

**INSIDE:** Delaware Tackles Sea Level Rise • Impact of Wind Power • Legal Tools to Protect the Shore • And More

# Delaware Lawyer

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One reality is emerging from the seemingly endless climate change debate. While argument over the existence and cause of climate change remains a popular form of political sport, the reality is that the federal government and some states are taking action to address climate change. Legislatures and regulatory agencies move forward on the basis that global warming and sea level rise are ongoing and imminent. Indeed, the most immediate impact of climate change may be in the form of new laws and regulatory programs designed to anticipate or mitigate the effects of sea level rise and related climate change phenomena.

At the state level, the Delaware Department of Natural Resources and Environmental Control (DNREC) formed a Sea Level Rise Advisory Committee in 2010 to assess impacts to potentially vulnerable infrastructure and land uses. That committee has formulated dozens of recommendations for possible adaptation measures. At the federal level, the Biggert-Walters Act of 2012 made significant changes to the federal flood insurance program, which has increased premiums for many owners. In many sectors, the specter of climate change and sea level rise is driving legislative and regulatory change, with legal and economic consequences.

In our introductory article, DNREC Secretary Collin O'Mara offers his perspective on climate change and sea level rise, chronicles the work of the sea level rise advisory committee, and discusses the recommendations of the committee and the work yet to be accomplished.

In our next article, Professor Ken Kristl of the Widener University School of Law surveys the legal and regulatory tools that are available to address sea level rise in Delaware, and identifies areas in which new or different legal tools may be required.

Any discussion of climate change and sea level rise would be incomplete without some consideration of energy policy and renewable energy sources. Jeff Thaler, a professor at the University Of Maine School Of Law, shares his perspective on the role of ocean wind power, with an interesting analysis of the application of the public trust doctrine.

Finally, Greg Inskip provides an informative and sobering view of some of the potential impacts of wind energy, illustrating among other things that no energy policy choice is free from benefits and risks.

Although scientific inquiry continues and political argument over climate change rages on, the legal and regulatory landscape is already changing, and the impacts on property ownership, land use, and government spending will become more significant in years to come.



Robert W. Whetzel

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## Gregory A. Inskip

graduated from Yale University and Harvard Law School. He is a member of the Bars of

the Delaware Supreme Court, the Delaware District Court, the federal Courts of Appeals for the Third and Fourth Circuits, and the United States Supreme Court. His practice over 36 years included commercial litigation and representation of public utility companies and ratepayers before the Public Service Commission of the State of Delaware and in the Delaware courts. Mr. Inskip currently serves on the Board of Editors of *Delaware Lawyer* and as Vice President of the Board of Trustees of the Delaware Museum of Natural History. He is a Fellow of the Delmarva Ornithological Society, and has published articles on nesting Cooper's Hawks in New Castle County, resident Peregrine Falcons in

the City of Wilmington, and wintering Golden Eagles in Dorchester County, Maryland. He is a past recipient of the Delaware Nature Society's Conservation Award.



## Kenneth T. Kristl

is an Associate Professor of Law and the Director of the Environmental and Natural Resources Law

Clinic at the Widener University School of Law. He is a 1981 *magna cum laude* and Phi Beta Kappa graduate of the University of Notre Dame, and a 1984 graduate of the IIT/Chicago-Kent College of Law, where he was Editor-in-Chief of the *Chicago-Kent Law Review* and graduated first in his class. He is licensed to practice in Illinois (1984), Pennsylvania (2008) and Delaware (2008).

nation's first HomeStar program. Under Sec. O'Mara's leadership, Delaware has made great strides in preparing for rising sea levels and the impacts of climate change. He is the Chair of Governor Markell's *Committee on Climate and Resiliency* that oversees the development of an implementation plan that maintains and builds upon Delaware's leadership in reducing greenhouse gas emissions. The Committee develops agency-specific actionable recommendations for improving Delaware's preparedness and resiliency to climate change. Sec. O'Mara also serves as Chair of the Regional Greenhouse Gas Initiative Board of Directors and is a member and Past Chair of the Ozone Transport Commission, among other organizations.



## Jeff Thaler

is Visiting Professor of Energy Policy, Law & Ethics at the University of Maine and the Maine

School of Law, as well as Assistant University Counsel for environmental, energy and sustainability projects. Professor Thaler has been developing and teaching courses on Renewable Energy Law, Energy Economics and Law, Administrative Law, and Climate Change Law and Policy. He graduated *magna cum laude* from Williams College and from Yale Law School. Before joining the University, he developed over several decades a wide-ranging legal practice focusing upon environmental and energy permitting, compliance, enforcement and litigation. He has been permitting counsel for on-and off-shore wind and hydropower, and continues as legal counsel for the existing and proposed floating deepwater windpower projects in the Gulf of Maine. He also was, with Steve Herrmann and Bob Whetzel, one of the founders of the American College of Environmental Lawyers and its third President.



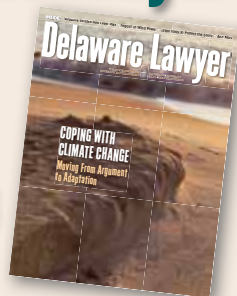
## Collin O'Mara

serves as Secretary of the Department of Natural Resources and Environmental

Control for Delaware Governor Jack Markell. He is the chief steward of Delaware's natural resources and oversees implementation of the Governor's goal to make Delaware a leader in the global clean energy economy. Sec. O'Mara has worked to modernize Delaware's energy sector – reducing pollution, stabilizing costs, improving reliability, and seizing economic development opportunities. He negotiated the shutdown of the state's most polluting coal units, facilitated switch-fueling of units, oversaw installation of cutting-edge pollution controls, and is facilitating a wide range of renewable energy projects. He led an aggressive energy efficiency campaign in collaboration with Delaware's Sustainable Energy Utility and local utilities, including implementing the

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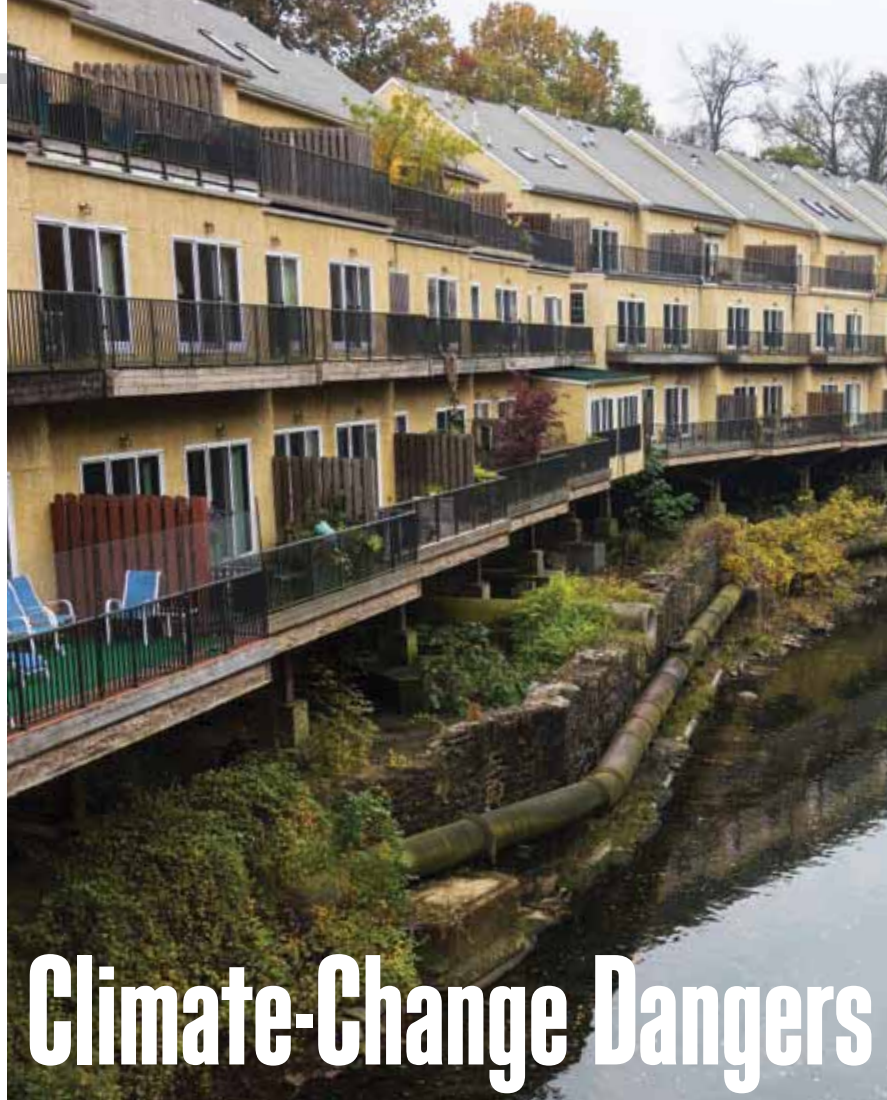
Collin P. O'Mara

*Delaware Secretary of Energy & Environment*

Delaware Department of Natural Resources  
and Environmental Control

# A Proactive Plan for Climate-Change Dangers

Delaware's  
comprehensive,  
visionary approach  
is mitigating the  
potentially devastating  
impacts of sea level  
changes and extreme  
weather events.



A little more than a year ago, Superstorm Sandy was on track to make landfall in Delaware. State and local agencies coordinated to execute the regional evacuation order issued by Governor Jack Markell as the state experienced heavy rains and gale force winds, which eroded beaches, flooded out communities and breached coastal defenses.

**W**hile we suffered only a fraction of the damage experienced by our neighbors to the north, the storm proved to be, as the Governor said, “a wake-up call.”

Recent storms and scientific assessments all highlight the threats to Delaware's communities, economic drivers and quality of life posed by extreme weather events, sea level rise and other climate impacts.

We know that:

- As a low-lying coastal state, Delaware is highly vulnerable to these extreme storms and sea level rise.
- Delaware's coastal defenses effec-

tively protect billions of dollars in assets, but some of the strategies we've relied on are not sustainable and require new approaches.

- Some existing public policies reduce risks while others contribute to what we now recognize as preventable damage.
- Making Delaware more resilient will require both investing strategically in capital projects and modernizing policies at all levels of government.

Preparing for these emerging challenges raises virtually every public policy question imaginable: What is the

appropriate role of government? Who should pay for different types of investments? Should public investment decisions be made strictly upon economic cost-benefit analyses? Should taxpayers be responsible for protecting or compensating individuals who make decisions that put them in harm's way? Should a state government pay for costs that are a direct result of local government decision-making? How should policies balance collective health and safety concerns with individual property rights? Do past types of actions compel government to sustain similar service levels indefinitely? How should government incorporate scientific projections into current day policies?

These are complex questions and only the tip of the metaphorical melting iceberg.

At the same time, it is nearly impossible to address these questions without considering the current political context. A sustained national misinformation campaign has made some Americans and public officials question the global scientific consensus that surrounds climate science.

