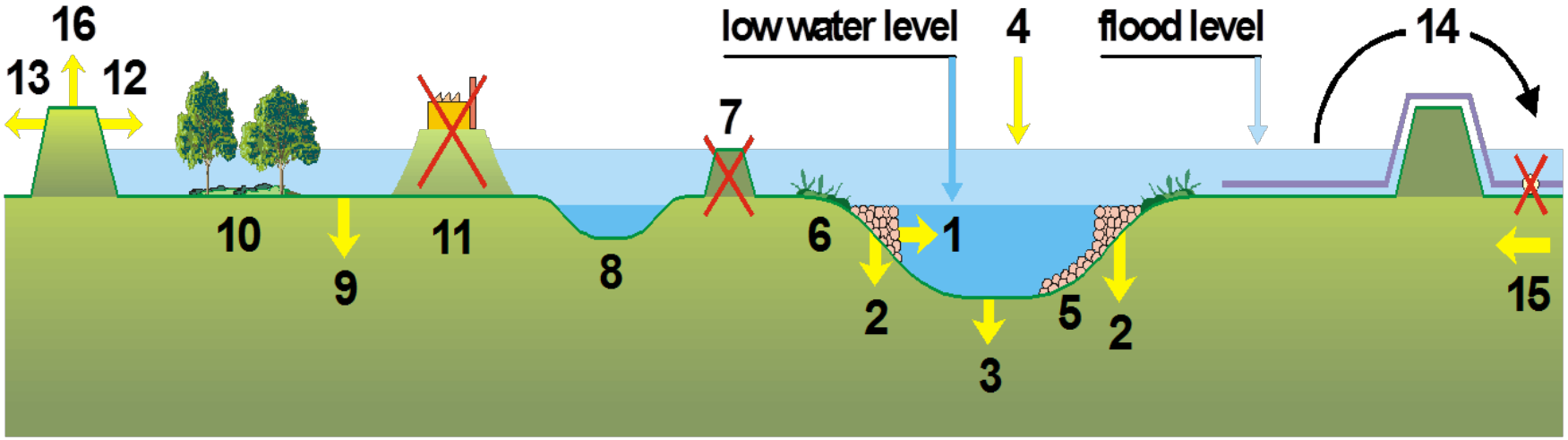
- **Design discharge increase (for 2050), from 15.000 m3/s to 16.000 m3/s, is *insufficient*, given climate change**
- **Projected need:18,000 – 20,000 m3/s by 2100;**
  - 1995 flood: 12,500 m3/s
- **Heightening / reinforcing embankments is costly ($1.7 billion / 2050), and will likely increase overall risk**

- **From *flood resistance* to *flood accomodation***
- **Reduce projected increase in design discharge levels**
- **Dike heightening only as a last resort**
- **Flood management and spatial quality (enhancing natural and cultural landscape values); design teams led by local govt.**

- **RvR began as idea in 1986, gained momentum in 1990s, US projects as inspiration**

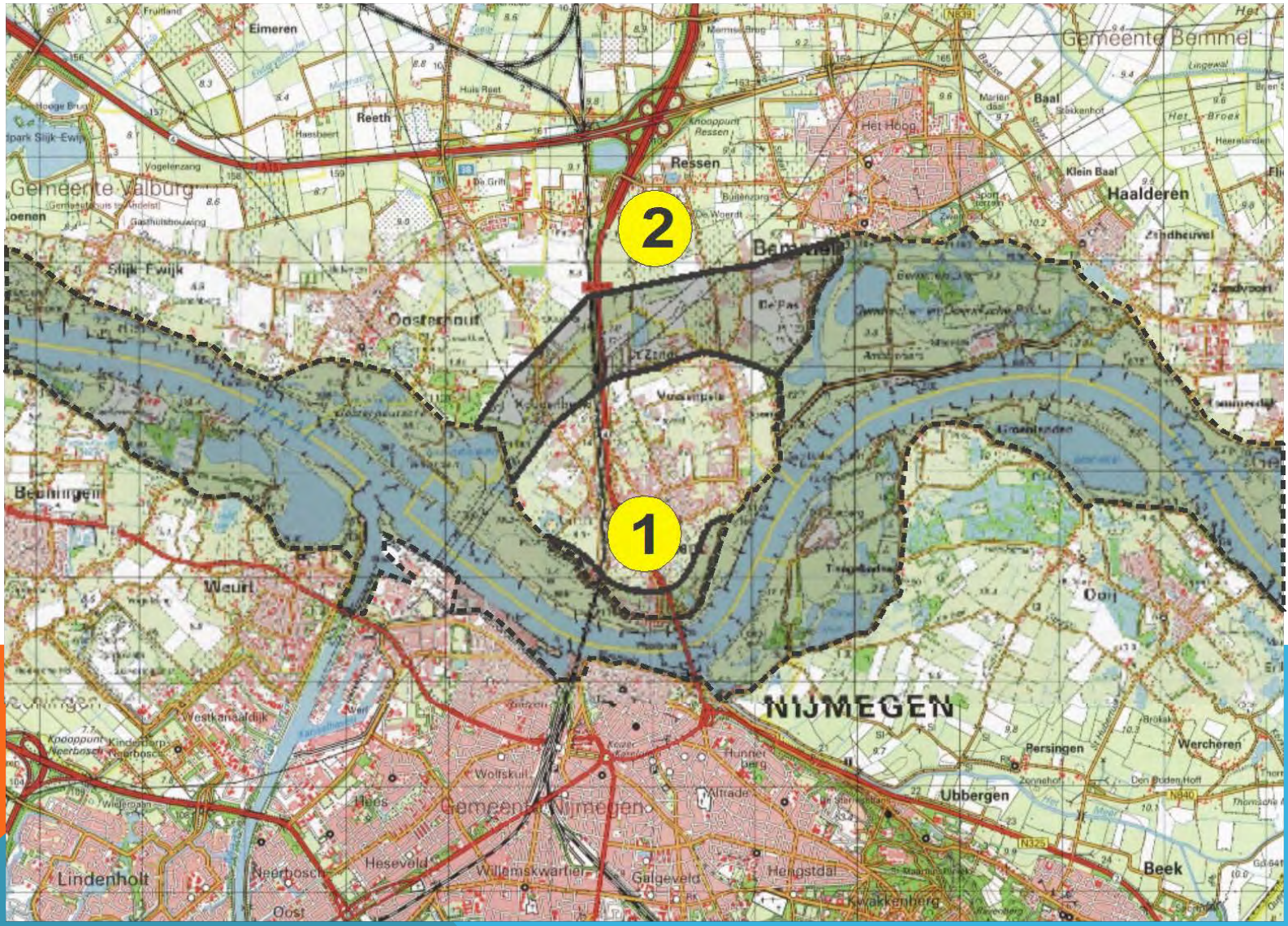
NATIONAL PROGRAMME

ROOM FOR THE RIVER



1 - narrowing of main channel
2 - lowering of groyne
3 - dredging
4 - dumping of sediment
5 - permanent layer
6 - natural bank
7 - removing of summer embankment
8 - secondary channel
9 - lowering of flood plain
10 - nature development
11 - removing of high-water free areas
12 - dike reinforcement
13 - dike repositioning
14 - retention
15 - obstruction of lateral flow
16 - dike raising

