

DGDC Meeting Minutes
December 9, 2010
9:00 a.m.
Room 220, Kent Co. Admin Building
555 Bay Rd. Dover, DE

Attendance List:	
Mike Mahaffie.....	OSPC
Mary Harper	Cultural Affairs/ Dept. of State
Ed McNeeley.....	GIC/Dept. of State
Barbara Gladders.....	DHSS/DPH
George Yocher.....	DHSS
Sandy Schenck.....	DGS
Lillian Wang.....	DGS
Miriam Pomilio.....	DGS
Ben Mearns.....	UD/RDMS
Nicole Minni.....	UD/IPA
John Laznik.....	UD/CADSR
Kim Cloud.....	DTI
Boskey Kamboj.....	DTI
Bruce Allen.....	DelDOT
Josh Thomas.....	DelDOT
Matt Laick.....	DelDOT
Darrin Dell.....	DelDOT
Jay Gerner.....	DelDOT
Peggy Bacon.....	DelDOT
Mike Krumrine.....	DNREC
Michael Townshend.....	DNREC
Carl Yetter.....	Coastal Programs
Rick Sherwood.....	DEMA
Doyle Tiller.....	OMB/DFM
Megan Nehrbas.....	Sussex Co.
Mike Ward.....	Kent Co.
Danielle Lamborn.....	Kent Co.
Kevin Curtis.....	Kent Co.
Mark Nowak.....	City of Dover
Patrick Susi.....	New Castle Co.
Julie Neff.....	New Castle Co.
Rick Steffers.....	City of Wilmington
Brook Sanders.....	City of Wilmington
Sandy Spence.....	League of Women Voters
ES Shelton.....	League of Women Voters
Roger Barlow.....	USGS
Art Walker.....	USDA/NRCS
Kevin Holmes.....	Census Bureau
Michael Hanna.....	Tidewater Utilities
Phil Day.....	Pictometry
Tim Miller.....	Miller-Lewis, Inc.
Steve Elliot.....	ESRI

Welcome

Mike Mahaffie started the meeting at approximately 9:05 a.m. with a welcome. He used a “prezi” on-line presentation (prezi.com/sm6onhdpr7vn/dgdc-1292010) to work through the agenda.

Announcements

DGDC Meeting Schedule

Mike Mahaffie announced [a tentative schedule of DGDC meetings](#) for 2011, as follows: March 10, June 9, September 8, and December 8. This schedule sets a DGDC meeting on the second Thursday of every three months. He didn’t say this, but the meetings will all be from 9:00 a.m. to noon in room 220 of the Kent County Administration Building, in Dover.

ESRI Delaware Users’ Group (DUG)

The next DUG meeting will be on the afternoon of March 10, following the DGDC meeting in the Kent County building. Anyone with content ideas should contact [Debbie Sullivan](#). ([See attached presentation](#))

Approval of September 23, 2010 Meeting Minutes

Matt Laick made a motion to approve [the September 23, 2010 meeting minutes](#) (PDF) as presented. Darren Dell seconded the motion and it passed, unanimously.

Reports

GIS Day Subcommittee

Subcommittee co-chair Danielle Lamborn gave a brief report on the GIS day field trip activity which attracted around 270 students and

brought together many volunteers from the GIS Community. The GeoEducation in Delaware subcommittee web site (MyGeoWorld.org) includes [a write-up of the event](#).

Transportation Data Subcommittee

Bruce Allen gave an update on the project to create a single, statewide, routable centerline file. DelDOT staff are working now on a data architecture document, based on a successful pilot with Sussex County.

Bruce reported that DelDOT will need to craft a Memorandum of Understanding (MOU) with each county to help guide the project. He added that it looks like the project should also include the city of Wilmington, which has also managed its own centerline data in the past.

USGS/Federal Report

Roger Barlow reported on several federal activities, including the announcement recently of a [“Geospatial Platform”](#) as the federal government’s next step in developing a National Spatial Data Infrastructure (NSDI). Roger noted that, if the project is fully funded, it will provide a more tangible implementation of a national geospatial infrastructure. He said that it will be, partly, a collection of linked data services. And it will incorporate the [Geospatial OneStop](#).

Roger also pointed to a new update of the White House’s guidance on OMB Circular A-16 (“Coordination of Geographic Information and Related Spatial Data Activities”). In [a memo in early November](#) (PDF), Federal CIO Vivek Kundra issued an updated guidance document that focuses on investments in geospatial data “as a capital asset.”

Roger reported that the new (2010) orthophotography for New Castle County will be delivered in January and will be disseminated by New Castle County. It is true color data, 4-band, at a quarter meter resolution.

And Roger reported that the state of Maryland has signed an MOU with the federal government to maintain its portion of the [National Hydrography Dataset](#) (NHD). There will be NHD classes in Maryland for the staff that will work on the data. There was a discussion of the need to coordinate between Maryland and Delaware’s NHD managers, in DNREC, on cross-border and shared-watershed issues. Maryland’s maintenance of the NHD is not (yet) at the same level of resolution as the Delaware NHD data.

There will be a national NHD meeting held in Denver, CO, on May 9, 2011. It is not yet known whether or not USGS will subsidize travel costs for state representatives.

Old Business

Strategic Plan/Business Plan

Mike Mahaffie reported on the completion of the strategic planning project and the closure of the FGDC grant for that project. The FGDC has accepted [Delaware's Strategic and Business plans](#) and a final report [has been posted on the FGDC web site](#). Mike noted that the strategic planning process has helped bring Delaware’s GIS coordination effort to a new level of maturity. Even if a new GIS Office, as called for in the strategic plan, does not come into existence in the near term, he added, the process was worthwhile and helpful.

2011 Orthophotography Project

Mike Mahaffie reported that the effort to reach agreement with the USGS contracting office to manage a 2011 orthophotography project for Kent and Sussex Counties has stalled while awaiting approval from the state contracting office. There are series concerns about whether or not this will come in time to

meet federal deadlines. Mike stated that, if that is not possible, the working group that has been focused on this project will have to seek other approaches.

Broadband Mapping

Boskey Kamboj, from DTI, gave an update on the project to map broadband access in Delaware and plan for improvements to that access as part of a broader, 21st-century-focused, economic-development strategy. Boskey reported that the DTI has procured the hardware and software for project and hopes to have a broadband mapping web site ready for a debut in the New Year. There was discussion of a demonstration of the site at the next DGDC meeting.

Technical Infrastructure Subcommittee

Kim Cloud gave a report on the new [Delaware Geospatial Data Exchange](#) that the Subcommittee has been working on with DTI. The Exchange is now open to the public and members of the GIS community should use it to share GIS data and metadata. There are several levels of security, including an open “public” access.

Kim gave a demonstration of the site, how to register, how to log in and how to manage data and metadata on the site. The Exchange can be used to disseminate data, or as a metadata repository, with links to existing data download sites.

There was a general discussion of approaches to the use of the site and what should be the DGDC’s strategy around the Exchange, going forward. In particular, there will need to be a discussion of how the Exchange and the DataMIL should interact.

In the short term, however, it is important that the members of the GIS Community start to use the Exchange, upload data and/or metadata, and identify and bugs, problems, and glitches so that they can be fixed.

New Business

DataMIL Topo Maps

Sandy Schenck led a discussion of the Delaware Topographic Map feature of the [Delaware DataMIL](#). He was seeking input on usage of this feature as part of a planning process for the future of DataMIL. Delaware has been creating up-to-date topographic maps, in PDF format, since around 2004. They replace the out of date USGS topographic map series (paper) that have no data more recent than 1993.

It was noted that the USGS now offers a new “USGS Topo” which places more recent GIS data over orthophotography. It was also noted that the University of Delaware’s digital archives includes an annual series of the DataMIL Topos, for historic purposes.

Census Update

Kevin Holmes, geographer with the Regional Census Office, gave a report ([attached](#)) on new data releases expected from the American Community Survey and the 2010 Census. A set of national-level demographic analysis profiles has just been released. This is an estimates series that is kept separate from the decennial Census so that it can be used as a way to test the Census data.

On Tuesday, December 14, the Census Bureau will release the first-ever 5-year data from the [American Community Survey](#) (ACS). This is data on the characteristics of the population, based on an on-going annual survey of the population. The 5-year data will be available for areas as small as block groups, but will be published with Margin of Error (MOE) information that must be assessed. In some places, the population of an area will be too small for the ACS data to be really meaningful. There will need to be training and support for data users. ACS data will be available on [the American FactFinder web site](#).