Also, a slower-than-anticipated economic recovery and different anticipated impacts on different regions with different energy resources has allowed opponents to characterize taking action against these impacts as something that we cannot afford at this time.

Further, at a time when state and local government budgets are constrained, many key preventive actions have upfront costs and primarily long-term benefits, which require consideration of a temporal horizon that significantly exceeds electoral calendars.

All of this has confused voters and made it more difficult nationally to enact changes that are warranted by scientific findings. Climate change is still abstract for many families whose focus is on putting food on the table and their children through school. And, while recent storms have made us face up to their potential long-term devastation, the challenge is not always linked in

people's minds – and, if anything, may be made more complicated through the difficulty in establishing a causal relationship between greenhouse gas emissions increases and any single extreme weather event.

All that said, recent storms, drought conditions and heavy precipitation is crystalizing for Delawareans that climate change is not some far-off possibility that will only affect their grandchildren's grandchildren – it will affect everyone, contemporarily, in frequent but unpredictable ways.

Recent damage illustrates that the cost of inaction will be significantly greater than cost-effectively reducing emissions to reduce future impacts (some level of impact is likely unavoidable as a result of existing greenhouse gas concentrations).

Despite challenging national politics, Delaware has demonstrated leadership by taking several steps to address the state's many vulnerabilities, ranging from near-term extreme weather events – including nor'easters, hurricanes and heavy precipitation/flooding – while also preparing for longer-term sea level rise, increased temperatures/precipitation and impacts to our water supply. These impacts will affect public health and safety, as well as key industry sectors, especially agriculture, tourism and manufacturing.

Delaware's strategy for addressing these vulnerabilities begins with science and economics.

With the lowest-mean elevation of any state in the nation, a large proportion of Delaware's coastal and riparian corridors are affected by a combination of erosion, subsidence and inland flooding – all of which will be exacerbated by storms and sea level rise. Assessing the state's vulnerabilities and pinpointing the more susceptible spots is critical.

In 2010, DNREC formed a Sea Level Rise Advisory Committee to assess impacts to more than 70 different types of infrastructure vulnerabilities at various sea level rise scenarios and to develop recommendations for prioritizing

and responding to the most significant threats. The assessment showed that 11 percent of the state's land mass and 99 percent of tidal wetlands will be impacted (these areas also serve as a proxy for the areas that are most at-risk from extreme weather events).

The most vulnerable areas included:

- **Coastal and Inland Bays communities and beach-related tourism assets:** Ocean beaches, Bay beaches and Inland Bays communities
- **Physical coastal defenses:** Dikes, dams, impoundments and drainage systems
- **Transportation infrastructure:** Roads, bridges and railroad lines
- **Industrial areas:** Coastal manufacturing sites including the Port of Wilmington
- **Wetlands and wildlife habitat:** Wetlands are the most effective natural defense
- **Water infrastructure:** Septic systems, wells and distribution systems
- **Contaminated sites:** Superfund and brownfield sites from which pollution could spread

The committee put forth 55 recommendations that provide a road map to resiliency, including adoption of an Executive Order, which became a portion of Executive Order 41 recently signed by the Governor. Other recommendations from the committee include:

- Improving communication and coordination between state, federal, local and regional partners to streamline adaptation efforts
- Providing increased regulatory flexibility for adaptation and improving consistency between regulatory agency decisions
- Providing consistent/predictable policies for future growth, investment and natural resource management
- Increasing public awareness of sea level rise through education, outreach and marketing
- Identifying funding for adaptation planning and implementation projects



- Improving the availability and robustness of sea level rise data sets to help provide technical assistance to partners for assessing vulnerability adaption strategies
- Increasing understanding of the cost of non-action vs. adapting (socio-economic benefits)

DNREC is also developing a statewide climate change impact assessment that includes temperature and precipitation climate projections specific to Delaware. Projected changes in precipitation indicate that Delaware faces an increase in extreme rain-related events. Utilizing this information can help Delawareans prepare for the impacts of heavy downpours and prolonged storms.

The Delaware National Estuarine Research Reserve, under DNREC's aegis in partnership with NOAA, is serving as a national "sentinel" site for climate change impacts. DNERR scientists are collecting baseline and monitoring data on vegetation changes, marsh sediment changes and bird abundance. This long-term data set will help coastal managers understand how climate changes are impacting our important estuarine habitats so that managers can develop action plans for those changes.

The data generated through these efforts are helping to drive investments and identify policies requiring updates.

### Physical Infrastructure

Delaware's investments in physical infrastructure are driven by the policy principal that public funds should be focused where there is a clear public benefit. Where the benefit is unclear or largely accrues to private individuals, DNREC is conducting rigorous economic analyses to compare anticipated benefits and costs of projects. When projects would have a primarily private benefit, DNREC is proposing that investments should require an appropriate cost-share.

Driven by the scientific assessment of key vulnerabilities, Delaware is undertaking a range of infrastructure projects

that will make Delaware's communities more resilient including:

- **New Castle County dikes:** The reconstruction of flood-control dikes in New Castle County heavily damaged by Hurricane Sandy has been a top priority for DNREC. Five dikes will be reconstructed, including Red Lion Creek Dike, which protects a heavily contaminated industrial area.
- **Statewide dams:** DNREC has made repairs to several dams in the past year including Trap Pond, Silver Lake Milford and Garrisons Lake; it also developed engineering designs for improving eight additional dams beginning in 2014.
- **South Wilmington/Southbridge wetland:** DNREC is proactively working with the City of Wilmington to restore the South Wilmington Marsh, a key component of an overall strategy to alleviate flooding in the Southbridge neighborhood that is a result of rising sea levels, storm surge and antiquated drainage and sewer systems. This urban area was hit hard by tidal flooding during Superstorm Sandy, and again in December from another coastal storm. DNREC is providing funding for purchase of lands for this project.
- **Ocean coast nourishment and protection:** DNREC is partnering with the US Army Corps of Engineers (USACE) to bring the federal/state beach nourishment projects back to their design templates, using funding from the Congressional Supplemental Appropriation following Superstorm Sandy. Projects at Lewes (technically a Bay beach), Rehoboth/Dewey, Bethany/South Bethany and Fenwick Beaches are adding sand to the beach and dune where necessary to meet the federal design template. Efforts are also restoring lost or damaged dune grass, fencing and dune crossovers. DNREC beach crews have worked uninterrupted to shape dunes, replace sand fence and perform ocean beach maintenance activities for 20 miles

of state-maintained ocean coast beach.

These projects all exceed the federal cost-benefit test to justify public expenditures. The nourishment phase will add 1.3 million cubic yards of sand at a cost of approximately \$20 million.

The USACE is also using Sandy funding for nourishment along an approximately one-mile stretch of beach immediately north of Indian River Inlet, as well as fixing an apparent failed section of the jetty on the north side of Indian River Inlet which is allowing sand to leak from the beach back into the inlet. This project will add more than 500,000 cubic yards of sand to that stretch of beach at a cost of nearly \$7 million.

- **Delaware Bay beaches:** With the exception of Broadkill Beach, the Bay Beach communities do not qualify for USACE assistance because they do not meet the federal cost-benefit test. DNREC has conducted extensive economic modeling in some of these areas, and less than 25 percent of the benefit from most projects accrues to the general public for recreational or economic benefit with the vast majority benefitting property owners adjacent to the nourishment projects.

The state is working with USACE to construct a more protective dune system at Broadkill Beach by beneficially reusing sand that will be removed during the Corps' Delaware River main channel deepening project. The state is also working closely with the US Fish and Wildlife Service (USFWS) as it plans for resolution of marsh restoration in Prime Hook National Wildlife Refuge, which is also anticipated to have protective benefits when the project begins in the fall of 2014.

For the Bay beaches that are ineligible for USACE assistance, DNREC is providing protection through smaller truck-fill projects and is working with State Legislators

and local communities to determine the appropriate level of public funding of larger nourishment projects.

The state is also working to find creative solutions in which sand from a waterway maintenance project that has a clear public benefit can be beneficially reused to help improve community resiliency. As part of the state's regional sediment management approach, DNREC completed an innovative project in the Inland Bays to use sediment from the Pepper Creek dredging to restore a sediment-starved marsh. Applying the lessons from this project, we will next undertake a larger project at Bowers Beach and South Bowers Beach using sand from the Murderkill River entrance navigation project to bolster the sand dunes in those communities – effectively addressing two challenges at once.

- **Coastal impoundments and critical habitat:** Coastal storms have repeatedly damaged and weakened Delaware's impoundments, which protect communities and provide vital habitat for significant numbers migratory birds along the East Coast, including many of our prized waterfowl such as the American Black Duck and Northern Pintail, and our at-risk shorebirds such as the Red Knot. Many of our impoundments provide mosquito control and flood control functions and protect property and transportation infrastructure, especially along Route 9. DNREC is working with the USFWS to identify specific urgent repairs and adaption measures needed to protect our coastal impoundments from catastrophic structural failure threatened by future storms, including water-control structures and levees that must be repaired or replaced, and levees and shorelines that need to be stabilized, reinforced and restored to withstand the effects of storm events in the near term.

In addition, DNREC is working to stabilize and restore Mispillion Har-

bor near Slaughter Beach. The harbor is vitally important to migrating shorebirds, including the imperiled Red Knot, which feed on the dense supply of horseshoe crab eggs found on the harbor's beaches. The harbor and Mispillion Inlet also support passage of recreational and commercial fishing vessels as well as Delaware Launch Service vessels, the latter of which supports shipping and commerce in the Delaware River's main channel. The harbor's sea wall and shoreline need to be repaired and stabilized, and the beaches nourished. Living shoreline techniques and other measures to restore the harbor are also planned in collaboration with conservation partners.

- **Drainage and community flooding response:** DNREC continues to manage the state's drainage program and the 21st Century Fund, in partnership with the Conservation Districts. In 2012, the Department worked with the General Assembly to prioritize key regional projects and focus funding in areas with the greatest needs. This has led to the assessment and development of several projects, including projects in the Bay Beach communities, the Inland Bays, along the Red Clay Creek and Upper Christina River, and in municipalities such as Dover and Delaware City.

- **Water infrastructure:** A sustained focus over the past four years has connected households with more than 80 percent of the septic systems most at-risk of flooding in the Inland Bays to central sewer systems. In addition, the newly constituted Water Infrastructure Advisory Council is increasingly considering system resiliency as part of its deliberations when recommending funding for various drinking water, wastewater and stormwater projects.

- **Local government grants:** To help municipalities prepare for and reduce impacts from coastal storms in Delaware, DNREC's Delaware

Coastal Programs provides financial and technical assistance.