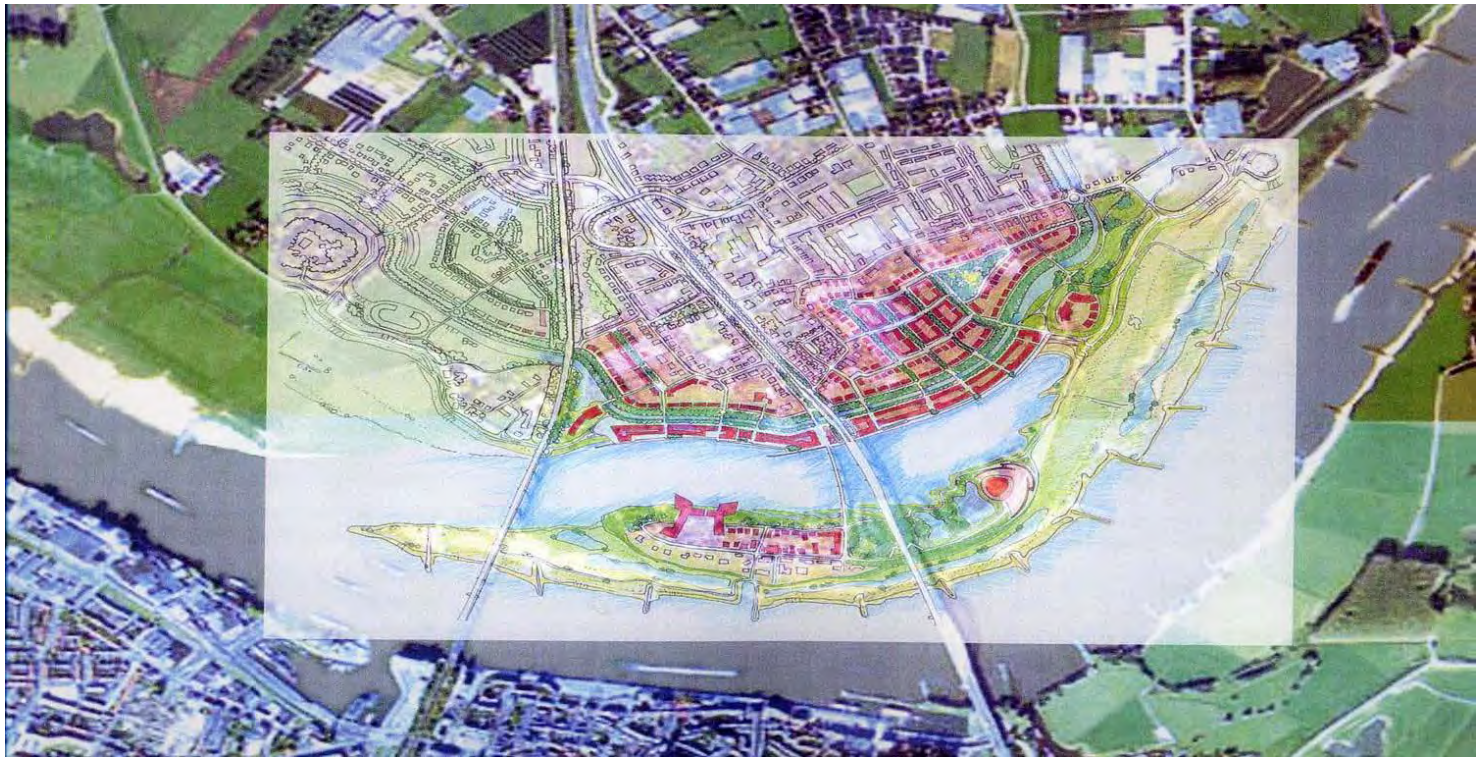
TWO SCENARIOS



DIKE SET-BACK STRATEGY: SAFETY, INCREASED STORAGE / FLOW CAPACITY, AND NEW LAND OPPORTUNITIES

BEFORE AND AFTER

NEW SPATIAL QUALITY, COMMERCIAL/RESIDENTIAL DEVELOPMENT



THE ROOM FOR THE RIVER
PLANNING TOOLKIT

- Large amounts of river data collected and put inside the “black box”
- Field of play: hundreds of kilometers of river reaches
- Data was smoothed/made consistent, and toolkit model was to generate local and system-wide impacts
- 700 possible measures/actions (type and scope) identified by experts/stakeholders; each individually modelled
- A-ha! Many alternative strategies are conceivable for improving flood protection for the medium term

WHAT MAKES/MADE THE PLANNING KIT A USEFUL TOOL?

- Forms a common knowledge base
- Supports and facilitates learning, rivers form a *system*
- Enlarges knowledge of local, regional river management
- People can check the relevance of their own ideas about flood management
- Sense of empowerment: users understand process and science

- Simple to use
- Complete overview of measures
- Easy to distribute among stakeholders

ROOM FOR THE RIVER; LESSONS

- Retain, Store, Discharge
- Emergencies (national, local) yield opportunities; "strike while the iron is hot," acknowledge implementation takes time
- Combining protection and spatial quality creates broader public support for measures: environmental, economic, safety
  - "And…and" not "either…or"
- Transparency and directness about goals, ackowledge trade-offs at beginning of process
- Allow local stakeholders to guide (many partners)
- Offer many possible options
- More time in awareness / planning yields better, quicker implementation
- Toolkit is key to create shared knowledge
- Steady, reliable, dedicated project funding lowers overall costs