The ACS data and the 2010 Census data to be released starting around February of 2011, will be based on the new [TIGER shapefiles of Census geography](#) that were released this week. All of the census geographies (state, county, county subdivision, place, tract, block group, block, etc.) are included, along with the various geographic components used to map the Census geography (roads, streams, etc.). Mike Mahaffie reported that his preliminary review shows that the new TIGER data are very well matched to Delaware's framework data. He noted that thanks are due to John Laznik and others as the UD's CADSR office who worked closely with the Census Bureau on updating TIGER.

Learning Things

Web Mapping at the News Journal

Jim Meek, formerly of the News Journal Newspaper, shared some of the lessons he learned making [on-line maps for the newspaper](#). He noted that on-line maps created for large audiences need to be fast, able to handle a large user load, and should be simple and easy to use. He has used, variously, the Google maps API, map services created using ESRI's tools, java scripting and text-based XML files.

DNREC's Sea Level Rise Inundation Scenarios

Carl Yetter, of Delaware Coastal Programs, gave a presentation ([attached](#)) on sea level rise and on DNREC's effort to prepare for it. A major component has been a project to map potential inundation areas, based on various GIS data sets, including the elevation data derived from the 2007 LiDAR project. He also described some of the GIS work that will go into a major planning effort for a Statewide Adaptation Plan now getting started.

Working with the ArcGIS API for JavaScript

Michael Townshend, of DNREC, gave a presentation ([attached](#)) on his efforts to create [on-line maps to show the projected Sea Level Rise inundation areas](#) developed by Delaware Coastal Programs. He explained that his challenges were creating a system that could handle high usage, integrate easily into the state's "common look and feel" for web sites, be easy to use, and be developed with limited time and budget.

Michael noted that the inundation area polygons, though there are few of them, are large and very complex, with a large number of vertices. He explained that a first attempt to create an on-line inundation map, using the Google maps API, proved to be too slow for easy public use. Staff from the Government Information center (GIC) had put in a good deal of work testing out this approach and proving that it was not practical for this data set. Michael reported that the answer has been to use the ArcGIS server multi-layer cache and he gave a brief overview of how he set that up.

Looking ahead, Michael led a brief discussion of the opportunities presented by this approach. He noted that it is not difficult to develop on-line maps using these tools, but it is important that there be a shared set of resources, specific to Delaware, that can be used. The DGDC will need to find a way to provide a set of shared ArcGIS Server instances that can be used by a wide segment of the community. That will require much discussion and some key decisions by the community.

Michael proposed the following questions:

- Do DGDC members want access to a state-hosted ArcGIS Server and to create custom web applications based on various scripting tools?
- Do we have the programming experience or time to learn how to build mapping applications?
- Can the DGDC decide:
 - On a common projection for map services (DE state plane, web Mercator)
 - On a common tile scheme for cached services (projection, tile size, origin, scale levels)

These questions will form the basis for much of the work of the DGDC and its subcommittees over the coming year.

Sandy Schenck made a motion to adjourn at approximately 12:15 p.m. Matt Laick seconded it and the motion passed, unanimously.



Next Meeting

March 10, 2011

1:30 pm

**Kent County
Building**

**Same day as the
next DGDC meeting!**



The Delaware/ESRI User Group is a meeting for the grass roots GIS User.

The meetings consist of:

Local Demo – featuring YOU!

ESRI Demo – featuring ESRI.

Tips and tricks – suggestions for shortcuts and alternative ways to work with your GIS Data.

Questions and answers – Something on your mind that you want to toss around with your colleagues?

This is the time to share your questions and answers.



**eDUG wants
YOU!**

eDUG is looking for **Local Presentations!
If you would like to show off your GIS
prowess to the Delaware GIS Community
please let us know.**

Tips and Tricks – Got one? Share with the us!

Contact us and let us know!

Debbie Sullivan – Deborah.Sullivan@state.de.us

Danielle Lamborn - Danielle.Lamborn@CO.KENT.DE.US

American Community Survey Data Products Release Schedule

Data Product	Population Size of Area	Data released in:							
		2006	2007	2008	2009	2010	2011	2012	2013
1-Year Estimates for Data Collected in:	65,000+	2005	2006	2007	2008	2009	2010	2011	2012
3-Year Estimates for Data Collected in:	20,000+			2005-2007	2006-2008	2007-2009	2008-2010	2009-2011	2010-2012
5-Year Estimates for Data Collected in:	All Areas*					2005-2009	2006-2010	2007-2011	2008-2012

* Five-year estimates will be available for areas as small as census tracts and block groups.

Source: US Census Bureau



2010 Census TIGER/Line® Shapefiles

TIGER Navigation

2010 CENSUS TIGER/LINE SHAPEFILES
MAIN

DOWNLOAD SHAPEFILES
RELEASE SCHEDULE
TECHNICAL DOCUMENTATION
USER NOTES

PREVIOUS VERSIONS

2009 TIGER/LINE SHAPEFILES
2008 TIGER/LINE SHAPEFILES
2007 TIGER/LINE SHAPEFILES
TIGER/LINE FILES

GEOGRAPHY MAIN PAGE

What are the TIGER/Line Shapefiles?

- 2010 extracts containing geographic and cartographic information from the Census Bureau's MAF/TIGER® (Master Address File/Topologically Integrated Geographic Encoding and Referencing) database.
- These files support the 2010 Census Redistricting Data (P. L. 94-171) release.
- The files provide the digital map base for a Geographic Information System or mapping software. The files do not contain any mapping software.
- The files contain the boundaries for legal entities as of January 1, 2010.
- The geographic entity codes needed to link the Census Bureau's demographic data to the geography are included in the files. The TIGER/Line Shapefiles do not contain any demographic or economic data; data can be downloaded separately using [American FactFinder](#).

2010 Census Redistricting [P.L. 94-171] TIGER/Line Shapefiles

- 2010 Census Redistricting [P.L. 94-171] TIGER/Line Shapefiles may be obtained via the [Download the 2010 TIGER/Line Shapefiles now](#) link
- [Shapefiles included in the Redistricting \[P.L. 94-171\] delivery](#)
- [More information about the Redistricting Program](#)

Download

- [Download the 2010 TIGER/Line Shapefiles now](#)

DNREC's Sea Level Rise Inundation Scenarios

Carl Yetter
December 9, 2010



Take-Aways

- Sea Level Rise is happening
- Preparing makes sense
 - ✓ Also prepares for coastal storms
- DNREC will lead by example
- Tools, resources and help are available



Today's Storm Surge is Tomorrow's High Tide

Sea Level Rise planning = coastal storm protection

- '62 Storm – Lewes
 - ✓ 4.5 ft above MHHW
- Mothers Day Storm 2008 – Bowers Beach
 - ✓ 4 ft above MHHW
- Veterans Day Storm 2009 – Lewes
 - ✓ 3 ft above MHHW

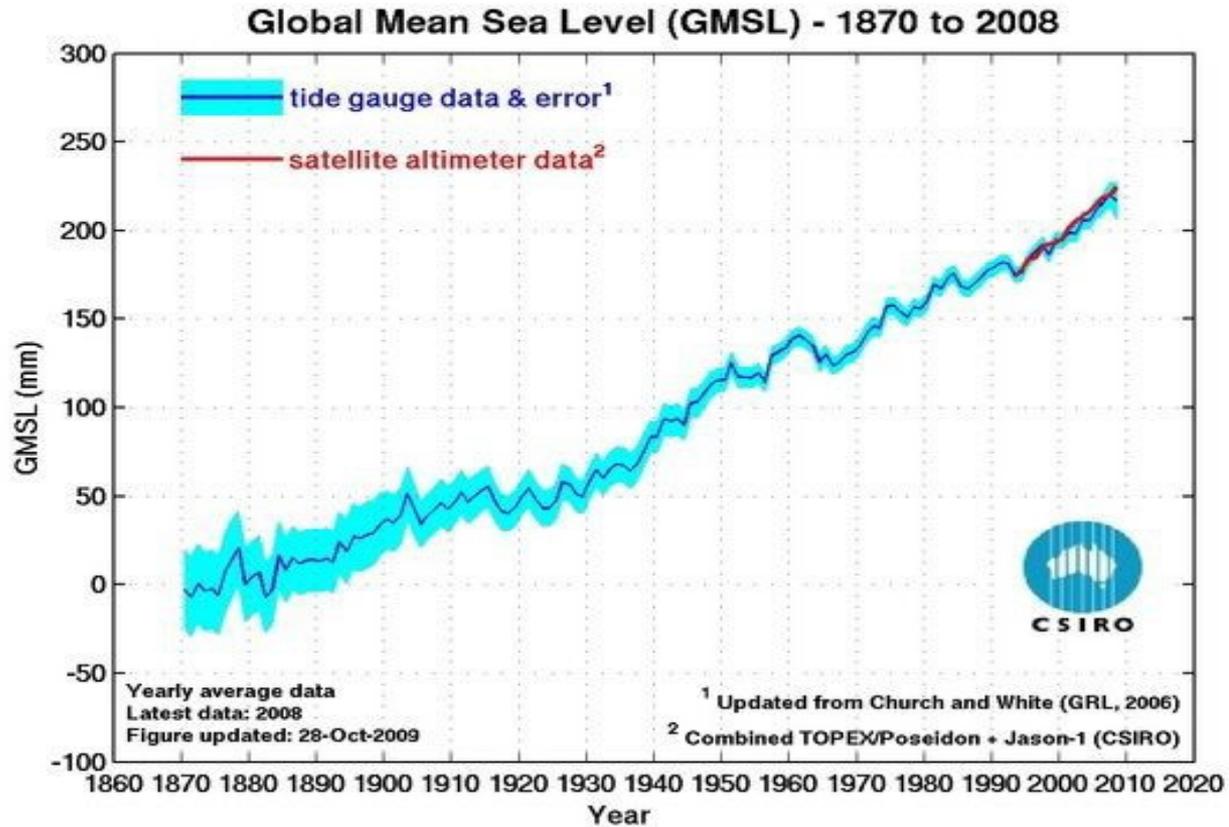


Overview

- Sea Level Rise 101
- DNREC Sea Level Rise Policy
- Inundation Mapping
- Next Steps