## Policy Implementation

While much of the public attention focuses on physical assets, DNREC is also engaged in important work to modernize policies that will reduce future damage and help mitigate climate impacts. Key policies include:

- **Stormwater management:** After a six-year stakeholder process, DNREC promulgated final stormwater regulations last year. The regulations were overhauled to reduce flood damage and maximize co-benefits of improved water quality by shifting from proscriptive programs to a performance-based standard that developers can meet more cost-effectively. The flexibility created by this change will move many developments away from large retention ponds towards more integrated stormwater management, including natural infrastructure such as rain gardens and bio-swales, which can reduce the volume and velocity of stormwater, while also purifying water resources.

- **Drainage codes and floodplain standards:** Following passage of Senate Bill 64 in 2011, DNREC empaneled a Floodplain and Drainage Advisory Committee to develop common-sense recommendations, draft a model ordinance for consideration of local governments, and to work with communities and FEMA to review all existing local floodplain management regulations and promote the adoption of more protective standards.

- **Wetlands:** DNREC also recently empaneled the Wetlands Advisory Committee as established through Senate Bill 78 to identify best practices, including both incentive-based and regulatory, to conserve and restore wetlands, which have the capacity to reduce flood/storm damage by retaining 300,000 gallons of water per acre.



• **Executive Order 41:** DNREC assisted the Governor in the preparation of EO 41, which includes a directive to ensure that state projects are designed to be resilient to the impacts of flooding, extreme storms and sea level rise.

• **Regional sediment management:** DNREC is working with the USACE and Delaware's Congressional Delegation to encourage integrated waterway navigation and flood abatement projects by using both sand and silty material removed from waterway maintenance projects to restore beaches and marshes. This approach reduces costs compared to doing projects separately and is a more effective way to sustain our coastal sediment resources.

• **FEMA programs and updated floodplain maps:** DNREC is working with flood-prone communities to identify the most severely impacted areas and structures toward imple-

menting FEMA-funded flood mitigation projects such as acquisition, elevation and structural drainage and flood abatement. The department is also working with FEMA and the USACE to produce, review and deliver new floodplain maps for the entire coastal area of Delaware. These new maps are preliminary but expected to become effective in mid-late 2014.

• **National Flood Insurance Program:** DNREC is working with local communities to educate residents, insurance agents, community officials and other groups on the changes to the National Flood Insurance Program which are the result of the federal Biggert-Waters Act of 2012.

None of this is to suggest that the nation or the world can simply adapt our way out of this challenge. But adaptation is paramount, and nowhere better illustrated than in Delaware where we

have collectively reduced greenhouse gas emissions by a greater proportion than any other state over the past four years – by cleaning up power plants, fuel switching to gas, adopting renewables and promoting energy efficiency.

Despite leading by example, Delaware produces less than 1 percent of national emissions, so our future is inextricably tied to whatever progress is made nationally and internationally.

The efforts underway across the state are making Delaware more resilient. Yet inadequate resources are available for addressing all of the challenges throughout the First State. This requires Delaware to make allocation decisions for scarce resources based not on politics as usual, but based upon sound science and economics.

By taking concrete steps today with smarter infrastructure and modernizing policies, we can be more prepared than other states and enjoy a competitive advantage for years to come. ♦

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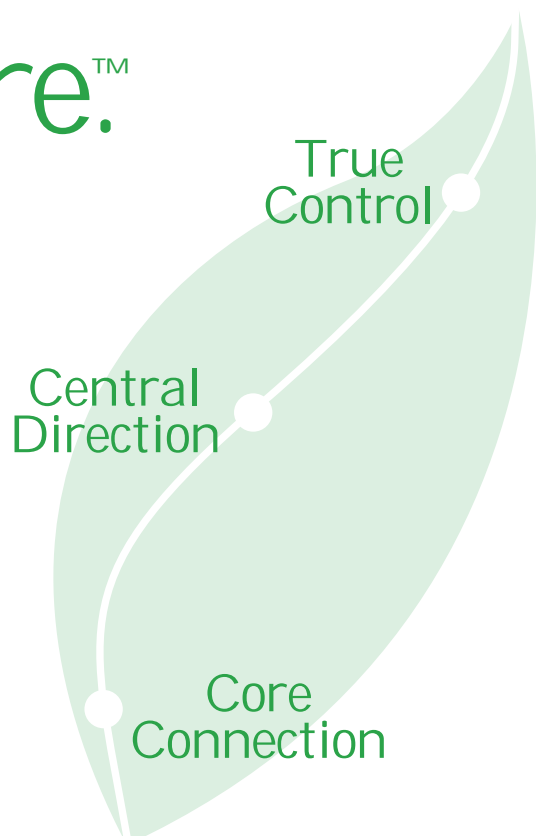
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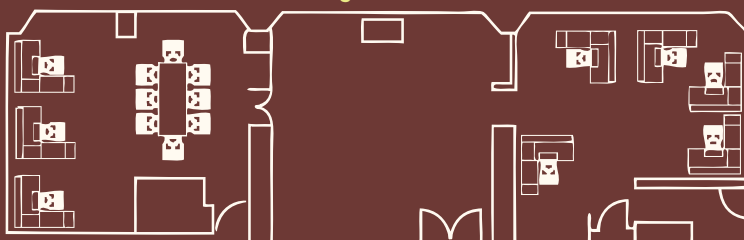
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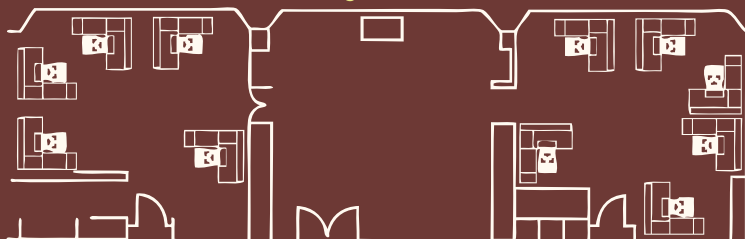


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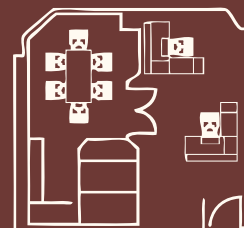
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# Rising Sea Levels: A Tidal Wave of Legal Issues?

How Delaware policy and our legal community respond to the impact of rising seas will be one of the century's significant challenges.

In its July 2012 Report, *PREPARING FOR TOMORROW'S HIGH TIDE: Sea Level Rise Vulnerability Assessment for the State of Delaware (Vulnerability Assessment)*,<sup>1</sup> the Delaware Sea Level Rise Advisory Committee looked at the effects of sea level rise in Delaware by the year 2100 of 0.5 meters (1.6 feet), 1.0 meters (3.2 feet) and 1.5 meters (4.8 feet).

The report lists numerous impacts that such sea level rise could cause, including the inundation of between 8 and 11% of the state's land area (including wetlands).<sup>2</sup> Significant economic assets would be affected.<sup>3</sup> With inundation, economic activity on the property is disrupted or must end, causing public and private investments and valuable tax base to literally fall into the sea. Thus, sea level rise will have a significant impact on land in Delaware and the owners of those lands.

How Delaware will respond to rising seas will be a significant (if not the most important) public policy decision in the 21st century. There are a number of different possible responses to

this developing problem. Almost all of these responses involve legal tools that will require the direct involvement of Delaware lawyers in order to sort out how those tools will work for the many public and private clients impacted by the sea's relentless rise. This article will frame the issues that will likely keep Delaware lawyers busy for years to come.

## The Undercurrent: General Legal Issues In Play When Sea Levels Change

Coastlines are dynamic features that change over time. Sometimes the tides deposit soil or sand onto the land; other times it washes soil away. Sometimes the water level recedes, exposing previ-

ously submerged lands; other times the water level rises, submerging previously dry land. Since Roman times, the law has recognized these dynamic processes and created both terminology and general rules to govern the ownership of the lands at and near the water's edge.

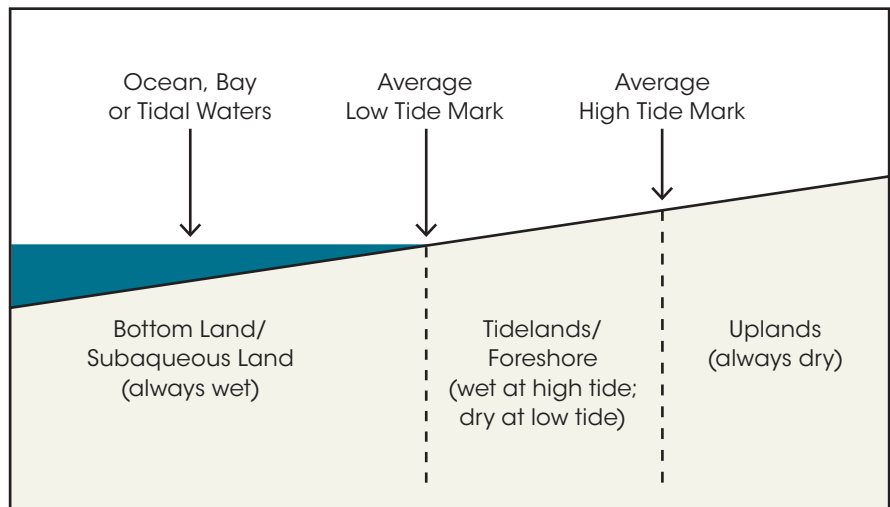
The water's edge provides a convenient dividing line for considering the property and the players involved in the coastline property ownership issue. In areas where tides can change the water level depending on whether it is high or low tide (the type of area affected by rising sea levels), the property that is always underwater even at low tide is sometimes called the *bottom land* (or, in Delaware, "subaqueous lands"<sup>4</sup>), and the owner of such always-submerged land is the *bottom owner*.<sup>5</sup> The property that is always dry even at mean high tide is often called *uplands or fast lands*,<sup>6</sup> and the owner of such always-dry land is the *upland owner*.<sup>7</sup>

As this description suggests, there is an area between the bottom land and the upland which can be submerged or dry depending on the tides (often called "tidelands" or the "foreshore") defined by the *mean low tide mark* (the place on the shore where, on average, the edge of the water is at low tide) and the *mean high tide mark* (the place on the shore where, on average, the tide reaches its highest point).<sup>8</sup>

In Delaware, the foreshore is owned by the upland owner.<sup>9</sup> Thus, starting in the water and heading up onto the dry land at the shore, there are three different properties – the bottom (or subaqueous) land, the tidelands/foreshore and the upland (see chart above).

With these three distinct properties can be up to three distinct property owners – the bottom (or subaqueous land) owner, the tidelands owner and the upland owner.

Because coastlines are dynamic, land can be added or lost. Land can be added by gradual, imperceptible deposit of soil onto the upland so that the dry land increases in area (called *accretion*<sup>10</sup>), or by the gradual, imperceptible exposure of



bottom land when the water level drops so that the formerly submerged land becomes permanent dry land (called *reliction*<sup>11</sup>).

The dry land on the shore or coast can be lost by the gradual, imperceptible removal of soil from the upland through wave action so that the dry land decreases in area (called *erosion*<sup>12</sup>), or by the gradual, imperceptible covering up of previously dry upland as the water level rises (called *submergence*).

