

Natural Resource Workgroup Members Present: Karen Bennett, Sarah Cooksey, Brenna Goggin, Susan Guiteraz, Roger Jones, Kevin Kalasz, Bill McAvory, Chris Sommerfield, Michael Stroeh, Hillary Stevens, Pam Thornburg, Robin Tyler.

REVIEW OF DATA NEEDED FOR NATURAL RESOURCES VULNERABILITY ASSESSMENT

Ag Land Preservation Districts

- This polygon is not all tillable land
- Would need to consult with property managers for specifics of what the polygons represent
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Wetlands

- Would be helpful to run analysis of most recent non-tidal wetlands data.
- Karen has updated Land Use/Land Cover information (from NOAA?)

Karen Bennett – Her office is trying to discern between high versus low marsh – and this indicates different habitat types. They have some interpretation on this, but still working to field validate. It would be important to explore data on this from a habitat perspective, and try to incorporate this in the vulnerability assessment. It may not be ready in time, but the caveats with this data could still be incorporated in a discussion section of the vulnerability assessment.

Wellheads and Recharge Areas

Are these topics more appropriate for the Society and Economy Workgroup to address? Or is it still appropriate for the Natural Resource Workgroup to address? (because there is overlap of development on recharge areas)

Sarah - It would be good to know what recharge areas are still undeveloped

- There was a big effort to protect well head areas with in DNREC, and it is coming back around.
- If the well head were to be flooded, then public drinking water could be contaminated.
- Need to clarify what a wellhead is, and the area around it.

**Would the wellhead layer include the agricultural irrigation well heads??? Or does this include private well heads?

- DNREC has this information

- There was a time farmers didn't need a permit for the installation of a well, so there may be some historical well information that may not be captured
- Abandon wells information should be included in the assessment as well. They are supposed to be capped when not in use. Could check in with DNREC about ones that were closed. But many have just been abandoned without record of existing/closing.

State Planning Investment Layers

- There are 4 state investment areas. Need to include layer 4 in the assessment, since it represents undeveloped or open space areas that are important to our natural resources.
- What is the value of looking at the State Planning Investment Layers?
 - May not be something our group needs to be concerned about. Level 1 and level 2 could be given to another group to work on.

Historical and Cultural Resources

- These are points on a map, not areas
- Should include archeology sites as well, but it would not be able to be shown publically on a map. Could be shown as a percent, but not exact points.

Natural Areas

- The locations and areas this data layer consists of should be clarified.
- These are areas that have been signed off as natural areas by DNREC, this is not a designation that has any legal implications, this information could include state park lands, developed areas, etc.
- Is there overlap between natural areas and state resource areas?
 - There can be overlap, but not necessarily
 - Is there value in this to our vulnerability assessment?
 - Yes, these areas typically represent the best of the best natural areas in Delaware
 - These areas are not necessarily protected
 - Ask Ron or Eileen Butler for more information about caveats and whether we should use this in the vulnerability assessment

Key Wildlife Habitats

- This represents the mapped Delaware Wildlife Action plan. Does not include rare plants, because Congress does not allow the Del. Wildlife Action plan to include plants.
 - Includes 4 components, large forest blocks, large wetland blocks, habitats of conservation concern (HCCs – high priority for wildlife, about 15-20, with precise mapping of HCCs, ex. Bald Cypress, salt marsh, etc. but hasn't all be ground truthed), species of greatest conservation need

(animals only, some are rare - S1 or S2, can include more common species that are not included in key wildlife GIS layer)

- Ask Karen for more details, Robert Cox

For Endangered or Threatened Species layer – needs to be clarified if this means state or federally listed species

Nature Preserves

Conservation Easements

This is just acreage, not specific habitat types

Is this the state holdings? Would it be helpful to have conservation easements that NGOs hold as well?