Sea Level Rise - Global



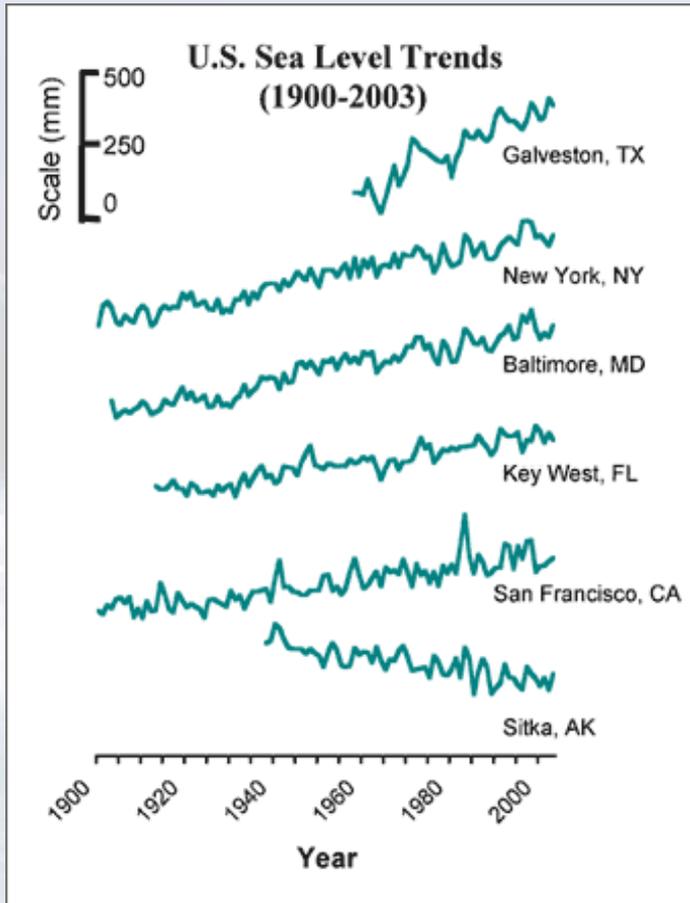
Causes of Global Sea Level Rise

0.55 ft rise over 100 years

- ✓ Expansion of ocean water
- ✓ Melting of mountain glaciers and small ice caps
- ✓ Melting of the Greenland Ice Sheet and the Antarctic Ice Sheet