Note that in all these cases the change needs to be gradual and imperceptible; if the change occurs suddenly – as, say, the result of a violent storm – the sudden change is called an *avulsion*.

The general rule is that land created by accretion or reliction becomes the land of the upland owner,<sup>13</sup> while land lost through erosion or submergence becomes the land of the bottom owner.<sup>14</sup> The justification for the accretion/reliction rule is that it ensures the upland owner the continued benefit of her riparian rights in access to and use of the water.<sup>15</sup> The usual justification for the rule concerning erosion and submergence is that, if the upland owner gets the benefit of newly created land via accretion or reliction, then the upland owner must bear the burden when her land disappears through erosion or submergence.<sup>16</sup>

In effect, a kind of mutuality or symmetry of benefits and burdens underlies the rules. The rules of ownership make

sense as long as there is a chance that, at any given time, natural forces can cause either land creation or destruction, for the risk of possible property loss is balanced by the reward of possible property gain.

However, the impact of the rules are stark. Then-Vice Chancellor Jacobs summarized these rules under Delaware law in this way:

The rule that a land boundary may shift with the shoreline normally applies to land that is riparian to an adjoining body of water. In such cases, the doctrine of accretion will cause the boundary between the riparian upland and the body of water (*e.g.*, a lake bottom) to shift with the shoreline. As the water level drops or as soil is deposited imperceptibly against the bank, the shoreline extends and the resulting accretions belong to the riparian owner. Conversely, as the lake level rises or the bank wears away, the former upland, now flooded, is lost to the riparian owner. Thus, the effect of the accretion doctrine is to keep riparian property riparian.

In short, where a riparian parcel becomes completely covered by water, title to that parcel is lost, and the formerly adjacent parcel becomes riparian. If the riparian parcel consists of a fifty-foot wide strip of land adjoining a lake, and that riparian parcel later becomes covered with water,



the owner loses title to that property, at least (in the view of some jurisdictions) until that property reemerges by the reverse process of accretion.<sup>17</sup>

In a world where seas are only rising, however, this benefit-burden symmetry gets lost. Oceanfront property owners face the prospect of losing valuable upland, and no realistic chance of gaining such land through accretion and reliction. This then creates a strong economic incentive to protect the property from being lost to the sea – through “hardening” the coastline via seawalls or other mechanisms that will keep the Bay at bay.

The problem, of course, is that it is probably impossible and certainly undesirable to harden the entire Delaware coastline. In some (perhaps many) places, upland owners simply cannot afford the cost of hardening their properties. In other places (for example, along public beaches, state parks or in resort areas), the idea of a tall wall to “keep the sea out” would likely be viewed as inconsistent with the recreational, aesthetic and economic interests at work in those areas.

As a result, some upland owners will harden, but other will not. The resulting “patchwork” of hardening means that unhardened lands will likely suffer greater inundation (after all, the amount of sea water is still the same and must go somewhere),<sup>18</sup> and will make it difficult for coastal communities to plan to adapt to sea level rise.

### Waves Forming: The Coming Legal Issues

While a no action, *laissez faire* approach to sea level rise is possible, it is likely that local and state governments will want to manage how Delaware adapts to rising seas and the consequences of significant portions of land being inundated. Therefore, it is important to begin analyzing the legal tools that might be used in such a program.<sup>19</sup>

At the local level, tools such as zoning (via setbacks, overlays and down-zoning) and building codes would be

the primary means by which a local community could attempt to manage adaptation to sea level rise. Such local tools would give rise to legal claims arising out of possible regulatory takings, although transferable development credits (which are recognized in Delaware law<sup>20</sup>) might be an innovative way to compensate property owners and thereby avoid a takings claim. Separately, local governments would have to deal with the issue of how to handle pre-existing structures or activities that would become non-conforming uses.

At the state level, building restrictions (based perhaps on some variation of the concepts of controlling uses like that found in the Coastal Zone Act<sup>21</sup> or controlling locations of building like that found in the Beach Preservation Act<sup>22</sup>) and buffer zones or setbacks might be regulatory ways to manage adaptation to sea level rise. Restrictions would raise takings and nonconforming use issues, while setbacks at a state level might require enabling legislation in light of the zoning nature of such a regulation recognized in *Sussex County v. DNREC*.<sup>23</sup>

One intriguing idea would be for the state to engage in acquisitions of interests (likely in the form of easements) in coastal properties that might regulate the use of such property so as to accomplish adaptation goals. Such easements could be set up so that they move with the coastline as sea levels rise – what is sometimes known as a “rolling easement.”<sup>24</sup>

In this regard, it is important to note that, while the Delaware Land Protection Act<sup>25</sup> allows the state to purchase “any interest” in land in order to conserve existing or planned natural or cultural resources,<sup>26</sup> the DLPA is restricted to *voluntary* sales by the property owner, as the statute specifically prohibits the use of eminent domain to acquire land for public recreation or the conservation of natural resources.<sup>27</sup>

The Delaware Planning Act,<sup>28</sup> which legislates the ability of public entities to use eminent domain for a “limited, de-

fined public use,”<sup>29</sup> specifically prohibits the use of eminent domain to acquire land if the “primary purpose” is to conserve Delaware’s natural resources.<sup>30</sup>

The negotiation of voluntary agreements and litigation over the state’s ability to carry out a regulatory program are likely to generate a significant amount of legal work as the state’s strategy is developed and implemented. Whether it amounts to a tidal wave of legal work might well depend upon the extent of the programs being implemented and the clarity by which those programs and the enabling legislation define the playing field.

### Conclusion

With rising seas come new legal issues and challenges for local and state governments and for coastal property owners in Delaware. The waves of water will bring waves of legal issues, the number and complexity of which will only emerge over time. The ability to foresee the possible legal issues that are coming will help prepare more intelligent responses to sea level rise and identify the ways in which the battle between private property interests and the public’s desire to manage the consequences of rising sea will ultimately play out. ♦

*Kenneth T. Kristl is an Associate Professor of Law and Director of Environmental and Natural Resources Law Clinic at the Widener University School of Law, Wilmington, DE.*

### FOOTNOTES

1. Available at <http://www.dnrec.delaware.gov/coastal/Pages/SLR/DelawareSLRVulnerabilityAssessment.aspx> (last checked September 30, 2013).
2. *Vulnerability Assessment*, p. 19. In particular, the *Vulnerability Assessment* breaks this down as 9 – 12% of New Castle County, 6 – 12% in Kent County, and 6 – 9% in Sussex County. *Id.*
3. The *Vulnerability Assessment* identifies the following assets as being inundated: 33 – 78% of the state’s dikes, dams, and levees; 33 – 76% of the Port of Wilmington; 16 – 25% of heavy industrial lands in the coastal area (as permitted by Delaware’s Coastal Zone Act); 2 – 6%

of the state's railroad lines; and 1 – 5% of the state's roads and bridges. *Id.* at pp. x – xii. In addition, 3 – 7% of land designated as future development areas by Delaware's Strategies for State Policies and Spending that would meet future demand for residential and commercial development would be inundated. *Id.*

4. See 7 Del. C. § 7201 *et seq.* (The Subaqueous Lands Act). The Act defines “subaqueous lands” as “submerged lands and tideland,” § 7202(c), and defines “submerged lands” as:

(1) Lands lying below the line of mean low tide in the beds of all tidal waters within the boundaries of the State;

(2) Lands lying below the plane of the ordinary high water mark of nontidal rivers, streams, lakes, ponds, bays and inlets within the boundaries of the State as established by law; and

(3) Specific manmade lakes or ponds as designated by the Secretary.

§ 7202(d).

5. See S. Glasscock III, Effects of Accretion and Erosion on Coastal Property in the United States, 8 Int'l J. Marine & Coastal Law 135, 136 (1993).

6. See S. Glasscock III, *Effects of Accretion and Erosion on Coastal Property in the United States*, 8 Int'l J. Marine & Coastal Law 135, 136 (1993).

7. *Id.*

8. See J. Titus, *Rising Seas, Coastal Erosion and the Takings Clause: How to Save Wetlands and Beaches Without Hurting Property Owners*, 57 MD. L. Rev. 1279, 1291-92 (1998) (hereinafter “Titus-Rising Seas”). This can include mudflats, low marsh, and wet beaches. *Id.*

9. See *City of Wilmington v. Parcel of Land*, 607 A.2d 1163, 1168 (Del. 1992); *State ex rel. Buckson v. Pennsylvania R. Co.*, 267 A.2d 455, 457-58 (Del. 1969) (“in Delaware a riparian owner of land fronting on navigable water holds title to the low water mark and, therefore, owns the foreshore”); *Martin v. Turner*, 2009 WL 4576228 at \*2 (Del. Ch. November 23, 2009) (“In most states, the region between the high and low-tide lines (the “foreshore”) of such waters is in public ownership. Delaware, however, follows a different rule: in Delaware the foreshore is capable of private ownership, subject to a public navigational trust over the area when it is covered by the tide”); *Harlan & Hollinsworth Co. v. Paschall*, 5 Del. Ch. 435, 453 (1882); *State v. Reybold*, 5 Harr. 484 (Del. Ct. Gen. Sess. 1854). In *Bickel v. Polk*, 5 Har. 325 (Del. Sup. Ct. 1851), the court ruled that, though the riparian owner owned the soil to the low water mark, it would not be a trespass on his land to catch fish in waters which had submerged the foreshore because of the “com-

mon right” to fish in public streams affected by the tide.

10. See *Id.*; P. Lear, *Accretion, Reliction, Erosion and Avulsion: A Survey of Riparian and Littoral Title Problems*, 11 J. Energy Natl. Res. & Envtl. Law 265, 275 (1990) (“‘Accretion’ is defined as the process whereby the action of water causes the gradual and imperceptible deposit of soil so that the soil becomes fast, dry land. Stated differently, ‘accretion’ is the increase in land area bounded by water, caused by the gradual deposit of soil by the water body.” See also *Smith v. United States*, 593 F.2d 982, 984 (10th Cir. 1979).

11. See BLACK’S LAW DICTIONARY (9th ed. 2009).

12. See BLACK’S LAW DICTIONARY (9th ed. 2009); LEAR, *supra* note 12, at 278.

13. See Lear, *supra* note 11, at 275-76; *Hughes v. Washington*, 389 U.S. 290, 293 (1967); *Jef-feris v. East Omaha Land Co.*, 134 U.S. 178, 189-90 (1890).

14. See Lear, *supra* note 11, at 278; Glasscock, *supra* note 7, at 136. Note that, in the case of an avulsion, ownership does not change. See Glasscock, *supra* note 7, at 136; *County of St. Claire v. Livingston*, 23 Wall. 43 (1874).