The Dutch Embassy

4200 Linnean Avenue NW

Washington, DC 20008

Janneke de Vries, Counselor of Housing, Spatial Planning & Environment

Janneke-de.vries@minbuza.nl

Dale Morris, Economic Department

Dale.Morris@minbuza.nl

Suzan van Kruchten, province North-Holland

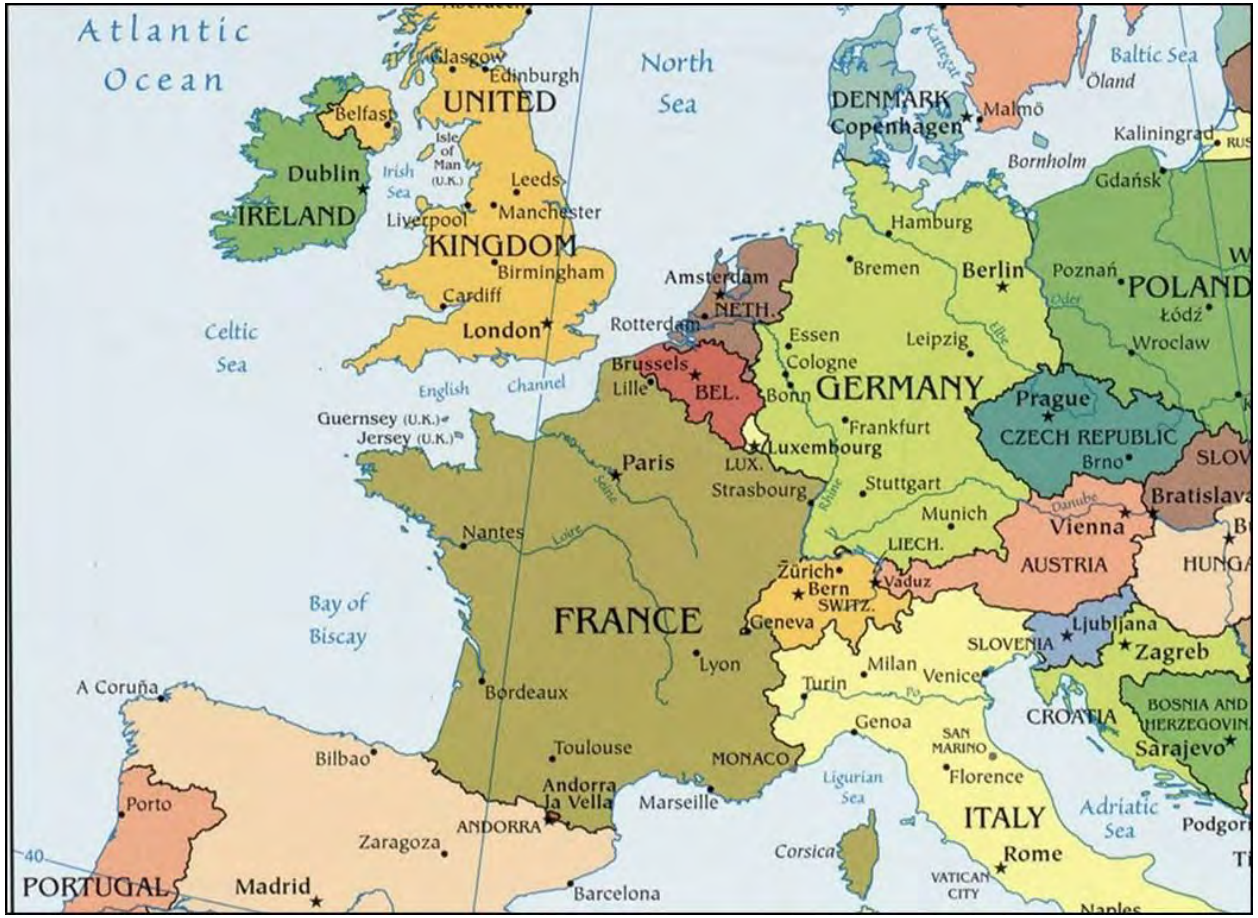
kruchtens@noord-holland.nl

McA Karen Arpad
Manager Water Department
province of Noord-Holland

Provincie
Noord-Holland

Congress Washington
D.C. d.d 14 jan 2012

The Netherlands

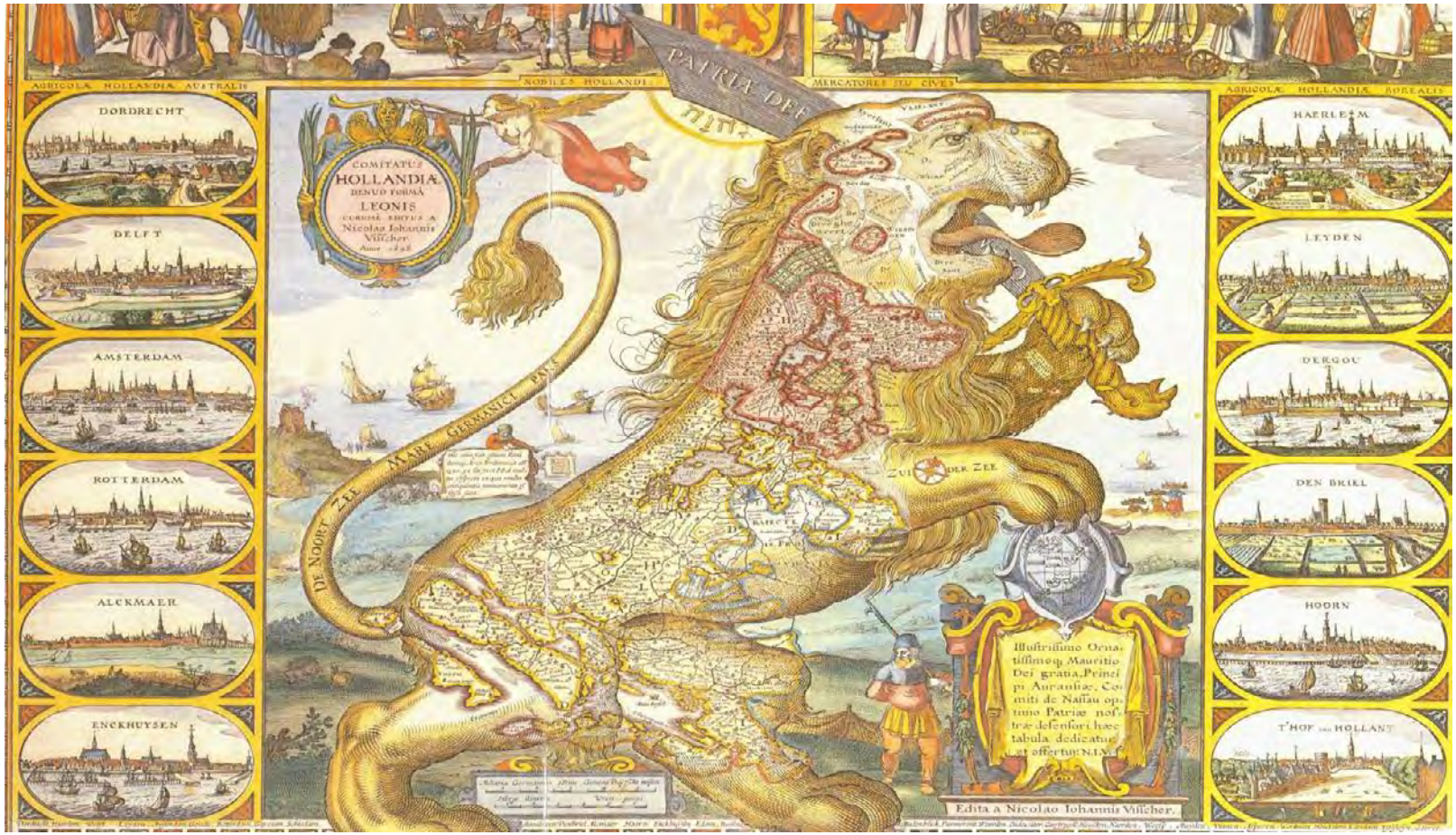


Provincie Noord-Holland

Noord-Holland: 1.031 square miles and 2.7 million people

Provincie
Noord-Holland

The coastline is the BACKBONE of the Netherlands



Provincie
Noord-Holland

The Netherlands without levees and dunes

Provincie
Noord-Holland

The 1953 flood

Provincie
Noord-Holland

Delta Programme

Provincie Noord-Holland

Delta Programme

- DP is aimed at keeping NL a good, safe and attractive place
- Two goals, three values
  - Safe now and in the future [2050-2100]
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  - Solidarity, flexibility, sustainability
- For the people and the economy

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- Delta Fund (approximately €1 billion/year)
- Adaptive delta management

Provincie
Noord-Holland

Multigovernmental process

Government collaboration in program teams, in order to:

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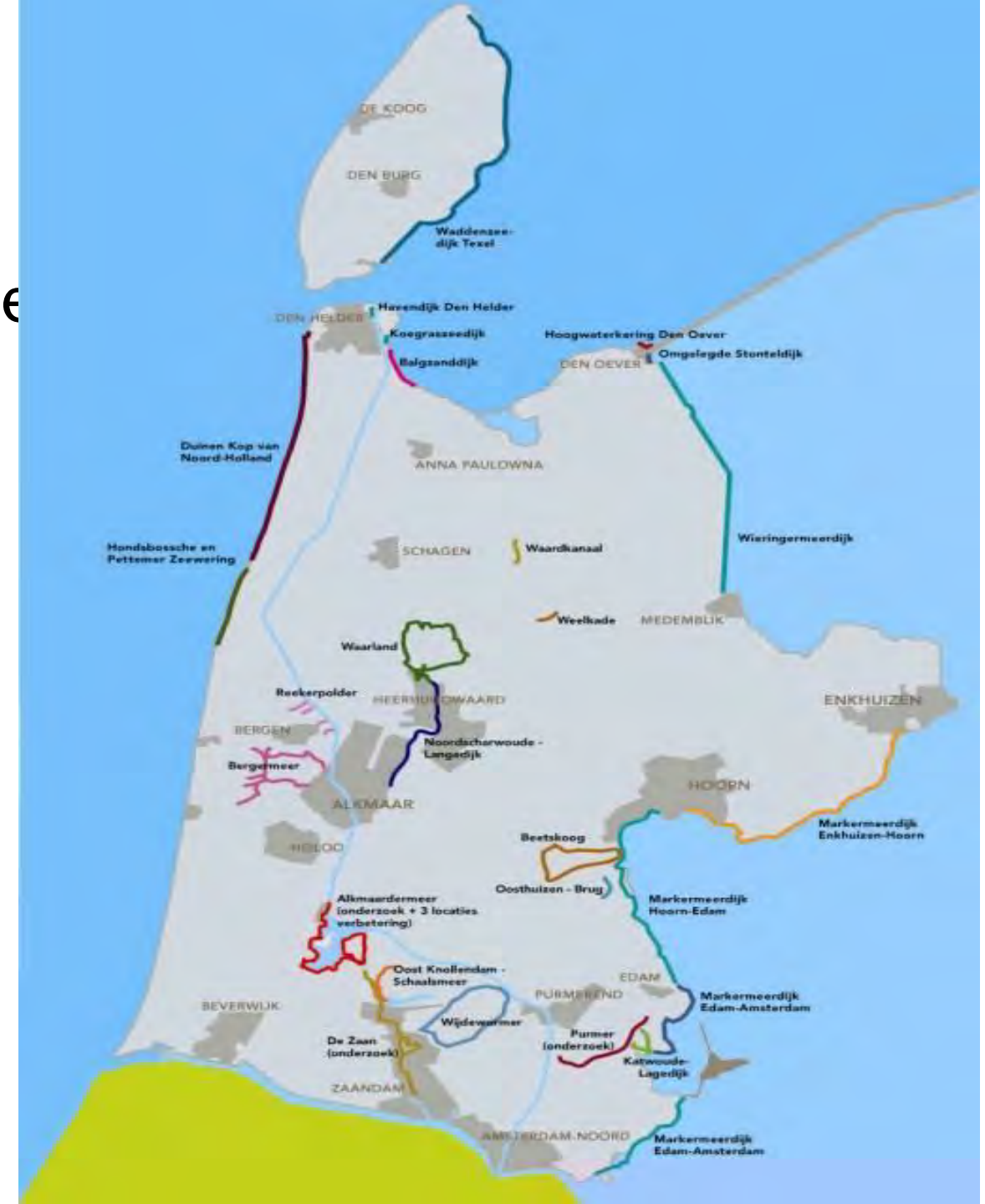
Supervised by Delta Programme Commissioner

progress, uniformity, coherence, transparency

present rolling on Delta Program / proposal to Government

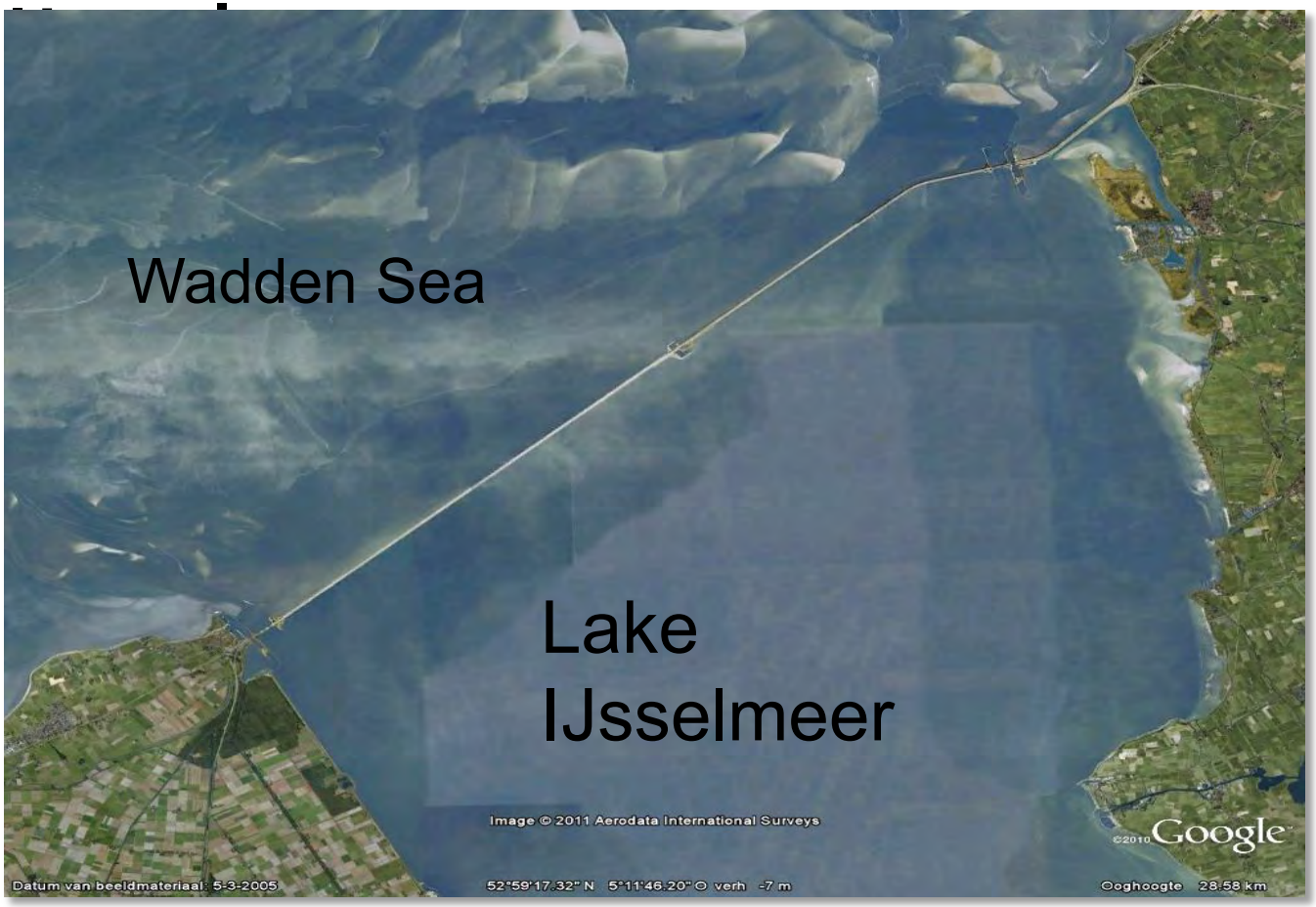
Provincie
Noord-Holland

More than 20 leve
and dunes
reinforcements
in province of
Noord-Holland
2005 → 2020