Local Variation

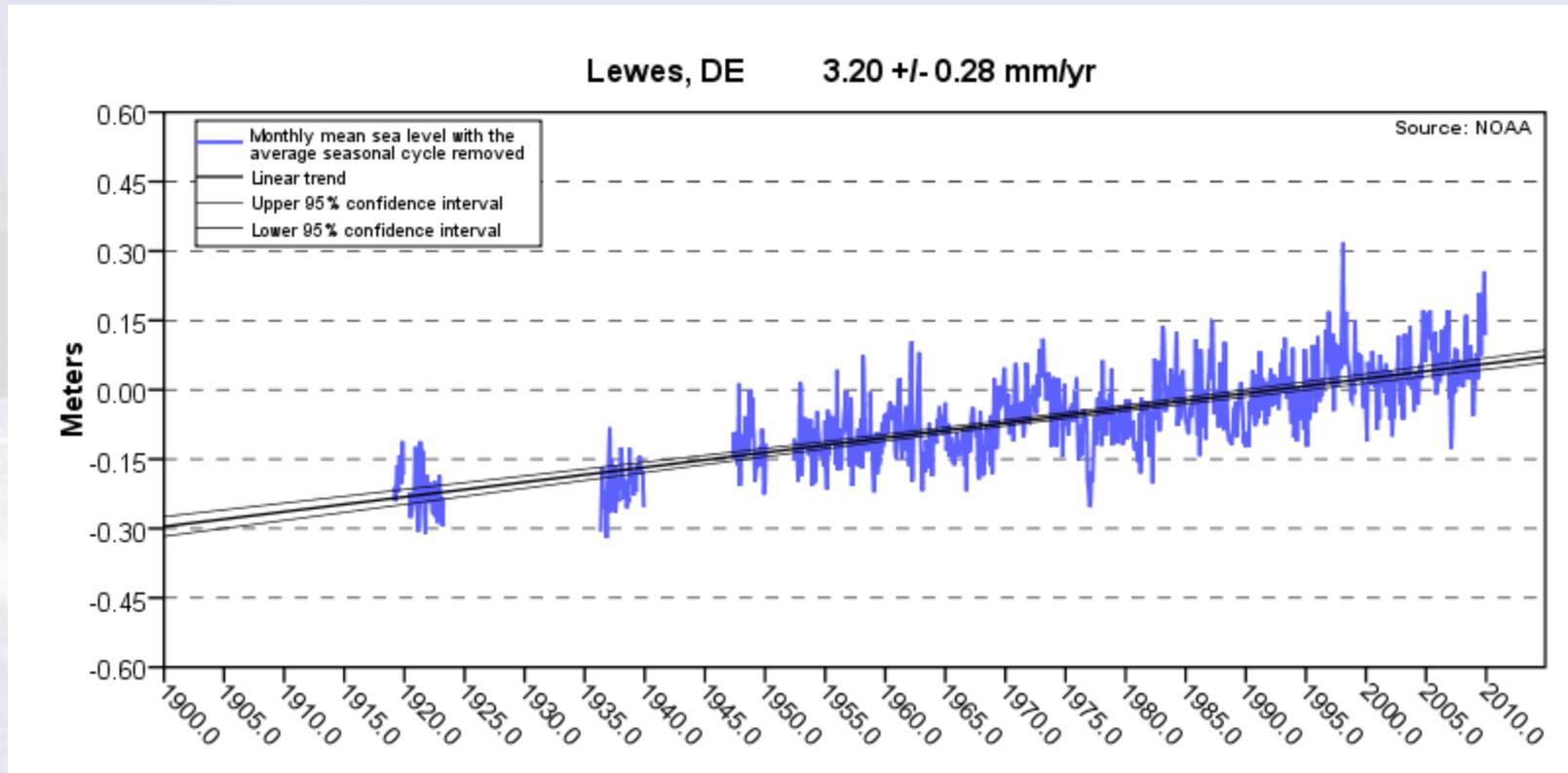


Source: EPA

Global rate = 1.7 mm/yr
Delaware rate = 3.35 mm/yr

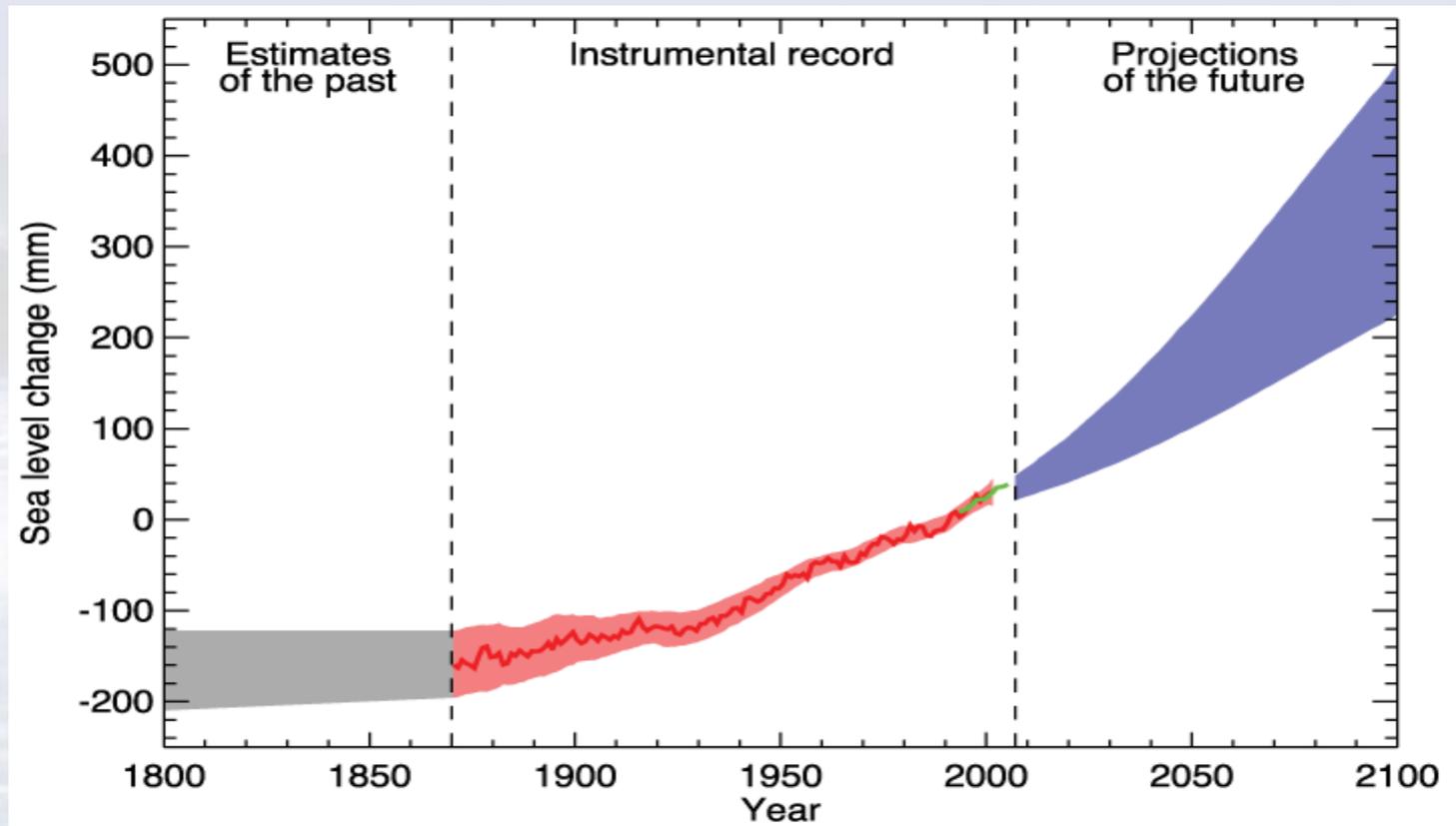
- Tectonic Subsidence
- Sub-Surface Compaction
- Ocean Currents

Sea Level Rise @ Lewes, DE

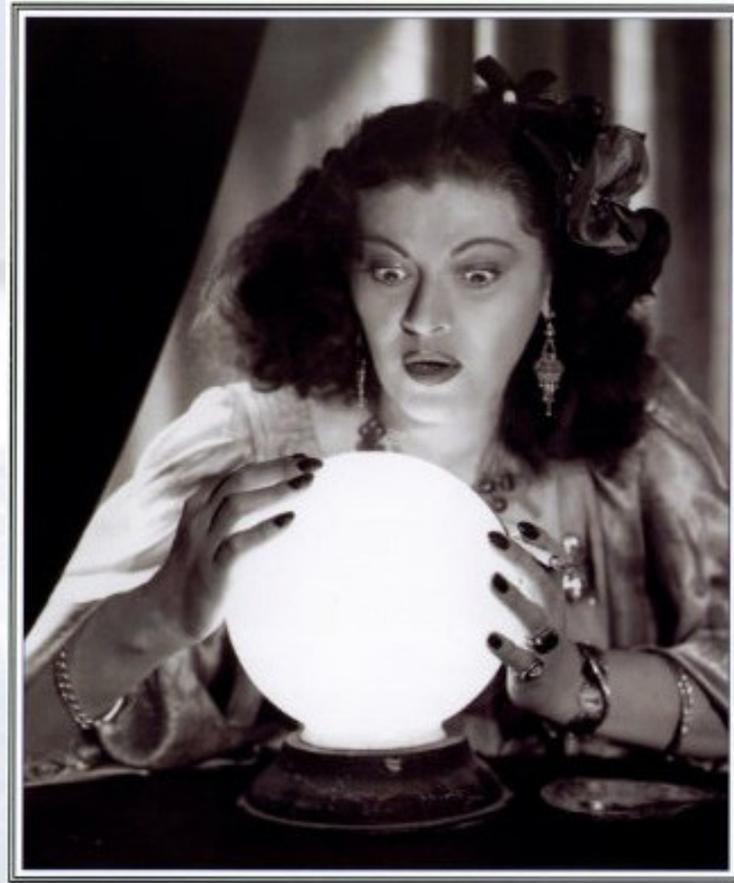


Predicted Future Global Rates

IPCC (2007) prediction of 0.18 - .59 meters by 2100



Taking Action in an Uncertain Future



DNREC SLR Policy

Department of Natural Resources & Environmental Control
Administrative Policies and Provisions

Subject: D-1306 – Sea Level Rise Adaptation

Section: D-1300 – Resources Programs Management

Issued: 1/27/2010

Revised:

Page: 1 of 2

Procedure:

Background

Delaware experiences inundation from the sea on a regular basis. Coastal Storms routinely cause flooding through the effects of storm surge and heavy rainfall. The resulting inundation causes significant social and economic impacts in the short-term. Future inundation impacts will be further exacerbated by local changes in sea level.

Documented data has shown that Sea level has increased in Delaware by more than one foot over the past century. The conclusion of the Intergovernmental Panel of Climate Change is that the rate of sea level rise will increase over the next century. While evidence has shown that the sea level has changed dramatically over the course of time, the coastline can no longer adapt naturally as it has in the past due to human development and alterations of the landscape.

Sea level rise will cause increased inundation and shoreline erosion; increased tidal surge, flooding from severe weather events; accelerate saltwater contamination of ground water and surface water supplies, elevate water tables, and expedite loss of critical habitats.



1. All DNREC programs shall use the following range of sea level rise scenarios, appropriate to the project's longevity and nature. Projects of a longer expected life or more critical nature should practice precautionary principles and use a more protective sea level rise scenario.

As of February 1, 2010; the following scenario(s)* shall be used:

0.5 meters by 2100 for low sensitivity projects
1.0 meters by 2100 for medium sensitivity projects
1.5 meters by 2100 for high sensitivity projects

*These values shall be adjusted as the IPCC and other peer reviewed publications produce updated projections and modeling techniques.

Secretary, Department of Natural Resources and
Environmental Control

Date 1/27/10



Developing SLR Policy Values

■ Committee of Local Scientific & Technical Experts

- Representatives from DNREC Divisions
- University of Delaware
- Delaware Geological Survey
- Local Estuary Programs