15. See R. Abrams, *Walking The Beach To The Core Of Sovereignty: The Historic Basis For The Public Trust Doctrine Applied In Glass V. Goeckel*, 40 U. Mich. J. L. Reform 861, 899 (2007) (doctrine “marr[ies] the physical realities of natural forces operating at the edge of water bodies to the almost tautological principle that riparian parcels are, and ought to remain, parcels that touch the water”); Lear, *supra* note 11, at 276; Glasscock, *supra* note 7, at 137. In *Martin v. Turner*, 2009 WL 4576228 at \*4 (Del. Ch. November 23, 2009), then-Master Glasscock described it this way:

Unlike most real property with fixed boundaries, riparian property has a boundary formed by a waterway. Among the most important attributes of such a lot is its access to the water, and the various riparian rights which attach to that water access. If land accreted to such property did not become also the property of the lot owner – that is, if the boundary along the waterway remained fixed and the accreted land belonged, say, to the owner of the bottom – the formerly-riparian owner would be separated from the channel by this newly accreted land: he would no longer own waterfront property. Because the riparian nature of waterfront property is considered at common law such a valuable component of the owner’s rights in that property, under the doctrine of accretion, the riparian boundary follows the stream.

16. See Glasscock, *supra* note 7, at 137; Lear, *supra* note 11, at 276. These sources also suggest that an important justification for the accretion side of the rule is that it maintains the riparian owner’s access to the water (if land is added, it is hers, so that she still has access to the water. In the broader context of accretion and erosion (both of which can happen to the riparian owner), the mutuality of the benefit and burden imposed by the two rules seems to be a more complete and better justification.

17. *Scureman v. Judge*, 747 A.2d 62, 66-67 (Del. Ch. 1999) (citations omitted).

18. The Delaware Sea Level Rise Advisory Committee recognized this problem in Number 46 of its *Final Recommendations for Preparing Delaware for Sea Level Rise* approved on May 23, 2013, available at <http://www.dnrec.delaware.gov/coastal/Documents/SLR%20Advisory%20Committee/FinalRecommendations052313Cleanv2.pdf>: “Certain adaptive measures taken to mitigate the impacts of sea level rise may have unforeseen secondary and cumulative impacts to adjacent properties. For example, the hardening of a segment of shoreline with rock can result in accelerated erosion of adjacent unprotected shorelines.”

19. The Widener Environmental and Natural Resources Law Clinic has received a grant from DNREC’s Coastal Programs to analyze the legal tools that could be used to adapt to sea level rise and how Delaware law impacts the ability to use such tools. The final report of this effort will be issued in March 2014, and will discuss many of the issues mentioned here in greater detail.

20. See 22 Del. C. § 310.

21. 7 Del. C. § 7001 *et seq.* The CZA bans new heavy industry uses and regulates via permit new manufacturing uses.

22. 7 Del. C. § 6801 *et seq.* The BPA regulates building seaward of a building line designated by DNREC, while requiring “letters of approval” for building landward of the line. 7 Del. C. § 6805.

23. 34 A.3d 1097 (Del. 2011).

24. See Rolling Easements (EPA 430R11001) James G. Titus, <http://water.epa.gov/type/oceb/cre/upload/rollingeasementsprimer.pdf> (last visited Sep. 16, 2013).

25. 7 Del. C. § 7501 *et seq.*

26. 7 Del. C. § 7503(a).

27. 7 Del. C. § 7503(b) “State agencies shall not exercise the “right of eminent domain” to carry out the provisions of this chapter.”

28. 29 Del. C. § 9101 *et seq.*

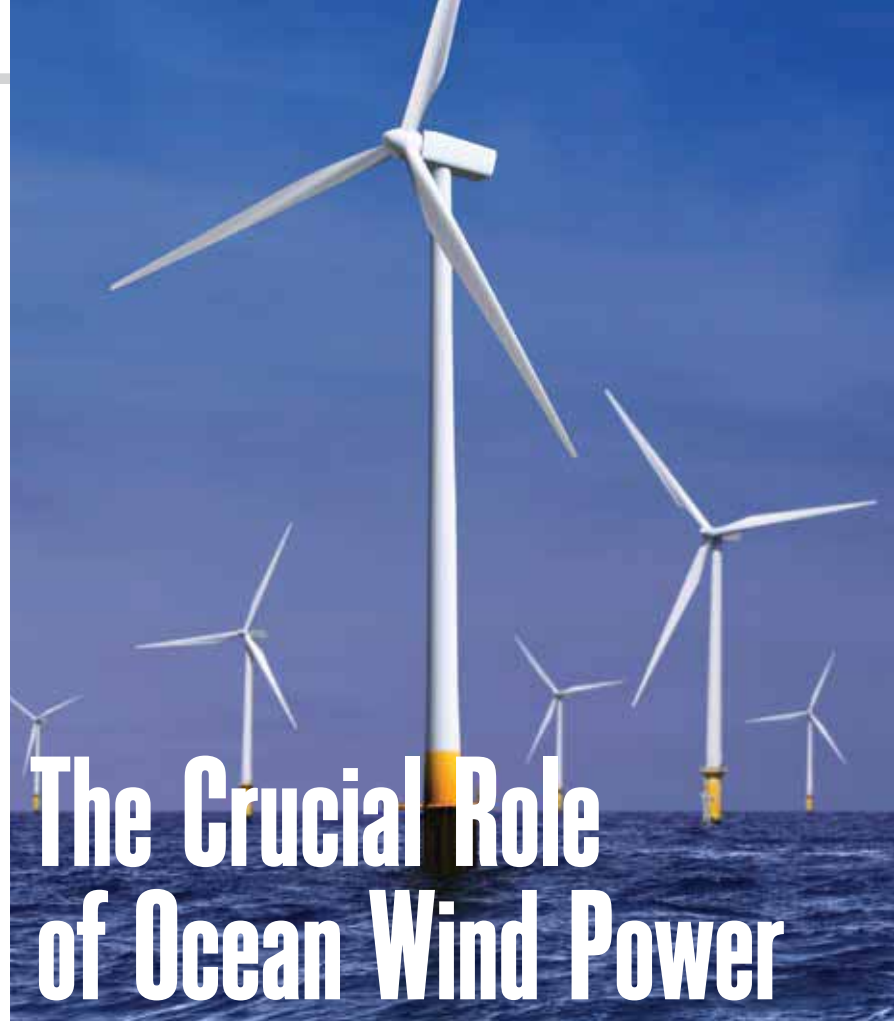
29. 29 Del. C. § 9501A(a)

30. 29 Del. C. § 9501C.

# In the Public Trust:

States and the federal government should move quickly to embrace Ocean Renewable Energy under the Public Trust Doctrine.

## The Crucial Role of Ocean Wind Power



Sergiy Serdyuk

Delaware, with 381 miles of tidal shoreline and, at 60 feet, the lowest mean elevation in the nation, is quite vulnerable to rising sea levels, as well as warming and acidifying seas. Indeed, Delaware is near the center of a North Atlantic coast “hot spot” running from Cape Hatteras to Boston where sea levels have been rising three to four times faster than the global average since 1980.<sup>1</sup>

Yet like most waterfront states whose ecosystems are increasingly harmed by our 21st-century climate change impacts, Delaware has not yet developed significant sources of Ocean Renewable Energy (ORE), nor developed a full-bodied Public Trust Doctrine (PTD) – although, for that matter, neither has the U.S. government.

Given our still-growing reliance on fossil-fueled energy production, and the ability of ORE to better protect both our ecosystems and economy long-term, this article recommends that one key underutilized tool for prioritizing clean energy development is the PTD –

and will explain how Delaware lawyers can strive to use it.

Specifically, ORE is a means of commercially using public trust resources for the public’s benefit while also directly mitigating the detrimental impacts of climate change on public trust resources such as coastal and freshwater ecosystems, fisheries and wildlife.

Not only is the planet undergoing one of the largest climate changes in the past 65 million years, Stanford scientists report that it’s on pace to occur at a rate 10 times faster than any change in that period.<sup>2</sup> If we do not significantly reduce carbon use and emissions, then, on average, total warming from preindustrial



levels by 2100 is headed toward 4°C.<sup>3</sup>

In 2012 the planet witnessed average global land and sea surface temperatures that ranked among the 10 warmest years on record, with the heat content in the upper 700 meters of the ocean at record highs and sea levels reaching record levels as well.<sup>4</sup> These increased temperatures have continued, with NOAA ranking the month of June 2013 among the five warmest on record globally.<sup>5</sup>

Rising temperatures are linked to rising sea levels: a recent study found global sea levels likely will rise about 7.5 feet for every 1°C global average temperature increase.<sup>6</sup>

The September 2013 Intergovernmental Panel on Climate Change (IPCC) report finds that ocean warming accounts for more than 90% of the energy accumulated between 1971 and 2010. The Greenland and Antarctic ice sheets have been losing mass, glaciers have continued to shrink almost worldwide, and Arctic sea ice and Northern Hemisphere spring snow cover have continued to decrease in extent – and all these changes will continue through this century.

Under all scenarios the rate of sea level rise will very likely exceed that observed during 1971–2010 due to increased ocean warming and increased loss of mass from glaciers and ice sheets.<sup>7</sup>

The new report projects that global mean sea level rise for 2081–2100 will likely be in the range of 10.2 to 32 inches, depending on greenhouse gas emissions; the scenario of no-slowdown of fossil fuel emissions shows a mean sea level rise range between 21 and 38.2 inches, which would be devastating – with substantial damages in the hundreds of billions of dollars – for numerous highly populated coastal cities at or near current sea levels, from New York to Hong Kong.<sup>8</sup>

Over the past century, global sea-surface temperatures have increased approximately 1.3°F, with the heat penetrating almost two miles into the ocean.<sup>9</sup> Ocean warming is having a significant impact on marine species, caus-

ing them to change breeding times and shift their habitats towards the poles at a rate much faster than terrestrial species.<sup>10</sup> Phytoplankton (basic food for all marine species), zooplankton and bony fish are moving towards the poles at an average of 45 miles every decade, greatly outpacing the terrestrial species average of 4 miles; changes like these generally lead to “migration, adaptation or extinction,” with the potential to drastically affect fishing and marine tourism industries.<sup>11</sup>

Warming ocean waters have also facilitated the outbreak of pathogens in eastern oysters and microbial diseases in reef-building corals,<sup>12</sup> while ocean warming and acidification<sup>13</sup> have led to declines in clam populations off the Maine coast.<sup>14</sup> The oceans are acidifying 10 times faster today than 55 million years ago when a mass extinction of marine species occurred. We are risking a “marine biological meltdown by end of century.”<sup>15</sup>

Sea level rise, ocean warming, ocean acidification and acute damage from severe weather events as a result of climate change increasingly have the potential to drastically alter the ecosystems of wetlands, estuaries, near-shore and deep-sea fisheries to the point that will make any form of the PTD obsolete.

