

CLIMATE CHANGE OUTREACH



Living Shorelines Workshop
December 13, 2011

Climate Change Outreach Research

Flesch-Kincaid Reading Level

$$0.39 \left(\frac{\text{total words}}{\text{total sentences}} \right) + 11.8 \left(\frac{\text{total syllables}}{\text{total words}} \right) - 15.59$$



WATER WORDS
THAT WORK

Climate change and global warming are the most politically polarizing environmental terms

Readability Statistics	
Counts	
Words	603
Characters	3115
Paragraphs	11
Sentences	25
Averages	
Sentences per Paragraph	3.1
Words per Sentence	23.4
Characters per Word	5.0
Readability	
Passive Sentences	8%
Flesch Reading Ease	44.2
Flesch-Kincaid Grade Level	12.6
OK	

Climate Change Outreach Roundtable



Maryland and Delaware Climate Change Education Assessment and Research



Weathering Change

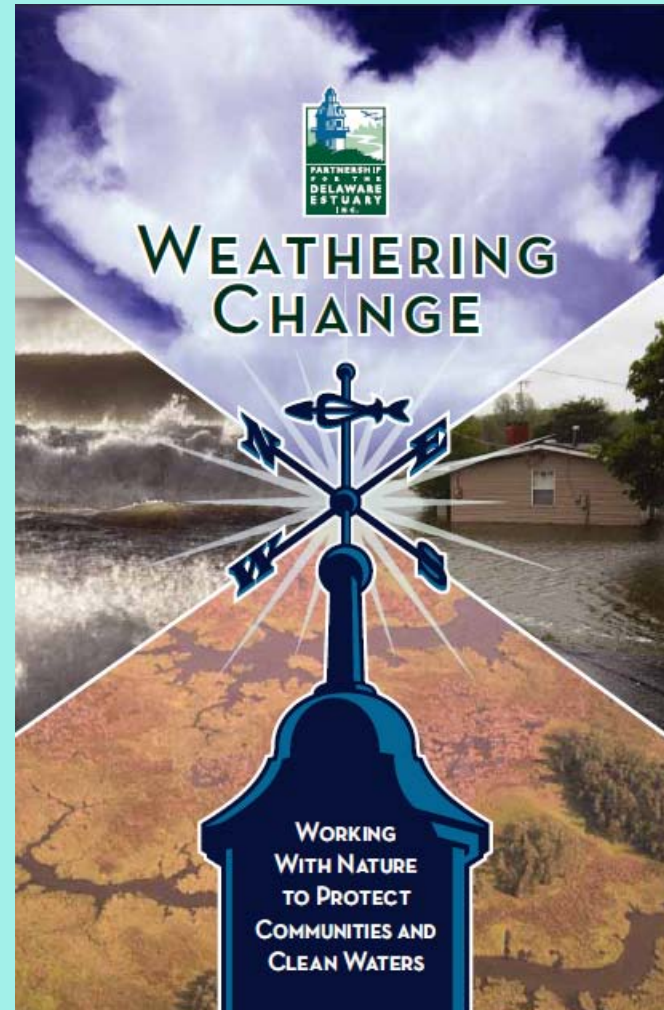
Climate Change and the Delaware Estuary

Three Case Studies in
Vulnerability Assessment and Adaptation Planning



A Publication of the
Partnership for the Delaware Estuary
A National Estuary Program

May 2010



WEATHERING CHANGE

WORKING
WITH NATURE
TO PROTECT
COMMUNITIES AND
CLEAN WATERS

THE DELAWARE ESTUARY WATERSHED:

6,500 square miles in New Jersey, Pennsylvania, and Delaware



Change is in the air...

...and on the land, and in the water. Science shows that we are experiencing gradual weather and water-related changes. Frequent and severe rain and snow storms with flash floods, hot and dry spells in the summer, and higher tides in coastal areas are on the rise and expected to increase in the near future. Local communities can protect their resources and quality of life by planning for these changes.

Over 6.4 million people...

...live and work along the tidal Delaware River and its streams, and this number will nearly double over the next century. Population changes, along with weather and water-related changes, will pose serious threats to our region's natural resources and challenge our economic and social norms.

Local communities are on the front lines dealing with increased snow removal budgets and repeated repair work on washed out roadways and other damaged infrastructure. Growing stormwater management demands, increased emergency planning needs, rising energy costs, and protecting clean drinking water supplies also pose challenges.