Reviewed by National Experts

- **NOAA**
- **USGS**
- **EPA**

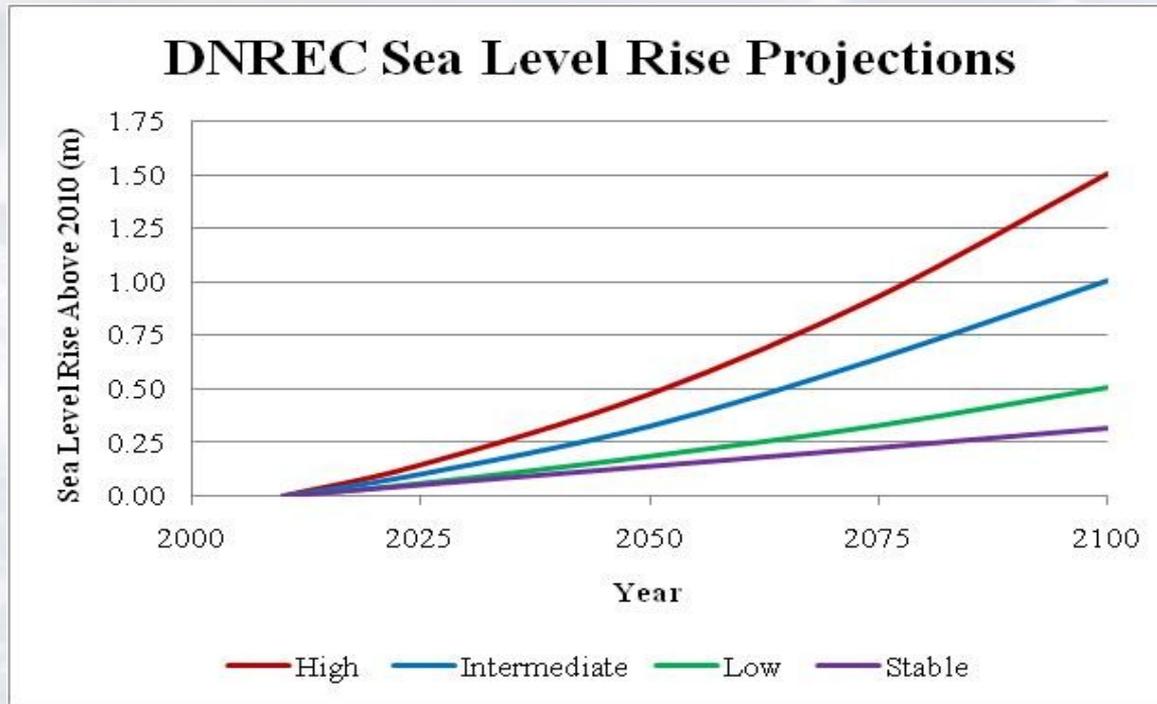


Just the Facts

- Hundreds of peer-reviewed papers on Climate Change with various predictions on SLR
- Numerous Expert-Panel based reviews have been completed with more resources than available to DNREC
- Decision: Only consider values accepted by Federal Agencies and International Organizations in developing DNREC SLR Rates



- **DNREC LSLR values for Delaware are 0.5, 1.0, and 1.5 meters by the year 2100.** These values represent the minimum, intermediate, and maximum rates expected based on currently available information



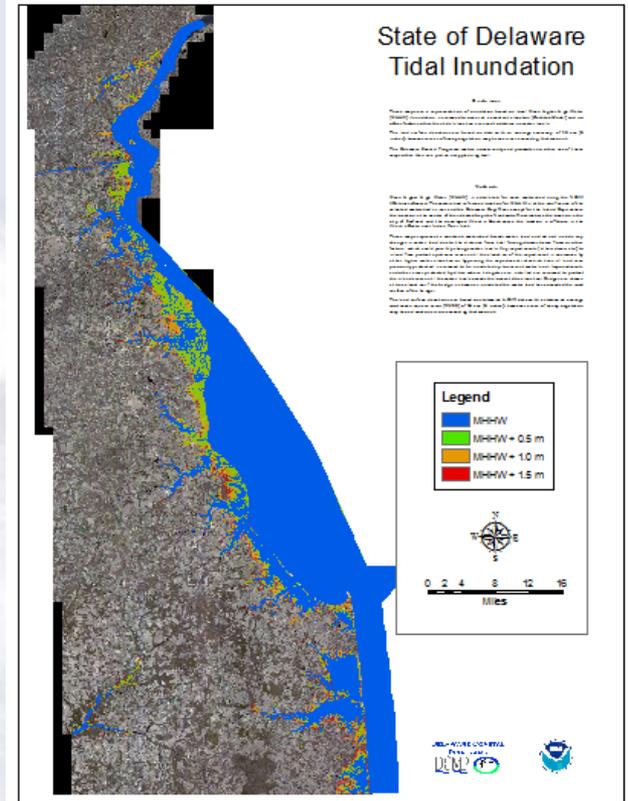
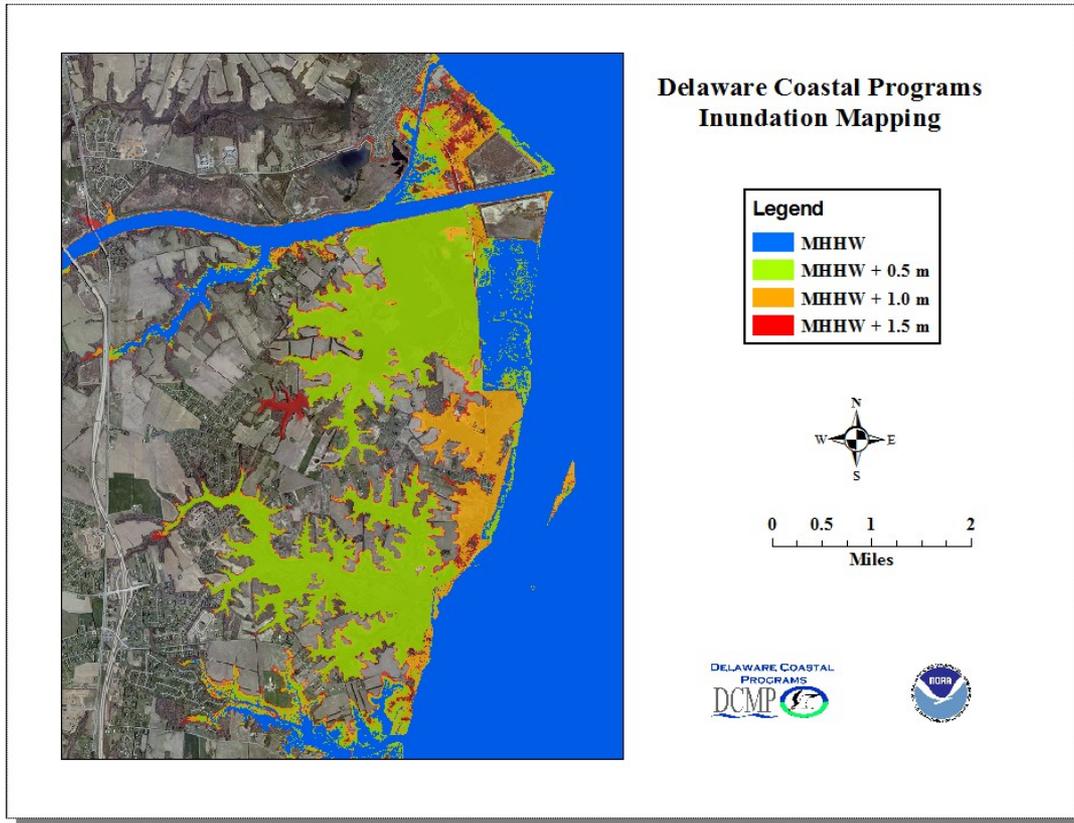
Today's Storm Surge is Tomorrow's High Tide

Sea Level Rise planning = coastal storm protection

- '62 Storm – Lewes
 - ✓ 4.5 ft above MHHW
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Inundation Maps



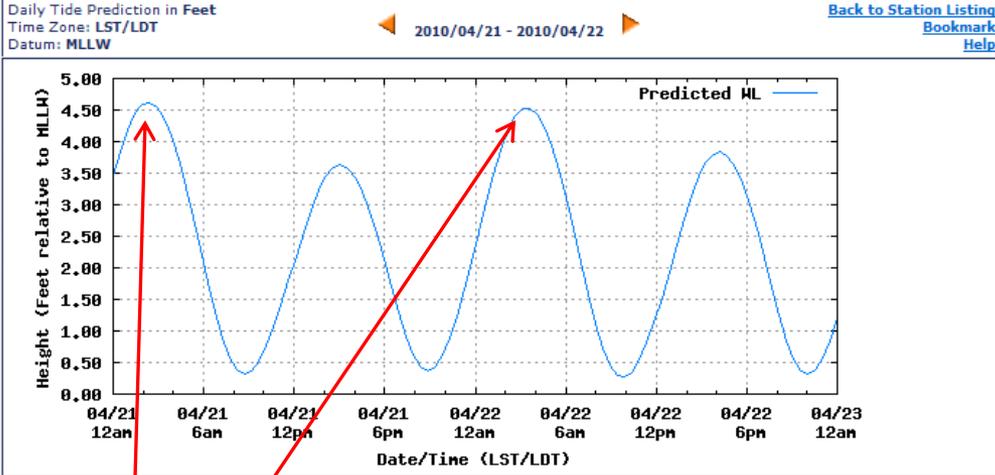
Creating Inundation Maps

- Constant Level or Bathtub Model
- Water level does not change due to:
 - ✓ Tidal Forcing
 - ✓ Downstream Flow
 - ✓ Withdrawals or Inputs
- Impediments to inland flow protect upstream areas until overtopped
 - ✓ Dikes
 - ✓ Dams
 - ✓ Tidegates
- Based on Mean Higher High Water