The United States PTD is premised on the notion that while the majority of resources are held in private ownership, some property, such as navigable and tidal waters and the lands beneath, is held in trust by the state for the benefit of the public.<sup>16</sup> In recent years, many coastal states have extended the PTD to the three nautical mile (nm) limit of their territorial waters;<sup>17</sup> however, Delaware is not one of them.<sup>18</sup>

In 1971 the California Supreme Court first incorporated ecological preservation into the PTD in *Marks v. Whitney*.<sup>19</sup> Adoption of the value of preservation for current and future generations is not unique to California, with similar holdings in other states. Additionally, the PTD has been extended to other public trust values. For example, in

2008 the California Court of Appeals in *Ctr. for Biological Diversity, Inc. v. FPL Group, Inc.*<sup>20</sup> held that the public trust includes the protection and preservation of wildlife, including wild birds in addition to fish.<sup>21</sup>

But in striking contrast to the relatively long-standing and well-established legal principle that the PTD is applicable to state waters and resources, there is no such foundation for the PTD’s viability in the federal Constitution, statutes or common law. Good public trust language is found in some federal resource management statutes, such as the National Environmental Policy Act<sup>22</sup> and Coastal Zone Management Act,<sup>23</sup> but most commentators conclude that no federal PTD presently exists.<sup>24</sup>

This omission is especially critical concerning federal sea waters that lie more than three nautical miles from shore;<sup>25</sup> indeed, the Exclusive Economic Zone (EEZ) (12nm to 200nm) alone covers 4.4 million square miles, an expanse larger than the combined area of all 50 U.S. states.<sup>26</sup>

Although some ORE projects have been permitted and installed<sup>27</sup> in recent years in state and federal waters, ORE – with its great potential to utilize public trust resources to generate clean energy and slow the pace of climate change – can more significantly aid both states and the federal government in living up to their trust obligations.

The ORE technology with the greatest production potential is offshore wind energy generation, which offers significant advantages over land-based wind energy generation, such as stronger and more consistent wind speeds leading to higher net capacity factors<sup>28</sup> and higher power densities.

The projects of Cape Wind in Massachusetts and Block Island in Rhode Island will be shallow-water installations built into the seabed,<sup>29</sup> with the former in federal waters and the latter in state waters. Deep-water installations utilize floating platforms tethered by anchors or moorings instead of embed-

ding monopole foundations.

This nascent floating platform turbine technology, with pilot projects in Norway, Portugal, Japan and in the Gulf of Maine,<sup>30</sup> seeks to capitalize on the greater wind speeds and energy potential found in the deep waters further from shore, but also provide energy to consumers in proximate major coastal cities.<sup>31</sup>

Any negative impacts ORE may have on public trust resources pale in comparison to the current and impending detrimental impacts of climate change on public trust resources. The National Wildlife Federation, calling for rapid deployment of clean, renewable energy sources such as ORE as a means to reduce carbon emissions, highlighted the potential offshore wind has in offsetting carbon pollution and protecting ocean biodiversity from the risk of ocean acidification, rising water temperatures and sea level rise caused by climate change.<sup>32</sup>

Thus, establishing ORE as a public trust value would enable the PTD to act as a means to help preserve resources subject to public ownership. ORE's ability to mitigate carbon emissions complements other modern trust values, because stemming climate change impacts helps preserve coastal, tideland and wetland ecosystems along with wildlife dependent on those ecosystems for both current and future generations.

Using the PTD to support ORE also directly promotes the traditional trust value of commerce, as a burgeoning ORE industry could generate billions of dollars in economic activity through utilization of trust resources. Offshore wind, tidal and wave energy could spur the growth of an entire economic sector, given the engineering and fabrication of complex materials, and installation and supporting infrastructure using specialized labor, equipment and sea vessels.

Also, ORE projects can be sited to minimize interference with fishing and navigation through ecosystem-based, sea-use planning policies, such as marine spatial planning.<sup>33</sup>

As ORE aligns with the core principles behind traditional and modern PTDs, it is now up to legislatures and courts to put ORE on an equal footing with other trust values.

A federal PTD could be derived from the Commerce Clause,<sup>34</sup> with congressional preemption as a means to regulate vital waterways for navigation and commerce.<sup>35</sup> The doctrine's influence is also found in the Property Clause,<sup>36</sup> in that the sovereignty and sovereign rights the U.S. holds over the territorial sea and EEZ, respectively, allow Congress to regulate federal waters under the Property Clause.<sup>37</sup>

As is the case with state public trust doctrines, a federal PTD also could be developed through federal common law. The circumstances under which the federal common law can be invoked are limited by *Texas Industries, Inc. v. Radcliff Materials, Inc.*,<sup>38</sup> holding that any court wishing to invoke federal common law must show that state law is unable to resolve the issue because "the authority and duties of the United States as sovereign are intimately involved or because the interstate or international nature of the controversy makes it inappropriate for state law to control."<sup>39</sup>

But those circumstances exist under current regulations influencing federal oceans: (1) unique federal interests are involved, as states cannot assert authority in federal waters; and (2) the interstate and international nature of the EEZ makes state law ineffective and requires U.S. action.<sup>40</sup>

Consequently, *Texas Instruments* supports elevating ORE to equal footing with other public trust values as a means to mitigate climate change.

In the 2000 decision of *In re Water Use Applications*<sup>41</sup> the Hawaii Supreme Court averred that "[t]he public trust, by its very nature, does not remain fixed for all time, but must conform to changing needs and circumstances."<sup>42</sup> Given the common law's ability to evolve to meet the needs of an ever-changing society,<sup>43</sup> the PTD can act as an effective means to manage and protect trust resources

beyond the traditional scope of fishing, commerce and navigation.<sup>44</sup> The incorporation of ORE as a trust value would further these preservation values, as a means to mitigate the negative impacts of climate change on all trust resources while aligning with the traditional trust value of commerce.

Some states have already begun to prioritize ORE through legislative efforts. Maine passed legislation to facilitate the development of ORE in state waters,<sup>45</sup> designating "Ocean Energy Testing Areas" and establishing a special general permit program to expedite regulatory review of demonstration ORE projects.<sup>46</sup> This has led to Maine's hosting the first electricity-generating tidal and ocean wind power projects in the U.S.

Be it by legislation or litigation, it is past time for the rest of the nation, including Congress and federal courts, to embrace the PTD and ORE as key tools in the effort to slow the economic and environment damages confronting us, our children and grandchildren. ♦

## FOOTNOTES

1. Asbury H. Sallenger, Jr., *Hotspot of Accelerated Sea-Level Rise on the Atlantic Coast of North America*, 2 NATURE CLIMATE CHANGE 884, 884 (2012).
2. Bjorn Carey, *Climate change on pace to occur 10 times faster than any change recorded in past 65 million years, Stanford scientists say*, Aug. 1, 2013, <http://news.stanford.edu/news/2013/august/climate-change-speed-080113.html>
3. Romm, *Alarming IPCC Prognosis: 9°F Warming For U.S., Faster Sea Rise, More Extreme Weather, Permafrost Collapse*, Sept. 27, 2013, <http://thinkprogress.org/climate/2013/09/27/2691471/ipcc-report-warming-extreme-weather/>
4. Blunden, J., & D. S. Arndt, Eds., *State of the Climate in 2012*. 94 (8), BULL. AMER. METEOR. SOC., S1-S238, Sxiv (2013).
5. Jason Samenow, *Snow and Arctic sea ice plummet suddenly as globe bakes*, THE WASHINGTON POST, Jul. 18, 2013, <http://www.washingtonpost.com/blogs/capital-weather-gang/wp/2013/07/18/snow-and-arctic-ice-extent-plummet-suddenly-as-globe-bakes/>
6. *Each Degree of Warming Will Raise Sea Levels 7.5 Feet*, ENVIRONMENTAL NEWS SER-