Here in the Delaware Estuary region...

- Average temperatures are expected to increase by **4 to 8 degrees** Fahrenheit over the next century.¹
- Population is predicted to increase **80%** by 2100.¹



Photo courtesy
of DNREC

*A flooded house in Kitts
Hummock, DE after a
May, 2008 storm.*



*The Chester Creek
in Aston, PA after an
October, 2010 storm.*



*Homes at risk on the
Delaware Bay in New Jersey.*

At Risk...

...are people, property, and clean water. Local community leaders face tough decisions in planning to protect and control the waters that sustain, and yet can threaten, the lives and livelihoods of the people in the region. Increasing precipitation falling on hard, man-made surfaces and buildings runs off and can create an onslaught of destructive storm water. Uncontrolled stormwater floods developed areas, wipes out natural habitats, erodes streambanks, damages property and community infrastructure, and pollutes streams and other drinking water sources.

Coastal communities face additional flooding challenges as sea level rises and storm surges increase.

Here in the Delaware Estuary region...

- Annual rainfall and snowfall are expected to **increase 7-9%** over the next century.¹
- Tidal waters have **risen a foot** over the past 100 years, and are expected to **rise another 2 to 5 feet** during the next century.¹

Cape May, NJ Desalinization of Wells

Overuse of groundwater in Cape May, NJ caused groundwater levels to fall below sea level and become contaminated by saltwater intrusion. Desalinization, the removal of salt, was determined to be the town's most cost-effective option. Total cost for the desalinization plant completed in 1998 was \$5 million, the largest capital improvement in Cape May's history, adding an extra \$85/year to average household water bills.

Over 15 million people...

...rely on the Delaware River and its tributary streams for clean drinking water. Drinking water intakes on tidal waters are at risk when salt water is pushed farther up the Delaware River. The salt line, where fresh and salt water meet, is affected by ocean tides, storm surges, sea level rise, droughts, and the removal of fresh water for industry and people. Fresh water in underground pools (aquifers) that is replenished by a tidal river or stream is also at risk from salt water intrusion. Change in water salinity impacts family farms, natural habitats and wildlife that depend upon fresh water. Many plants and animals cannot tolerate even small salinity changes in the water they depend on for survival. Desalinization, the removal of salt from drinking water supplies, is very expensive.



Here in the Delaware Estuary region...

- The Delaware Estuary watershed covers just 0.2% of the continental United States, yet supplies drinking water to **2% of the U.S. population**, worth billions of dollars.²
- Farms in our region depend upon clean, fresh water supply and they generate **over \$2.5 billion** in the local economy.²
- Extremely sensitive to changes in water salinity, the oyster industry in the Delaware Bay has an economic impact of **millions of dollars** annually.³



F



Work with Neighbors

Municipal leaders, residents, and businesses can work together to meet the challenges of changing weather and water conditions.

- Encourage tree planting and the creation or protection of natural areas (F) on developed properties.
- Encourage people in your community to install rain barrels (G), downspout planters, and rain gardens to reduce excessive runoff from their properties.
- Use your community's existing communications (newsletters, bill mailings, websites, and annual reports) to highlight green projects and talk about community water conservation efforts.
- Stretch your dollars by partnering with your local watershed organization on projects and public outreach efforts.
- Work collaboratively with upstream and downstream towns to implement larger and/or multiple projects to significantly improve stormwater control in your watershed. We all live downstream!

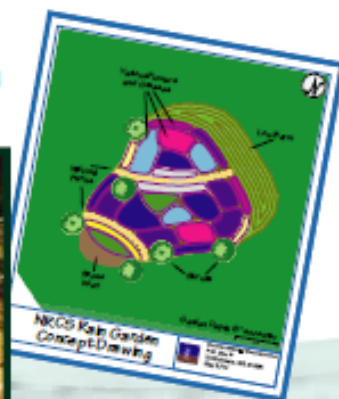
G



Plan for Change

Ben Franklin once said, "An ounce of prevention is worth a pound of cure"—still true today in planning for water quality and community protection in changing times. Planning costs very little, but reactive measures as problems develop can be extremely expensive.