MHHW

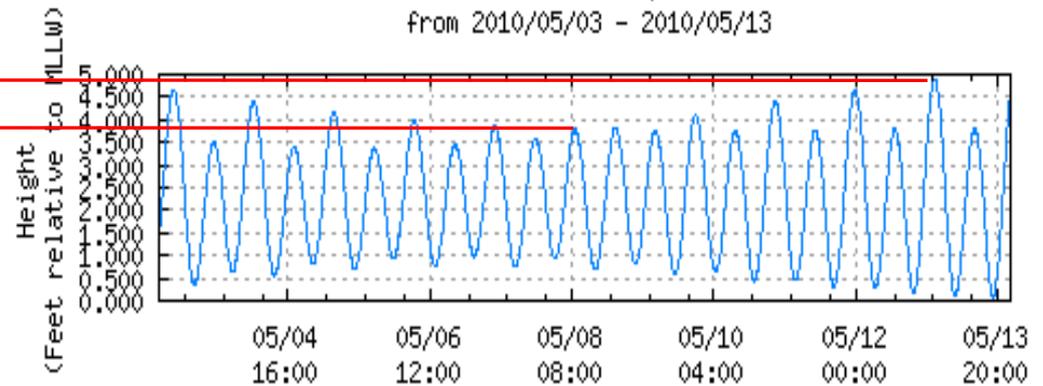
LEWES, DE StationId: 8557380



The average of the higher high water height of each tidal day observed over the National Tidal Datum Epoch

Daily Highest Water

Range of Daily High Water



MHHW Part 2

Mean Higher High Water Elevations - NAVD88		
Location	Meters	Feet
Christina River	0.97	3.18
Red Lion Creek	0.92	3.01
Appoquinimink River	0.97	3.19
Murderkill River	0.84	2.75
Broadkill River	0.65	2.13
Rehoboth Bay	0.16	0.52
Indian River Bay	0.25	0.81
Atlantic Ocean	0.55	1.81



Vertical Datum Transformation

Source: VDatum
<http://vdatum.noaa.gov>



Inland Bays MHHW



Rehoboth Bay
0.5 feet NAVD88

Atlantic Ocean
1.8 feet NAVD88

Indian River Bay
0.8 feet NAVD88



The Process

- Light Detection and Ranging (LiDAR)
 - ✓ 2 meter Horizontal Grid
 - ✓ RMSE 15 cm (6 in) Vertical Accuracy
 - ✓ “Bare Earth” DEM
- Determine MHHW level for each Watershed
- “Flood” inland areas
- Re-introduce Bridges, Tidegates, etc
- Remove non-contiguous flooded areas



The Devil in the Details

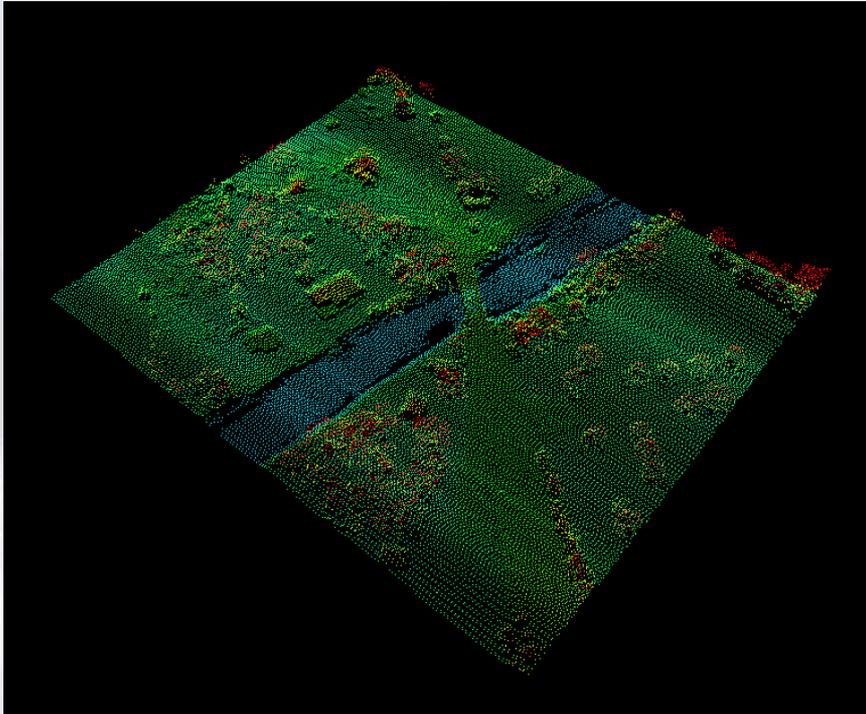
- Process included in metadata
- Disclaimer and caveats are also included