- VICE, July 15, 2013, <http://ens-newswire.com/2013/07/15/each-degree-of-warming-will-raise-sea-levels-7-5-feet/>
7. IPCC Headline Statements from the Summary for Policymakers, [http://www.climatechange2013.org/images/uploads/WG1AR5\\_Headlines.pdf](http://www.climatechange2013.org/images/uploads/WG1AR5_Headlines.pdf)
8. Andrew Freedman, *Zeroing In on IPCC's Sea Level Rise & Warming 'Hiatus'*, Sept. 27, 2013, <http://www.climatecentral.org/news/zeroing-in-on-ipccs-sea-level-rise-warming-hiatus-16532>
9. Jeffrey Thaler, *Fiddling as the World Floods and Burns: How Climate Change Urgently Requires a Paradigm Shift in the Permitting of Renewable Energy Projects*, 42 *Env'tl. L.* 1101, 1123 (2012) citing S. Levitus et al., *Warming of the World Ocean, 1955-2003*, 32 *GEOPHYSICAL RES. LETTERS* 1 (2005).
10. *Global Scientists Shocked by True Scale of Ocean Warming*, ENVIRONMENT NEWS SERVICE, Aug. 5, 2013, <http://ens-newswire.com/2013/08/05/global-scientists-shocked-by-true-scale-of-ocean-warming/>
11. *Id.*
12. WILDLIFE IN A WARMING WORLD REPORT, NATIONAL WILDLIFE FEDERATION 5 (2013) [hereinafter NWF REPORT], <https://www.nwf.org/News-and-Magazines/Media-Center/Reports/Archive/2013/01-30-13-Wildlife-In-A-Warming-World.aspx>
13. Ocean acidification is the reduction of the pH caused primarily by the uptake of CO<sub>2</sub> from the atmosphere. Ocean pH has declined globally by about 0.1 units, making the ocean 26% more acidic and carbonate ions less abundant, which are a crucial component of the calcium carbonate needed for the formation of sea shells (oysters, clams, crabs, lobsters) and coral skeletons. *What is Ocean Acidification?*, NOAA OCEAN ACIDIFICATION PROGRAM, <http://www.oceanacidification.noaa.gov/Home/WhatIsOceanAcidification.aspx>
14. Will Graff, *'They just boil out of the water': Green crabs destroy clams; are lobsters next?*, THE FORECASTER, July 9, 2013, available at <http://www.theforecaster.net/news/print/2013/07/09/they-just-boil-out-water-green-crabs-destroy-clams/166208>
15. Joe Romm, *Ocean Acidification May Amplify Global Warming This Century Up To 0.9°F*, Aug. 26, 2013, <http://thinkprogress.org/climate/2013/08/26/2525901/ocean-acidification-amplify-global-warming/>
16. Alexandra B. Klass, *Modern Public Trust Principles: Recognizing Rights and Integrating Standards*, 82 *NOTRE DAME L. REV.* 699, 699 (2006).
17. Robin Kundis Craig, *Mobil Oil Exploration, Environmental Protection, and Contract Repudiation: It's Time to Recognize the Public Trust in the Outer Continental Shelf*, 30 *ELR* 11104, 11117 (2000) citing *Napeahi v. Wilson*, 987 F. Supp. 1288, 1291-92 (D. Hawaii 1996); *Darden v. Pebble Beach Reality, Inc.*, 860 F. Supp. 1101, 1106 (E.D.N.C. 1993); *Donnell v. United States*, 834 F. Supp. 19, 26 (D. Maine 1993).
18. Cf. Edward Fornias, *The Public Trust Doctrine in Delaware: The Problem of Beach Access*, 17 *DELAWARE LAWYER* 35-38 (1999), [http://www.delawarebarfoundation.org/delawyer/Volume17\\_Number1\\_Spring1999.pdf](http://www.delawarebarfoundation.org/delawyer/Volume17_Number1_Spring1999.pdf)
19. 491 P.2d 374 (Cal. 1971).
20. 83 Cal. Rptr. 2d 588 (Cal. Ct. App. 2008).
21. *Id.* at 595-96.
22. NEPA contains language directing federal agencies to "fulfill the social, economic, and other requirements of present and future generations of Americans," 42 U.S.C.A. § 4331(a), as well as declaring it the obligation of the Federal Government to "fulfill the responsibilities of each generation as trustee of the environment for succeeding generations...." *Id.* § 4331(b)(1).
23. CZMA plans must "preserve, protect, develop, and where possible... restore or enhance the resources of the Nation's coastal zone for this and succeeding generations," 16 U.S.C.A. § 1452(1); moreover, the CZMA also finds that "[b]ecause global warming may result in a substantial sea level rise with serious adverse effects in the coastal zone, coastal states must anticipate and plan for such an occurrence." *Id.* § 1451(l).
24. See Eric Pearson, *The Public Trust Doctrine in Federal Law*, 24 *J. LAND RESOURCES & ENVTL. L.* 173, 174-74 (2004) ("The public trust doctrine...exists only nominally in federal law....Much of the soaring pro-federal public trust doctrine rhetoric, therefore, would seem to be empty, or near-empty, talk.")
25. Submerged Lands Act of 1953, 43 U.S.C.A. § 1301(b) (2013).
26. Mary Turnipseed, et al., *The Silver Anniversary of the United States' Exclusive Economic Zone: Twenty-Five Years of Ocean Use and Abuse, and the Possibility of a Blue Water Public Trust Doctrine*, 36 *Ecology L.Q.* 1, 3 (2009).
27. See *Cape Wind Lease-Bureau of Ocean Energy Management*, <http://www.boem.gov/Renewable-Energy-Program/Studies/Cape-Wind.aspx>; *Ocean Renewable Power Company (ORPC)*, <http://www.orpc.co/default.aspx> (tidal energy project located off the Maine coast); Mario Moretto, *UMaine's floating prototype becomes first offshore wind turbine to provide power to US*, BANGOR DAILY NEWS, Jun. 13, 2013, <http://bangordailynews.com/2013/06/13/news/hancock/umaine-floating-prototype-becomes-first-offshore-wind-turbine-to-provide-power-to-us/?ref=relatedSidebar>
28. Thaler, *supra* note 9, at 1128-30 (net capacity factor: ratio of actual power output over time divided by its potential output if it had operated at full nameplate capacity the entire time).
29. *Id.* at 1129.
30. Main(e) International Consulting LLC, *Floating Offshore Wind Foundations: Industry Consortia and Projects in the United States, Europe and Japan*, 11, 21, 22, 42 (2013). Deployed June 2013, the Maine project is the first offshore wind turbine in the Americas to provide electricity to the power grid; it also is the first concrete-composite floating wind turbine in the world, using advanced material systems with a unique floating hull and tower design.
31. Thaler, *supra* note 9, at 1130 (citations omitted).
32. NWF REPORT, *supra* note 12, at 3, 38-40.
33. Fanny Douvère, *The Importance of Marine Spatial Planning in Advancing Ecosystem-Based Sea Use Management*, 32 *MARINE POLICY*, 762 (2008).
34. See U.S. CONST. art. I, § 8, cl. 3.
35. Charles F. Wilkinson, *The Headwaters of the Public Trust: Some Thoughts on the Source and Scope of the Traditional Doctrine*, 19 *Env'tl. L.* 425, 455-59 (1989).
36. See U.S. CONST. art. IV, § 3, cl. 2.
37. Administration of Coral Reef Resources in the Northwest Hawaiian Islands 2000 O.C.C. LEXIS 30, 39-40 (2000).
38. 451 U.S. 630, 640 (1981).
39. *Id.* at 641.
40. Turnipseed, *supra* note 26, at 48.
41. 9 P.3d 409 (Haw. 2000), *aff'd in part and vacated in part by In Re Water use Permit Applications*, 105 Haw. 1 (2004).
42. *Id.* at 447.
43. Wilkinson, *supra* note 35, at 468-69, quoting Jerome Frank, *LAW AND THE MODERN MIND* 6-7 (1930) ("Our society would be straitjacketed were not the courts, with the able assistance of lawyers, constantly overhauling the law and adapting it to the realities of ever-changing social, industrial and political conditions....").
44. Turnipseed, *supra* note 26, at 19, 47.
45. Pub. Law. 270 LD 1465 "An Act to Facilitate Testing and Demonstration or Renewable Ocean Energy Technology."
46. 38 M.R.S.A. § 480-HH.



# Delaware Joins the Green War on Wildlife

Wind turbines deface the land and threaten wildlife, while offering dubious benefits.

People who value open space and wildlife in Delaware are fortunate that the State's wild places thus far have escaped development by the wind power industry. Delaware electric ratepayers nonetheless are subsidizing new wind turbine construction and operation in nearby states, thanks to successful lobbying in Delaware by industry and environmentalist advocates for "renewable" power.

In Delaware as elsewhere, a growing presumption that "fossil fuels bad, renewable energy good" has turned into a type of groupthink that has closed minds, shifted conservation groups away from their traditional core values and resulted in bad State policy. In the name of preserving the environment, we have been putting our natural areas and wildlife at alarming risk with no real debate on the wisdom of what we are doing.

Delaware's "Renewable Energy Portfolio Standards Act,"<sup>1</sup> enacted in 2005, requires electric companies to purchase

increasing amounts of power from "renewable" sources, mainly solar and wind. To comply with the statute, Delaware electric companies have contracted for wind power capacity to be constructed and operated in neighboring states.

Delmarva Power and the Old Dominion Electric Cooperative (parent of the Delaware Electric Co-op) take equal halves of the output of the 100 MW Armenia Mountain facility in Tioga and Bradford Counties in Pennsylvania. Delmarva Power takes a further 38 MW from the newly built Chestnut Flats facility in Blair County, Pennsylvania,



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and 40 MW from the new Roth Rock wind development in Garrett County, Maryland. The Delaware Municipal Electric Corporation will buy the power produced by a 69 MW Duke Power installation at Laurel Hill, Lycoming County, Pennsylvania.

The renewable energy “standards” enacted by the State of Delaware (and, disappointingly, endorsed by such groups as the Sierra Club and the Delaware Nature Society) have thus led to the installation of large wind turbines that deface highland countryside not unlike Brandywine Creek State Park and the Delaware Nature Society’s locations at Ashland Nature Center, Coverdale Farm and the Burrows Run, Flint Woods and Bucktoe Creek preserves.

A British writer compared the environmental impacts of the natural gas and wind power industries in Pennsylvania and elsewhere as follows:

Which would you rather have in the view from your house? A thing about the size of a domestic garage, or eight towers twice the height of Nelson’s column with blades noisily thrumming the air. The energy they can produce over ten years is similar: eight wind turbines of 2.5-megawatts (working at roughly 25% capacity) roughly equal the output of an average Pennsylvania shale gas well (converted to electricity at 50% efficiency) in its first ten years.

Difficult choice? Let’s make it easier. The gas well can be hidden in a hollow, behind a hedge. The eight wind turbines must be on top of hills, because that is where the wind blows, visible for up to 40 miles. And they require the construction of new pylons marching to the towns; the gas well is connected by an underground pipe.

Unpersuaded? Wind turbines slice thousands of birds of prey in half every year, including white-tailed eagles in Norway, golden eagles in California, wedge-tailed eagles in Tasmania. There’s a video on Youtube of one winging a grif-



fon vulture in Crete. According to a study in Pennsylvania, a wind farm with eight turbines would kill about 200 bats a year. The pressure wave from the passing blade just implodes the little creatures’ lungs. You and I can go to jail for harming bats or eagles; wind companies are immune.<sup>2</sup>

Six years ago, a team of researchers predicted that wind power development in the Mid-Atlantic Highlands (Maryland, Pennsylvania, Virginia and West Virginia) might inflict substantial harm on both local and migratory populations of tree-roosting bats (hoary bats, eastern red bats and silver-haired bats).<sup>3</sup> This prediction has been more than borne out by experience.

The Pennsylvania Game Commission estimates that 420 wind turbines operating there in 2010 killed more than 10,000 bats that year.<sup>4</sup> Some of the deaths are caused by direct impact of turbine blades on bats but most are caused by barotrauma: “The bats are basically getting close to these spinning turbines and then the pressure difference causes their capillaries in their lungs to explode.”<sup>5</sup>

A United States Geological Survey research biologist has described the “unprecedented bat mortality caused by wind turbines” and “the potentially disastrous effects on certain bat populations” – notably hoary, eastern red and silver-haired bats.<sup>6</sup> The threat is confirmed by a study underway in Delaware.<sup>7</sup> From March 2011 through February 2012 researchers found 31 dead bats (mostly eastern red, hoary and big brown bats) that had been killed by a single wind turbine in Lewes. Other carcasses likely were hidden by vegetation or taken by scavengers.<sup>8</sup>

The onslaught will get worse – much, much worse. In comparison to the 420 Pennsylvania turbines that killed more

than 10,000 bats in 2010, the Nature Conservancy predicts that as many as 2,900 turbines will be operating in the state by 2030.<sup>9</sup> Delaware’s own contribution to the carnage could increase by an order of magnitude: the Renewable Energy Portfolio Standards Act calls for the market share of “renewable” electric power to increase from 5% in 2010 to fully 25% in 2025.<sup>10</sup>

Bats are not the only wildlife at risk from wind power development. The one wind turbine in Lewes killed at least two ospreys in 2011,<sup>11</sup> suggesting that osprey populations breeding in or migrating through Delaware would be in serious trouble if more turbines were constructed along the coast. A recent study by USFWS biologists reports that a minimum of 67 bald and golden eagles (mostly golden) were killed by wind energy installations in 10 states from 2008-2012.<sup>12</sup>

This study did not include data from Altamont Pass, California. The wind “farm” there has been killing at least 2,000 eagles, hawks and other raptors *per year*, including on average 67 golden eagles *per year*, for three decades (the toll “could be higher because bird carcasses are quickly removed by scavengers”).<sup>13</sup> The eagles are being killed at a rate that cannot be sustained by the local breeding population<sup>14</sup> so the wind installation is eliminating eagles from an even wider area.

Wind power development likewise threatens the scarce eastern population of golden eagles, most of which migrate along the Appalachian ridges in Pennsylvania, Maryland, Virginia and West Virginia and are directly at risk from wind turbines to be constructed there. On a windy day in November, visitors to the Hawk Mountain Sanctuary near Kempton, Pennsylvania, may see many red-tailed hawks and a few golden





eagles gliding along the ridge and past the North Lookout. From there wind turbines are visible atop another ridge to the west. Raptors migrate along that ridge too, at least for now.