- Look at existing zoning, land use, comprehensive, and hazard/emergency plans and update them to take increasing temperature, precipitation, and sea level conditions into consideration.
- Work together, across zoning, planning, and public works departments to update codes to accommodate and encourage installation of absorbent green stormwater management practices.
- Keep development away from any land that is expected to erode and/or flood to protect public safety, property and other community assets.
- Protect wetlands, streamside forests, and any natural areas existing between them and developed land – they are the best natural defense against flooding in developed areas.
- Require use of green infrastructure for stormwater control in new and expanding land development.



Community Pledge



Weathering Change Pledge

The climate is changing around the world with unique impacts here in the Delaware Estuary watershed. More frequent and severe rain, storms and flooding, hot and dry spells in the summer, and higher tides in coastal areas are all on the rise. If we work together to respond to these changes, we can create safer communities, protect our built infrastructure, and preserve the natural areas we rely on for clean water and healthy communities.

I, _____, a representative of _____ pledge to:

- **Identify built infrastructure at risk in my community.** (Infrastructure at risk to climate change impacts includes roads, water systems, and structures in low-lying areas or flood-prone areas.)
- **Identify the natural assets in my community that are most important and/or at risk.** (Natural features like tidal wetlands, floodplains, and forests on streambanks can help protect communities from climate change impacts, but are also at risk.)
- **Identify actions my community can take to adjust to a changing climate.** (Actions like setting built infrastructure back from wetlands, floodplains, and streams, and promoting healthy streamside forests and tidal wetlands can help communities minimize risk.)
- **Help my community plan for the future.** (Incorporating climate change into planning and addressing changing conditions in plans and ordinances as they are updated can help prepare communities for change.)

Signature _____ Date _____

If applicable: This pledge corresponds with municipal resolution _____ as passed _____

☐

The Partnership for the Delaware Estuary will feature all signees on its website. Please check the box at left to be eligible for additional public recognition organized by the Partnership for the Delaware Estuary, such as press releases.

Coming soon...

Weathering Change Pledge

for Municipalities

Delaware Estuary Living Shorelines Initiative



Delaware Estuary Living Shorelines Initiative



- Environmental Professionals Workshops
- Community Workshops

Delaware Estuary Living Shorelines Initiative

New Jersey
Delaware
Pennsylvania

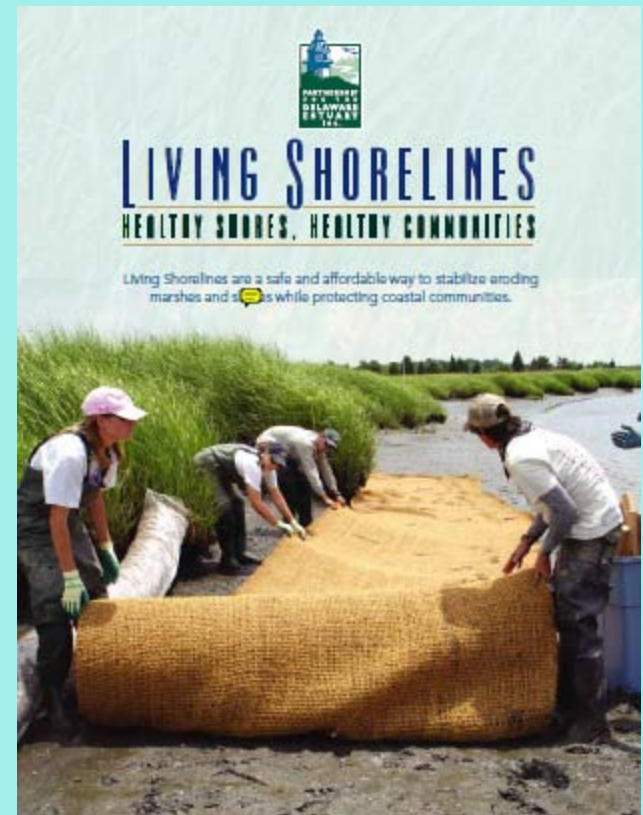
- Community Workshops

- ☐ Will be held next spring
- ☐ For regulators and communities alike
- ☐ Locations based upon identified Areas of Interest
- ☐ Will include a site visit

Living Shorelines Introductory Brochure

Please take the time to review the Living Shorelines Brochure and fill out the workshop evaluation

- Anything missing?
- Any unclear text or graphics?



Summer 2012 Regional Climate Change Conference

Goal: To create a regional vision for climate change adaptation



CLIMATE CHANGE OUTREACH



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