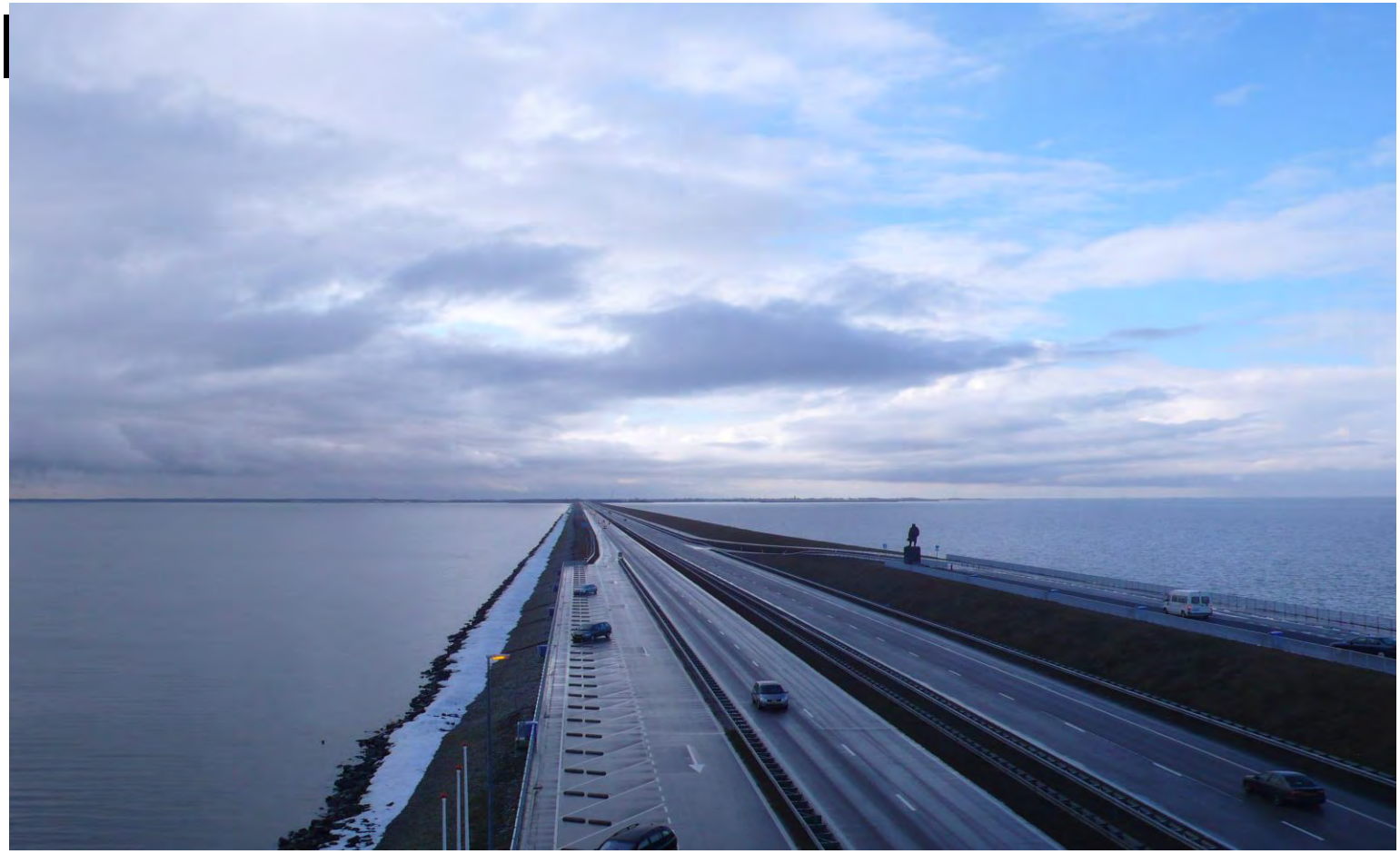
Provincie
Noord-Holland

Closure dam between Wadden Sea and lake



Provincie
Noord-Holland

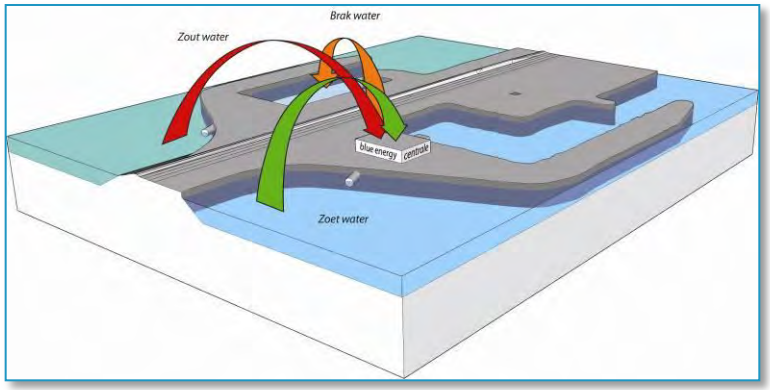
Closure dam between Wadden Sea and lake



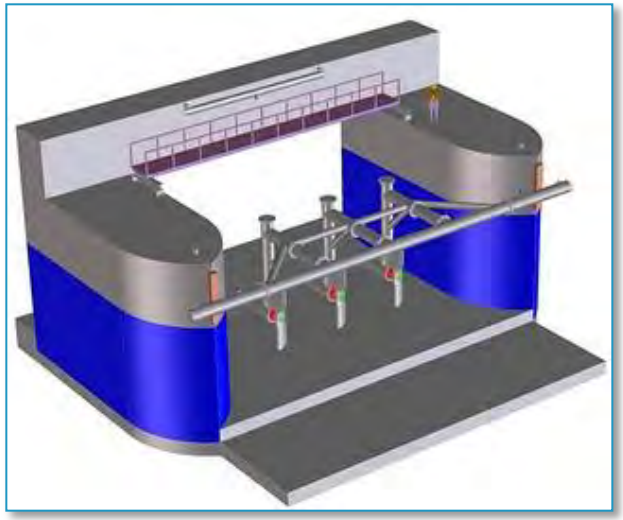
Provincie
Noord-Holland

New Closure dam and renewable energy = “Energy levee”

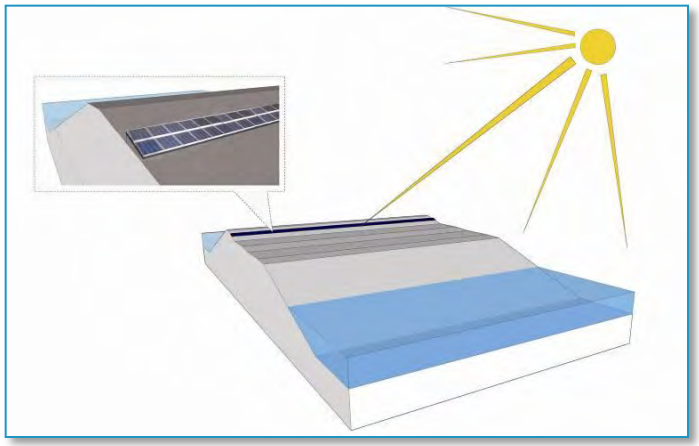
Blue energy



Tidal energy



Solar energy



Provincie Noord-Holland

Tidal and in-stream energy

Provincie
Noord-Holland

Weak Links Noord-Holland Coast, Sea Wall (2010)

Provincie Noord-Holland

Weak Links Noord-Holland Coast, Sea Wall (2010)

Provincie
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Weak Links Noord-Holland Coast, Sea Wall in 2015?