“The American Wind Energy Ass’n, an industry lobbying group, points out that far more birds are killed each year by collisions with radio towers, tall buildings, airplanes, vehicles, and in encounters with hungry household cats.”<sup>15</sup> Surprisingly, the Sierra Club and Delaware Audubon have repeated the wind industry’s refrain that cats and communications towers kill birds, too.<sup>16</sup>

Perhaps by design, this excuse ignores the fact that wind power is uniquely deadly to raptors (hawks, ospreys and eagles) and to bats, *none of which* are threatened by communications towers, buildings, cars or cats. Compared to most birds, raptors and bats reproduce slowly, so the mortality inflicted by wind turbines can threaten whole populations.

It is obviously in the wind power industry’s interest to divert attention from the damage it already is causing, with only a fraction of the installed capacity to which it aspires to grow. Less comprehensible, though, is the strange collaboration of the Sierra Club and Delaware Audubon, long after the ongoing raptor bloodbath at Altamont Pass had become notorious. These groups seem to have evolved away from their founding purposes – protection of birds in the case of the Audubon Society and preservation of unspoiled mountains in the case of the Sierra Club.

What nature has lost in protection from environmental groups, the wind power industry has gained in political cover. In a recent letter to the *Wall Street Journal*,<sup>17</sup> the American Wind Energy Association responded to criticism of the industry’s mounting death

toll on eagles by dropping the names of environmental organizations: “Groups like the National Wildlife Federation and the Audubon Society, which make it their job to protect birds, including eagles, and other wildlife, support the development of responsibly sited wind turbines.”

The upshot of this collaboration of environmental groups with the wind power industry is that more wind turbines are being built all the time, and more eagles, other raptors and bats are being killed.

The Delaware Nature Society, state affiliate of the National Wildlife Federation, continues to serve nature and people by educating children and the wider public about natural areas and wildlife, and by preserving and managing wild lands of its own. Unfortunately, its advocacy on energy issues achieves a contrary result.

On March 28, 2012, representatives of DNS and the Sierra Club joined solar industry lobbyists at a House Energy Committee meeting to successfully oppose repeal of the renewable portfolio standards. DNS submitted a written statement that quoted the statute’s recitation<sup>18</sup> of supposed benefits of renewable energy, including “improved regional and local air quality, improved public health, increased electric supply diversity, increased protection against price volatility and supply disruption, improved transmission and distribution performance, and new economic development opportunities.”

The Delaware Nature Society statement cited no benefit of renewable energy for natural areas or wildlife and did not say what, if anything, DNS thought about the unsustainable raptor and bat mortality from wind power operations in neighboring states and beyond.

Environmental groups seemingly ig-

nore the destruction of wildlife and promote “renewable energy” as a way to mitigate “climate change” and “sea level rise.” Last September, 14 organizations (including the Delaware Nature Society, the Sierra Club and Delaware Audubon) sponsored a “Delaware Sea Level Awareness Week.” A brochure for the event suggested “actions you can take to minimize some of the consequences of sea level rise and climate change.”<sup>19</sup> First among these was to “[r]educe your carbon footprint by using carpools, public transportation, fuel efficient vehicles, Energy Star appliances, and renewable energy.”

Nagging Delawareans about carbon footprints is a *non sequitur* in a discussion about sea level, for two reasons. First, it is undisputed that almost half of Delaware’s apparent sea level rise of .13 inches per year (since 1919) is due to subsidence of the land itself, not rising water levels due to warming.<sup>20</sup> This land subsidence was not and is not caused by human use of fossil fuel.

Second, most of the net warming and associated rise in sea levels from 1850 until the present happened for natural reasons, unrelated to the energy technologies in use today. Some perspective is provided by a book published 30 years ago, before most of the current politicization of climate science. “During the post-glacial warmest times [several thousand years ago], sea level was around 3 metres (10 feet) higher than today, and temperatures in Europe in summer averaged 2 - 3° C (3.5 - 5.4° F) higher than corresponding temperatures today.”<sup>21</sup> More recently the period between 1000 and 1200 A.D. probably was about 1° C (1.8° F) warmer than today.<sup>22</sup>

This “Medieval Warm Period” was followed by a cold period, the “Little Ice Age,” from about 1450 to 1850 A.D.<sup>23</sup> Sea level fell until about 1850 and then began to rise at about the same time as temperatures, well *before* carbon dioxide emissions from heavy use of fossil fuel in the 20th century.<sup>24</sup> Warming and sea level rise that began in the 19th century were not caused by your carbon footprint in the 21st .

Even if reducing CO<sub>2</sub> emissions is important, we are getting a paltry return for the wildlife, land and money sacrificed to “renewable” but unreliable wind power. The wind blows intermittently: it may be breezy when demand for power is low and calm when demand is high.<sup>25</sup> When there is no wind, reliable sources (usually natural gas plants) must be “dispatched” to meet the shortfall.

This start-and-stop operation of natural gas plants generally will reduce their efficiency and can increase CO<sub>2</sub> emissions over what they would have been had the natural gas plants been permitted to operate continuously, at peak efficiency, without interruptions to accommodate intermittently available wind power.<sup>26</sup> Denmark and Germany, two pioneers in extensive deployment of wind power, have not reduced their use of other energy sources or emissions of CO<sub>2</sub> as a result.<sup>27</sup>

In the United States, on the other hand, CO<sub>2</sub> emissions have come down recently, partly because of the poor economy, but mostly because of the development of new sources of clean-burning natural gas such as the nearby Marcellus Shale.<sup>28</sup> Ironically, environmentalists resisted this development which has reduced the national carbon footprint far more than wind power has.

Worldwide use of fossil fuel and atmospheric concentrations of CO<sub>2</sub> continue to rise, but temperatures are not following suit. “[M]ajor climate research centres now accept that there has been a ‘pause’ in global warming since 1997.”<sup>29</sup> The Fifth Assessment Report of the United Nations’ Intergovernmental Panel on Climate Change (IPCC), published on September 27, 2013, claims that it is “extremely likely” that human use of fossil fuel has caused global warming since the 1950s, but grudgingly acknowledges that from 1998-2012 there has been a “reduction in surface warming trend” – IPCC-speak for no warming at all.

The IPCC has serious problems. The computer climate models that it relies

upon for its projections of dangerous global warming from CO<sub>2</sub> released by burning fossil fuel have been falsified by the observed lack of warming.<sup>30</sup> The IPCC models get all their main predictions wrong, and overstate potential temperature rise due to CO<sub>2</sub> by at least a factor of three.<sup>31</sup>

Delaware environmental groups have undertaken to instruct the public and the General Assembly about climate, energy technologies and sea level without demonstrating expertise in any of these areas, and without showing serious concern for wildlife destroyed by some forms of “renewable” energy.

Thanks in part to these groups, it is a statistical certainty that significant numbers of bats are being killed by wind turbines that have been partly paid for by all Delawareans that buy electric power in this State. Hawks and eagles are also at risk.

There is no climate crisis, and killing wildlife with an inferior technology, wind power, is a cure that is far worse for our environment than the nonexistent disease. Delaware politicians and environmental groups can start to redress the harm from past mistakes by working for the prompt repeal of Delaware’s Renewable Energy Portfolio Standards Act, 26 Del. C. §§ 351-364. ♦

## FOOTNOTES

1. 26 Del. C. §§ 351-364.
2. Matt Ridley, *Gas Against Wind*, published October 14, 2011, updated March 13, 2012, available at <http://www.rationaloptimist.com/blog/gas-against-wind>
3. Thomas H. Kunz, *et al.*, 2007. Ecological impacts of wind energy development on bats, *Frontiers in Ecology and the Environment*, 5(6):315-324 at 319.
4. Erich Schwartzel, “Pa. wind turbines deadly to bats, costly to farmers,” *Pittsburgh Post-Gazette*, July 17, 2011; Carolyn Beeler, “Pa.’s wind turbines killed 10,000 bats last year,” *Newsworks* (WHYY), July 19, 2011.
5. Beeler, *op. cit.*, quoting Tracy L. Mumma of the Pennsylvania Game Commission.
6. Paul M. Cryan, 2011. Wind Turbines As Landscape Impediments To The Migratory Connectivity of Bats, *Environmental Law*, 41:355, 357.

7. Jeffrey Buler *et al.*, 2012. Post-Construction Avian and Bat Impact Assessment of the University of Delaware Wind Turbine in Lewes DE.: Interim Report.

[http://www.ceoe.udel.edu/LewesTurbine/documents/lewes\\_turbine\\_interim\\_report\\_2012.pdf](http://www.ceoe.udel.edu/LewesTurbine/documents/lewes_turbine_interim_report_2012.pdf)

8. *Id.*
9. Schwartzel, *op. cit.*
10. 26 Del. C. § 354.
11. Buler, *op. cit.*
12. Joel E. Pagel *et al.*, 2013. Bald and Golden Eagle Mortalities at Wind Energy Facilities in the Contiguous United States, *Journal of Raptor Research*, 47(3):311-315.
13. Wind Power turbines in Altamont Pass threaten protected birds, *Los Angeles Times*, June 6, 2011.
14. *Id.*
15. *Los Angeles Times*, June 6, 2011.
16. Sierra, Jan. – Feb. 2007, quoted by Delaware Audubon on its web site: <http://www.delawareaudubon.org/conservation/windpowersettlement.html>
17. Oct. 23, 2013.
18. 26 Del.C. § 351(b).
19. <http://www.sosdelaware.org/how-you-can-help>
20. *Preparing for Tomorrow’s High Tide – Sea Level Rise Vulnerability Assessment for the State of Delaware*. DNREC, July 2012 at 7.
21. Ralph Hardy, *et al.*, 1982. *The Weather Book*, Boston: Little Brown & Co., p. 156.
22. *Id.*
23. *Id.*
24. Arthur B. Robinson *et al.*, 2007. Environmental Effects of Increased Carbon Dioxide, *Journal of American Physicians and Surgeons*, 12:79-90, Figs. 3 and 11, available at [http://www.oism.org/pproject/GWReview\\_OISM150.pdf](http://www.oism.org/pproject/GWReview_OISM150.pdf)
25. <http://www.wind-watch.org/faq-electricity.php>
26. *Id.*
27. *Id.*
28. Kevin Begos, “U.S. Carbon Emissions: 2012 Levels At 20 Year Low,” *Huffington Post*, August 16, 2012.
29. Hayley Dixon, “Global warming? No, actually we’re cooling, claim scientists,” *Telegraph*, Sept. 8, 2013.
30. David M.W. Evans, *The Skeptic’s Case – Who Are You Going to Believe—The Government Client Scientists or The Data?* (2012) at 4, available at <http://jonova.s3.amazonaws.com/guest/evans-david/skeptics-case.pdf>
31. *Id.* at 8.



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