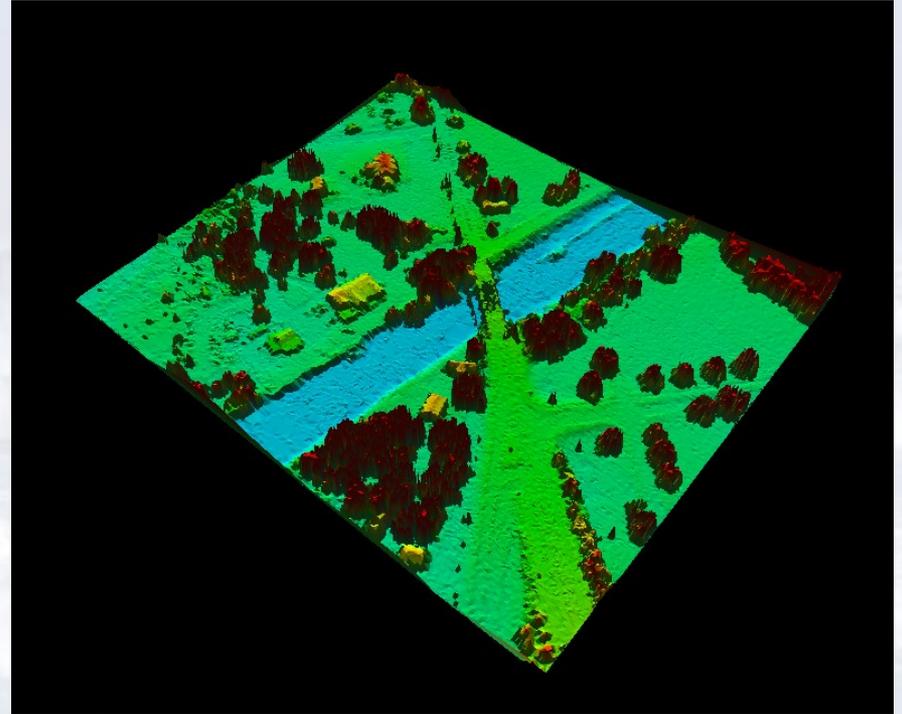
The Location



The LiDAR Data

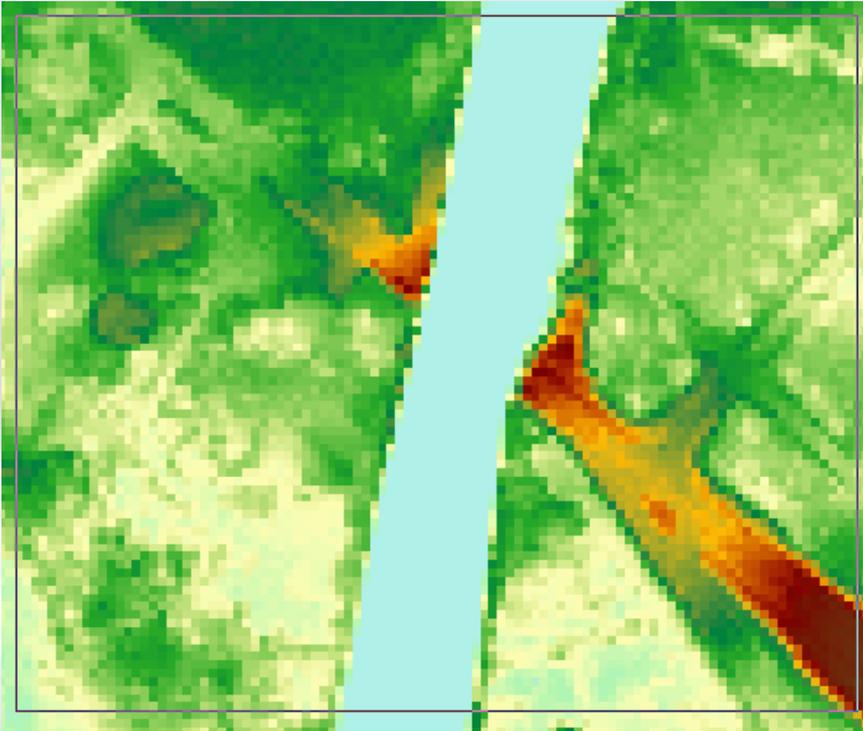


Raw LiDAR Data Points

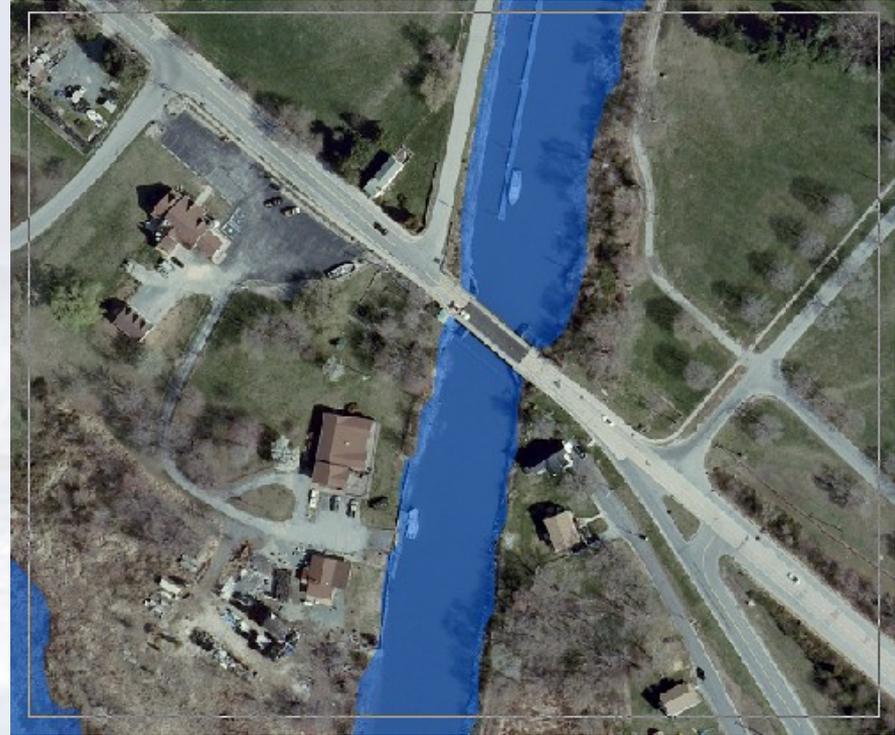


Raw LiDAR Surface

The Results

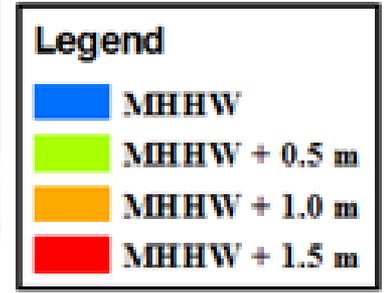
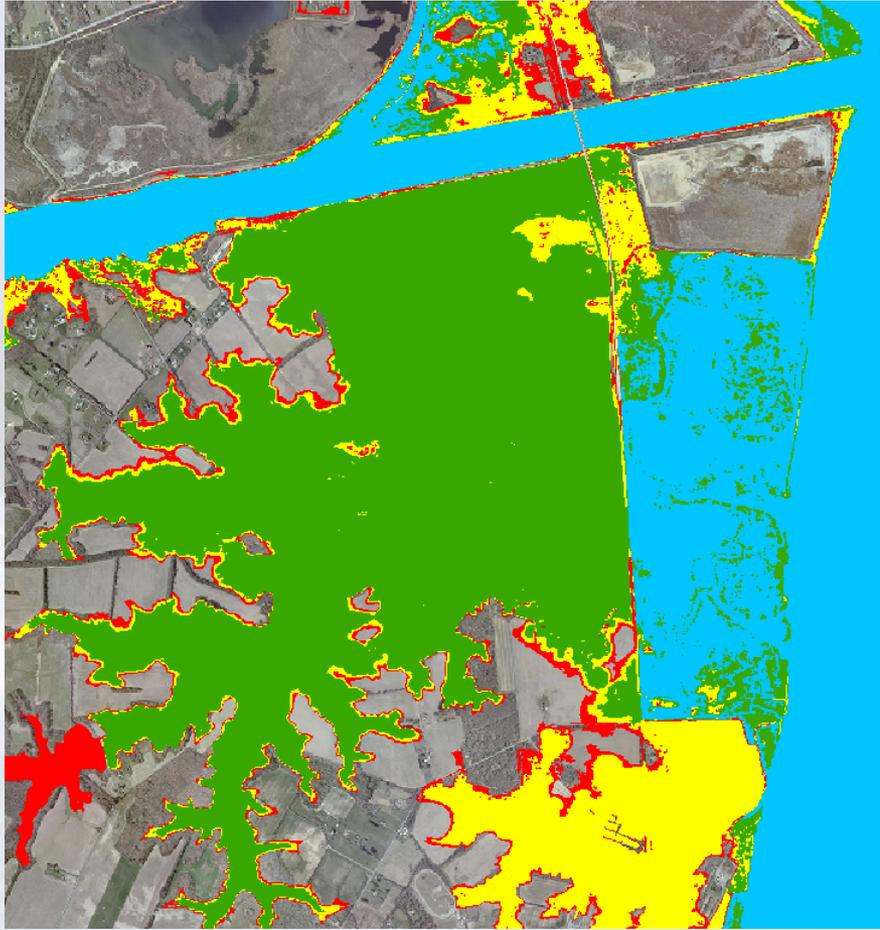


Bare Earth DEM



MHHW Inundation Map

1000 Acre Marsh Area



Next Steps

- Sea Level Rise Advisory Committee
- Vulnerability Assessment
- State Adaptation Plan



Sea Level Rise Advisory Committee

Comprised of a representative from each State of Delaware Cabinet Department and representatives from municipal governments, business advocacy organizations and citizen advocacy organizations.

- Delaware Department of Agriculture
- Delaware Department of Health and Social Services
- Delaware Department of Natural Resources and Environmental Control
- Delaware Department of Safety and Homeland Security
- Delaware Department of Transportation
- Delaware Economic Development Office
- Delaware Farm Bureau
- Delaware League of Women Voters
- Delaware Insurance Department
- Delaware League of Local Governments
- Delaware Nature Society
- Delaware Office of Management and Budget
- Delaware Realtors Association
- Delaware State Chamber of Commerce
- Home Builders Association of Delaware
- The Nature Conservancy
- The Office of the Governor
- Positive Growth Alliance
- Tidewater Utilities, Inc.
- University of Delaware



Vulnerability Assessment

Step 1: Identify Hazards



Step 2: Profile Hazards



Step 3: Inventory Assets



Step 4: Estimate Losses

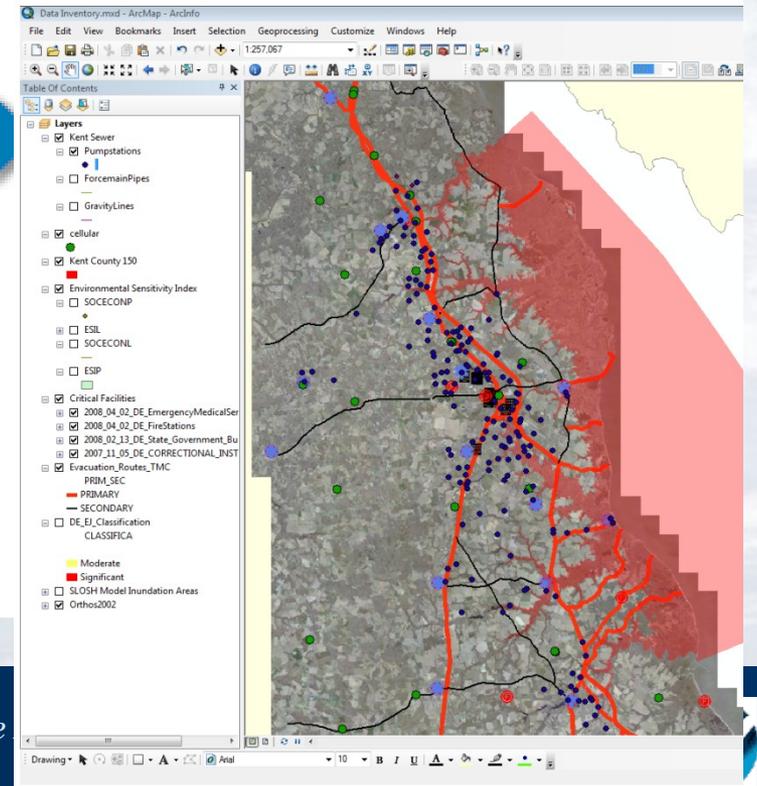


Step 5: Consider Mitigation Options



Sea Level Rise

SLR Scenario Layers



Vulnerability Assessment

- What types of data are we looking at?
- Expand to:
 - ✓ Societal Concerns
 - ✓ Economic Concerns
 - ✓ Environmental Concerns
 - ✓ Adaptation

Essential Facilities
(police and fire stations, schools, hospitals, emergency operations centers)

User-Specified Facilities
(government buildings, historical landmarks, stadiums)

Transportation Lifeline Systems
(road segments, bridges)

Hazardous Materials Facilities
(storage, industrial labs)