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Wadden Sea Levee in 2010

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Wadden Sea Levee in 2020

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Levee Hoorn – Amsterdam, 2010

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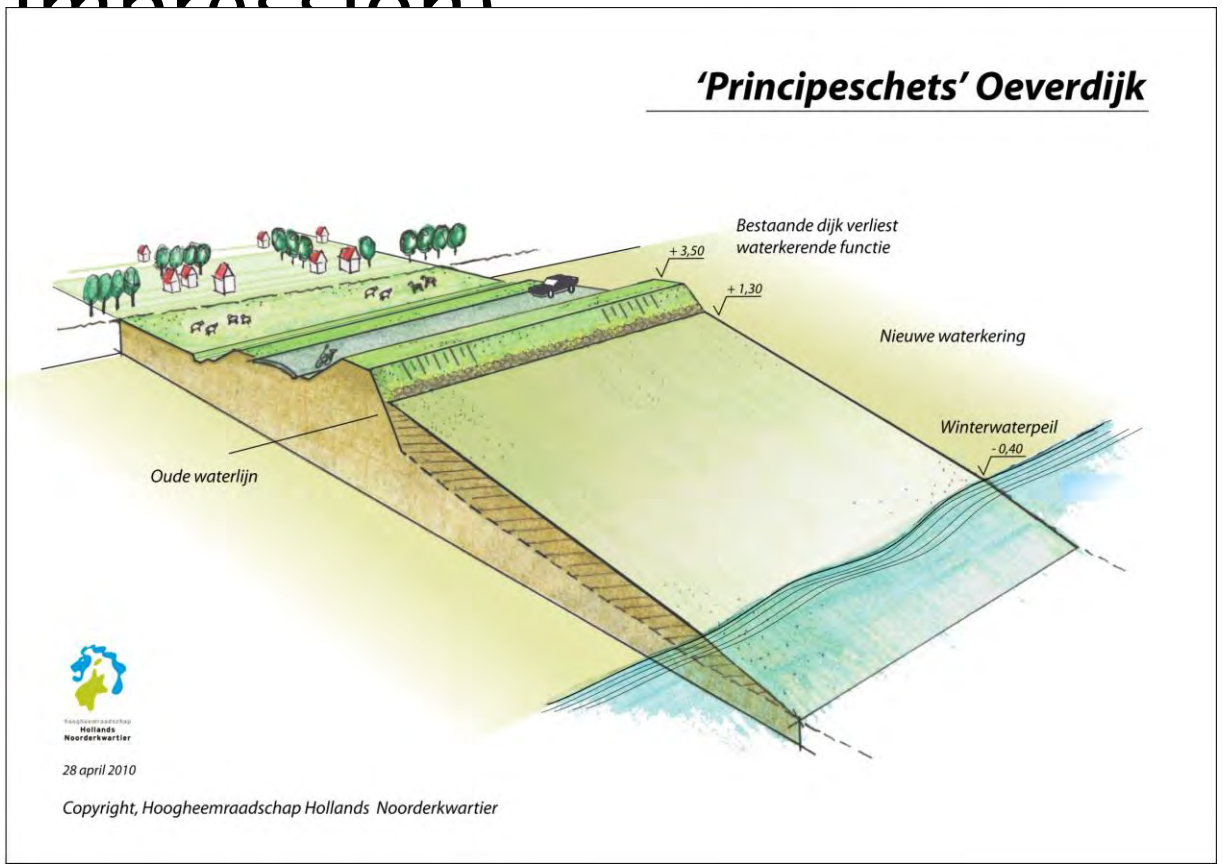
Levee Hoorn - Amsterdam with a wide foreshore (artist impression)



2020?

Provincie Noord-Holland

International efforts

- SUSCOD; lead partner in European funded project
- World Zero Meter Cities

http://www.youtube.com/watch?v=WZF_kdTmxuw

Provincie
Noord-Holland

Thank you for your attention

Images and artist impression provided by Bosch-Slabbers , Energy Valley and waterboard Hollands Noorderkwartier

Provincie
Noord-Holland

San Francisco Bay

Preparing for the Next Level

eter Wijsman

Vashington, DC – January, 2013

ARCADIS

1849

2100

ARCADIS


San Francisco Bay Plan
San Francisco Bay Conservation and Development Commission

The Adapting to Rising Tides Project

San Francisco Bay Conservation and Development Commission

ARCADIS

Adapting to Rising Tides

The goal of the ART project is to increase the preparedness and resilience of Bay Area communities to sea level rise and other climate change impacts while protecting ecosystem and community services.

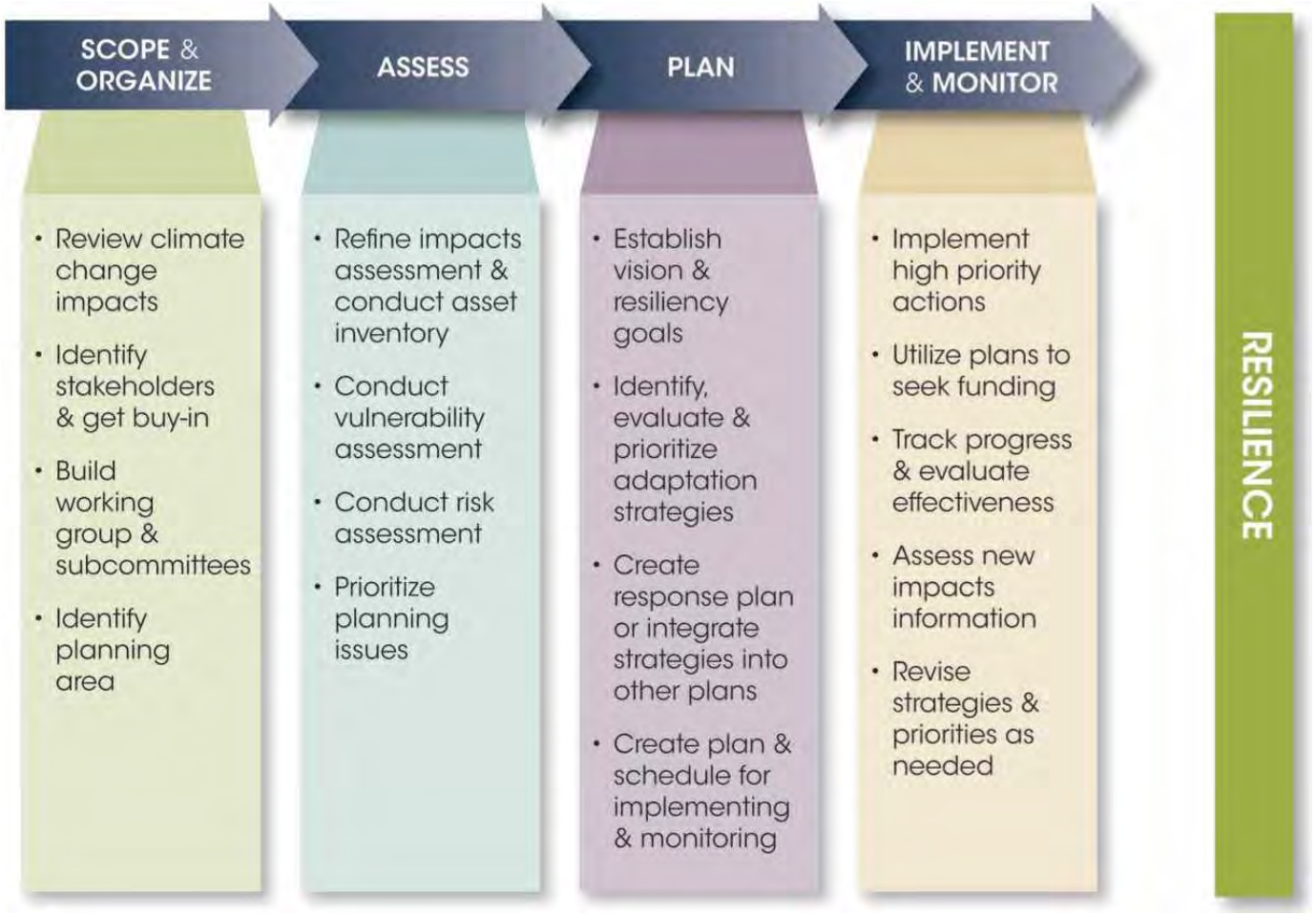
Photo: Ingrid Taylor

Adapting to Rising Tides

ART is a collaborative project to evaluate:

- How will sea level rise and storm events affect the future of Bay Area communities, infrastructure, ecosystems and economy?
- What approaches can we pursue, both locally and regionally, to assess these challenges, and reduce or manage these risks?