- Check with Parks, because they may already have this information from NGOs. Ron Vickers may have this.
 - Brandywine Conservancy may have some information
 - Delaware Wildlands
 - State Forest Service has easements as well. And they have statewide Forest Legacy areas (specific areas in the state), Priority Forest areas (throughout state)
- Are there any layers on preserved open space?
- There is a state protected areas layer, but it has not been analyzed yet. As well as state wildlands area layer (need to clarify if this is Delaware Wildlands' layer)
- Many layers need to be broken down so we understand specifically what and what is not in it. Some may be overlapped.

Wastewater Infrastructure

Not applicable

Impermeable Surfaces

Is this useful to our group?

- Could use this to infer developed areas.
- Could infer groundwater recharge or water quality
- How will we know when we have enough information to know when we can do the vulnerability assessment and the adaptation plan?
 - Once we have all the information, we will have a better idea of what the impacts of SLR will be, and then we can present this information to the larger group and then can start the vulnerability assessment.

***Mike Stroeh: Are barrier inlands captured in one of these GIS layers?

ASSESSMENT OF AVAILABLE DATA:

Statewide vegetation layer

Is this important to us?

- It is very detailed, includes LU/LC information, will be overlap with HCCs, some portions of state are not completely mapped. But high priority vegetation communities are mapped.
- Should talk directly with Karen about its details
- The Partnership for Delaware Estuary's vegetation layer is duplicative of this information, but the statewide vegetation layer is more up to date

Is “**map physical barriers to wetland migration**” important for the vulnerability assessment? This is more of a research question, and would not be able to be completed in time. It could be incorporated in a discussion section or in the adaptation planning section.

Are **wastewater and storm water structures** important to us? Could be more of an issue for the Infrastructure or the Society and Economy Workgroups

Would be helpful to have information about the **ownership of lands along the Delaware Bay**. Could help inform public and private landowners about adaptation planning.

Depth to water table

We do not have this information currently. What about this would be helpful? And Where can we get this from?

- Dr. Sommerfield - there is info from Delaware Geologic Survey about mean water table depths.
- This information ties in with salt water intrusion and recharge, drinking water sources.
- The group agrees we should seek out this information

Turbidity, nutrient changes and salinity: not available

Head of Tide:

- NOAA may have some data that this could be inferred by, but it would take some work
- Bill McAvoy: this also may be inferred by vegetation areas, could be seen from aerial photographs, but would take time to study.
- Dams or hard barriers could show the head of tide on rivers that have these.
- This information would be important to have at least something on

Increased extent of storm surge:

- Not looking into this because extra modeling would be required
- The vulnerability assessment should include a disclaimer that this was not taken into account due to time, but in the future the state should be aware of this impact

Fisheries info

- Kevin Kalasz has survey data of fresh water mussels.
- F&W has more info on this
- Ask Jeff Tinsman, cc' Craig Shirey

Site specific migration studies

Do we know if certain species of concern will be able to keep up with SLR?

Map physical barriers to wetland migration

Would this be too hard to map now? Yes it can be done, it is important, but it would not be able to be completed in time for the vulnerability assessment. It could possibly be ready in time for adaptation plan analysis.

Wetland to Forest migration maps from The Nature Conservancy

- This information is only available for New Jersey

Is there room in the vulnerability assessment for caveats about the data we have? To say this is what we were able to do with the data we have, but there is definitely other important topics/data that needs to be taken into account in any planning.

- Yes we will incorporate this into a discussion section.

The economic data of hunting and fishing.

- This information is out there from U.S. Fish and Wildlife service. The data would be helpful down the road, but it is not a GIS layer.
- Also need to get the economic value of birding.
- This would help us to get information on the economic loss of this recreation opportunity
- Info is google-able

Are **tax ditches and agricultural ditches** available on a GIS layer somewhere?

- Yes
- This information should be included in the vulnerability assessment

Salinity change is also important to understanding how habitat and vegetation will change.

- This change can even be seen in one growing season
- But how could this be showed graphically, the modeling of it could be too complex for this study.
- There should be a way to map a boundary or a range of it

Delaware Coastal Programs will be in contact with workgroup about next meeting date and time.

DRAFT