High Potential Loss Facilities
(dams, power plants, military bases)

Utility Lifeline Systems
(power lines, sewers and water mains)

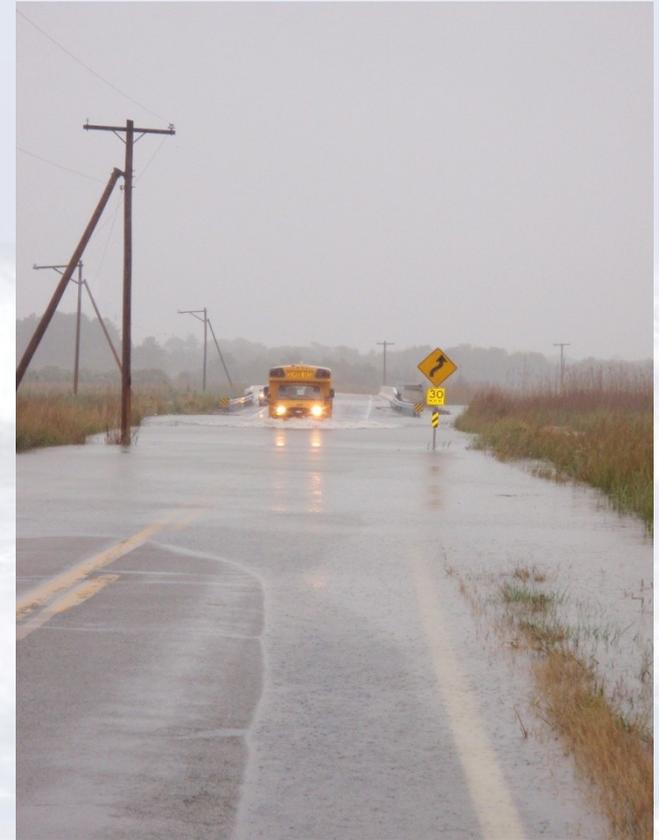
General Building Stock
(numbers of buildings, occupancy and construction classifications)

Demographics
(age, population, gender)

Odessa, Delaware



Rt. 9 Bridge/Old Corbitt Road over
the Appoquinimink River



Silver Run Road

Statewide Adaptation Plan

Delaware's adaptation plan will provide:

- an assessment of Delaware's vulnerability to the impacts of sea level rise
- a series of recommendations for policy improvements and best management practices
- Illustration of which geographic areas or topic areas require more attention or research



Summary

- DNREC Policy outgrowth of concern for increasing flooding events and long-term implications of rising seas
- Inundation Scenario Maps – tool for planning
- Vulnerability Assessment
- Statewide Adaptation Policy



Cool maps and all but what can I do with them?

See impacts to *your* program
Use them to plan *your* operations
Start planning for the future *now*



But ... how can I get them?



Thank You

Carl.Yetter@state.de.us

739-9283



Working with the ArcGIS API for JavaScript



YOU ARE HERE

Michael Townshend
Department of Natural Resources
and Environmental Control



Challenges

- Performance
- Integration of Delaware Common look and feel and sites with existing AJAX controls
- Ease of use
- Limited time for development
- Looking Forward

Performance



- Coastal Program Sea Level Rise data are complex
- Google Maps API mash-up proved to be too slow
- ArcGIS Server Multi Layer Cache was the answer



Integration

- Public facing must conform to the State's Common Look and feel
- Must work with existing javascript or AJAX pages
- For mash-up to work a cached map services must use same tiling scheme as base map.



Multi Layer Cache

Create Map Server Cache

Host
mapservices

Map Server
Campgrounds

Data Frame
Layers

Server Cache Directory
d:\arcgisserver\arcgiscache\

Tiling Scheme
 NEW
 PREDEFINED

Predefined Tiling Scheme (optional)
D:\arcgisserver\MapResources\StatewideCache10.xml

Tiling origin in map units (optional)
X Coordinate: 23000 Y Coordinate: 260000

Scales
STANDARD

Number of Scales
10

Scales (optional)

Scale

- 1000000
- 750000
- 500000
- 250000
- 100000
- 24000
- 10000
- 5000
- 2400



Multi Layer Cache

Dots(Pixels) Per Inch	96
Cache Tile Format (optional)	PNG24
Tile Compression Quality (optional)	0
Tile Width (in pixels)	512
Tile Height (in pixels)	512
<input type="checkbox"/> Antialiasing (Smooths edges of labels and lines for improved display quality) (optional)	
Cache Type(Optional)	
Cache Type (optional)	MULTI_LAYER
Input Layers (optional)	<ul style="list-style-type: none"><input checked="" type="checkbox"/> Closed Campgrounds<input checked="" type="checkbox"/> Buildings<input checked="" type="checkbox"/> Cabins and Yurts<input checked="" type="checkbox"/> Sites<input checked="" type="checkbox"/> Camping Areas
Select All	Unselect All
Add Value	



Standard Tile Schema

```
<?xml version="1.0" encoding="utf-8" ?>
- <TileCacheInfo xsi:type="typens:TileCacheInfo" xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
  xmlns:xs="http://www.w3.org/2001/XMLSchema" xmlns:typens="http://www.esri.com/schemas/ArcGIS/9.3">
- <SpatialReference xsi:type="typens:ProjectedCoordinateSystem">
  <WKT>PROJCS["NAD_1983_StatePlane_Delaware_FIPS_0700",GEOGCS
    ["GCS_North_American_1983",DATUM["D_North_American_1983",SPHEROID
      ["GRS_1980",6378137.0,298.257222101]],PRIMEM["Greenwich",0.0],UNIT
      ["Degree",0.0174532925199433]],PROJECTION["Transverse_Mercator"],PARAMETER
      ["False_Easting",200000.0],PARAMETER["False_Northing",0.0],PARAMETER["Central_Meridian",-
        75.41666666666667],PARAMETER["Scale_Factor",0.999995],PARAMETER
      ["Latitude_Of_Origin",38.0],UNIT["Meter",1.0],AUTHORITY["EPSG",26957]]</WKT>
  <XOrigin>-5423100</XOrigin>
  <YOrigin>-14209500</YOrigin>
  <XYScale>450267657.86718673</XYScale>
  <ZOrigin>0</ZOrigin>
  <ZScale>1</ZScale>
  <MOrigin>-100000</MOrigin>
  <MScale>10000</MScale>
  <XYTolerance>0.0001506381621185609</XYTolerance>
  <ZTolerance>2</ZTolerance>
  <MTolerance>2</MTolerance>
  <HighPrecision>true</HighPrecision>
  <WKID>26957</WKID>
</SpatialReference>
- <TileOrigin xsi:type="typens:PointN">
  <X>23000</X>
  <Y>260000</Y>
</TileOrigin>
<TileCols>512</TileCols>
<TileRows>512</TileRows>
<DPI>96</DPI>
- <LODInfos xsi:type="typens:ArrayOfLODInfo">
- <LODInfo xsi:type="typens:LODInfo">
  <LevelID>0</LevelID>
  <Scale>1000000</Scale>
  <Resolution>264.58386250105838</Resolution>
</LODInfo>
- <LODInfo xsi:type="typens:LODInfo">
  <LevelID>1</LevelID>
  <Scale>750000</Scale>
  <Resolution>198.43789687579377</Resolution>
</LODInfo>
- <LODInfo xsi:type="typens:LODInfo">
```



Ease of Use

- Easy map navigation
- Easy layer display control
 - The Coastal Programs liked the idea of a slider bar
- Easy access to scenario descriptions
- Easy to use Address matching



Development Time

- Time for development was at a premium
- Development had to be quick
 - Reuse as much as possible
 - Existing services
 - Base map
 - Orthophoto
 - Geocode
 - Existing code
 - Code samples from arcgis.com



Looking Forward

- Who is capable of building these applications?
- What is needed?
 - Web Server
 - Programming experience
 - Access to ArcGIS Server
- “Shared” ArcGIS Server for hosting centralized services and services for smaller agencies.
- How do we move forward? What decisions do we need to make as a group?



Questions to consider

- Do DGDC members:
 - Want access to a state hosted ArcGIS Server?
 - Want to access state hosted services from ArcGIS Desktop? Custom Web Apps using Esri APIs?
 - Have the programming experience or time to learn how to build mapping applications?
- Can the DGDC decide:
 - On a common projection for map services
 - DE Stateplane, Web Mercator
 - On a common tile scheme for cached services
 - Projection, tile size, origin, scale levels

Links

- <http://www.dnrec.delaware.gov/Pages/SLRMaps.aspx>
- <http://help.arcgis.com/en/webapi/javascript/arcgis/>
- <http://mapservices.dnrec.delaware.gov/ArcGIS/rest/services/StatewideCache/MapServer>
- michael.townshend@state.de.us