ART Adaptation Planning Process



ART Collaborative Project Management

San Francisco Bay Conservation and Development Commission

NOAA Coastal Services Center

U.S. Department of Transportation Federal Highway Administration

Metropolitan Transportation Commission

California Department of Transportation

ICLEI Local Governments for Sustainability

ART Subregional Working Group

- ABAG
- Alameda County (AC) Public Works
- AC Community Development
- AC Public Health Department
- AC Transportation Commission
- BART
- Bay Institute
- Bay Trail
- CA Coastal Conservancy
- Capitol Corridor JPA
- City of Alameda
- City of Emeryville
- City of Hayward
- City of Oakland
- City of San Leandro
- City of Union City
- East Bay Dischargers Authority
- East Bay Municipal Utility District
- East Bay Regional Park District
- H.A.R.D.
- Pacific Institute
- PG&E
- Port of Oakland
- San Francisco Estuary Institute

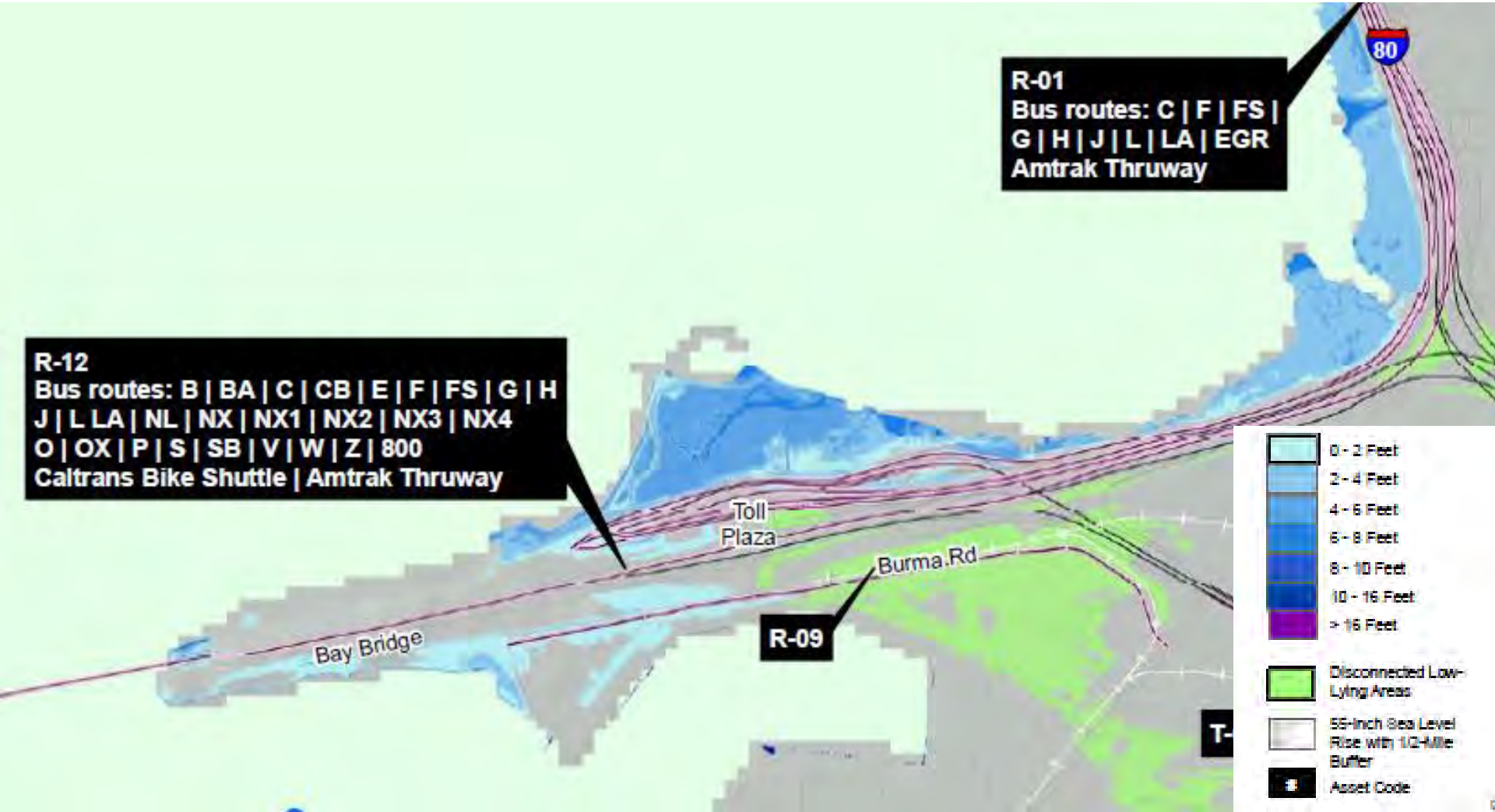
ART Asset Categories

- Airport
- Community land use, facilities, services
- Contaminated lands
- Energy, pipelines and telecom
- Hazardous material sites
- Ground transportation
- Parks and recreation
- Natural shorelines
- Seaport
- Stormwater
- Structural shorelines
- Wastewater

Risk and Vulnerability Assessment
Oakland-San Francisco Bay Bridge

- What are the sea level rise impacts under different scenarios?
- What is the sensitivity of the asset?
- What are the consequences?
- Which shoreline features are responsible for the inundation?

San Francisco-Oakland Bay Bridge
16” 100-yr SWEL



San Francisco Oakland Bay Bridge 55” 100-yr swel

Overtopping

0.1 - 1 foot
1 - 2 feet
2 - 3 feet
3 - 4 feet
4 - 5 feet
> 5 feet

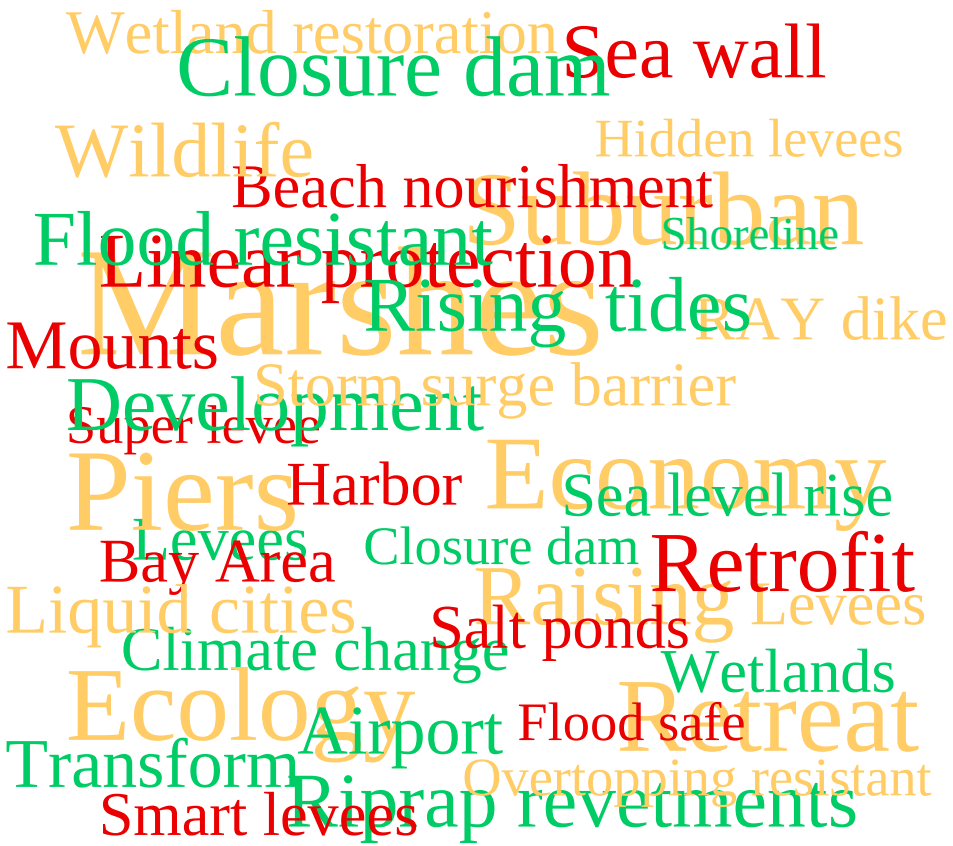
Shoreline System
Shoreline System Boundary
Shoreline System Number
Asset Code

Shoreline Asset "Overtopping" Analysis	
Proximity to Overtopping (distance)	***16" + 100-yr SWEL*** 30 ft
	55" + 100-yr SWEL 30 ft
Length Overtopped (% of Segment)	***16" + 100-yr SWEL*** 10,510 ft (45%)
	55" + 100-yr SWEL 16,900 ft (72%)
Average Depth of Overtopping	***16" + 100-yr SWEL*** 1.7 ft
	55" + 100-yr SWEL 3.9 ft
System Responsible (See overview map)	2

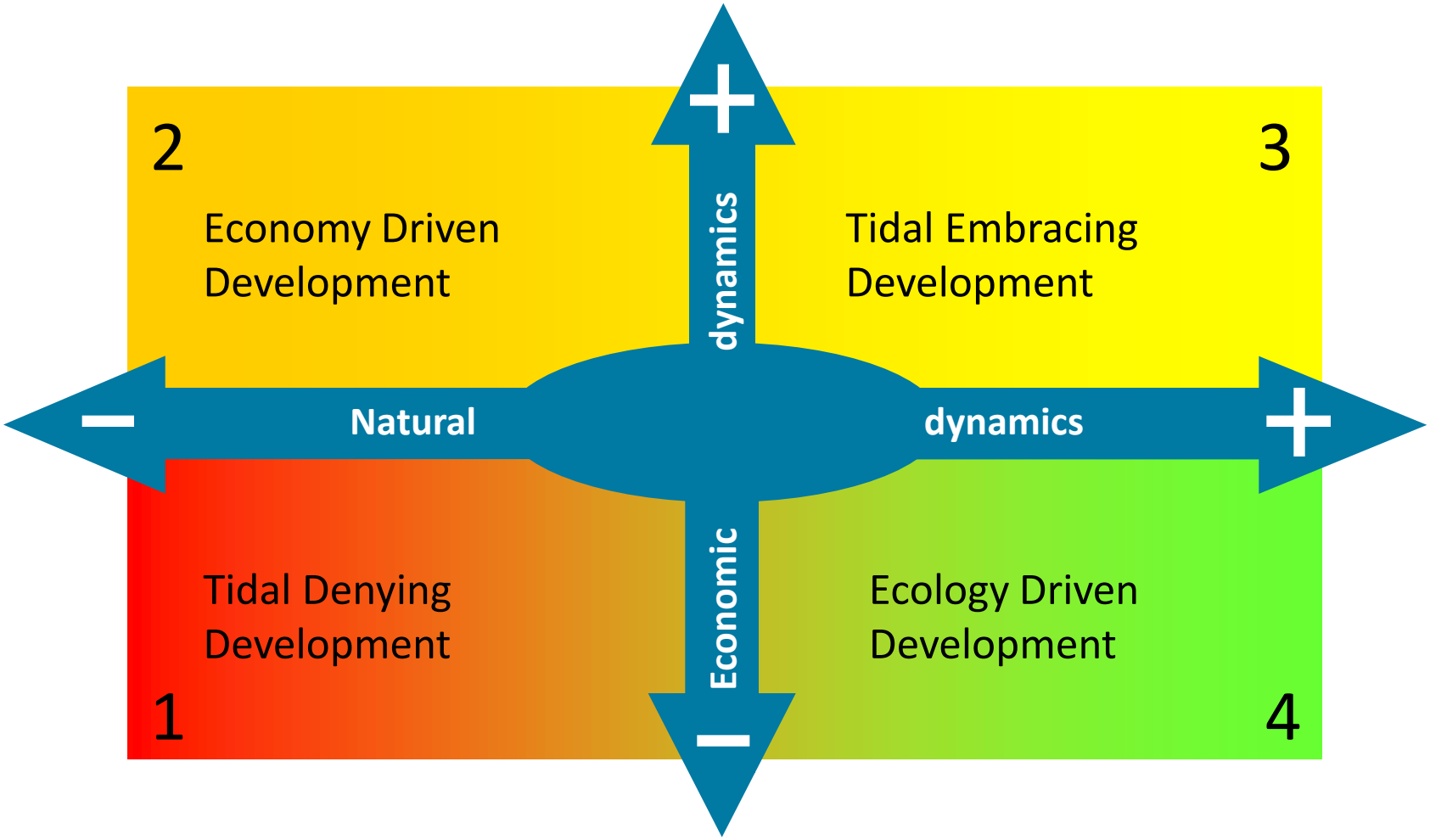
Shoreline typologies

Shoreline typology	Sub-level	Hotspots
Urban	City	City San Francisco
	Suburban	City San Mateo, Treasure Island
	Airport	SFO and OAK
	Port	Port of Oakland
Non-urban	Rural – Agricultural bay land	Not applicable for the South Bay
	Rural – Unimproved	Not applicable for the South Bay
Habitat	Altered	Salt ponds
	Natural	Tidal flats, former salt ponds
Bay	Altered	Shipping lanes, channels
	Natural	Shallow part bay , tidal flats

What strategy to select?



Tidal Rise Intentions



Example SDM: Waterfront San Francisco

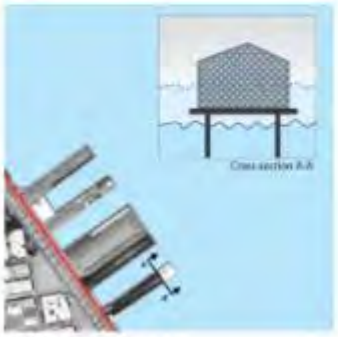
2

Economy Driven Development
- Piers protected
- Economic usage pier buildings

3

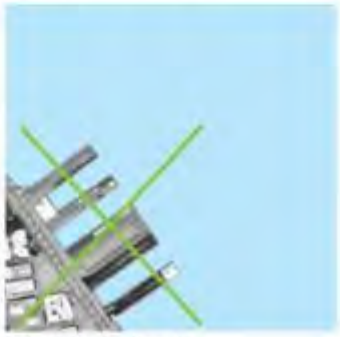
Tidal Embracing Development
- Piers not protected
- Flood resistant functions ground floor
- Flood proof functions upper floor(s)

1



Tidal denying Development
- Piers not protected
- Seawall on boulevard

4



Ecology Driven Development
- Not applicable

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In collaboration with:

San Francisco Bay Conservation and Development Commission


Questions?
415.244.2118
Peter. Wijsman@arcadis-us.com
Photo: Ingrid Taylor