



25th Minerals Management Service Information Transfer Meeting

The French Quarter * New Orleans * January 6 - 8, 2009



Viewshed Analyses for Alternative Energy Projects

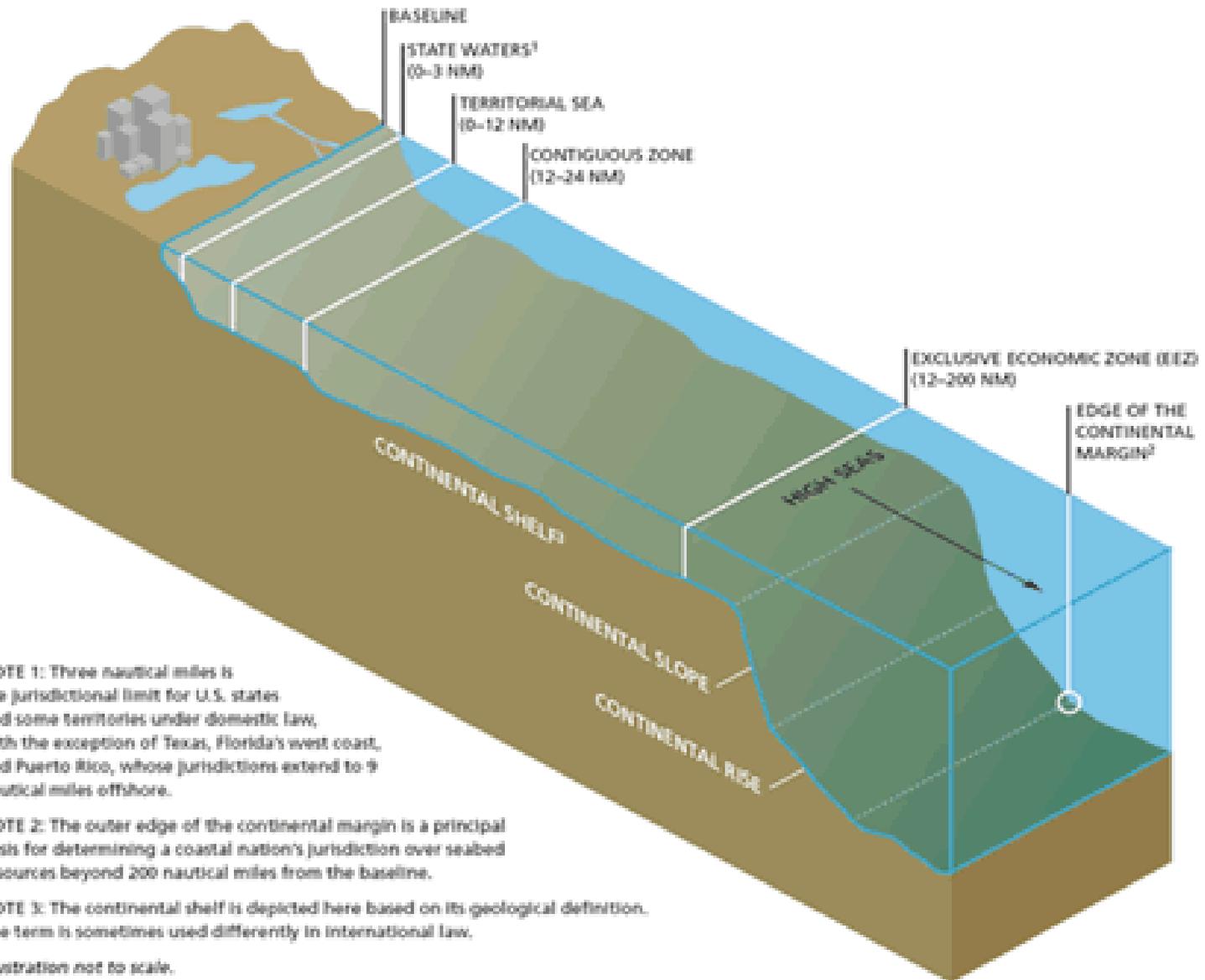
Joel I. Klein, Ph.D., RPA
John Milner Associates, Inc.



ENERGY POLICY ACT OF 2005

- Section 388 amended the OCS Lands Act
- Gave DOI authority to regulate Federal alternative energy on the OCS
- DOI delegated authority to MMS

Figure R.1 Lines of U.S. Authority in Offshore Waters



NOTE 1: Three nautical miles is the jurisdictional limit for U.S. states and some territories under domestic law, with the exception of Texas, Florida's west coast, and Puerto Rico, whose jurisdictions extend to 9 nautical miles offshore.

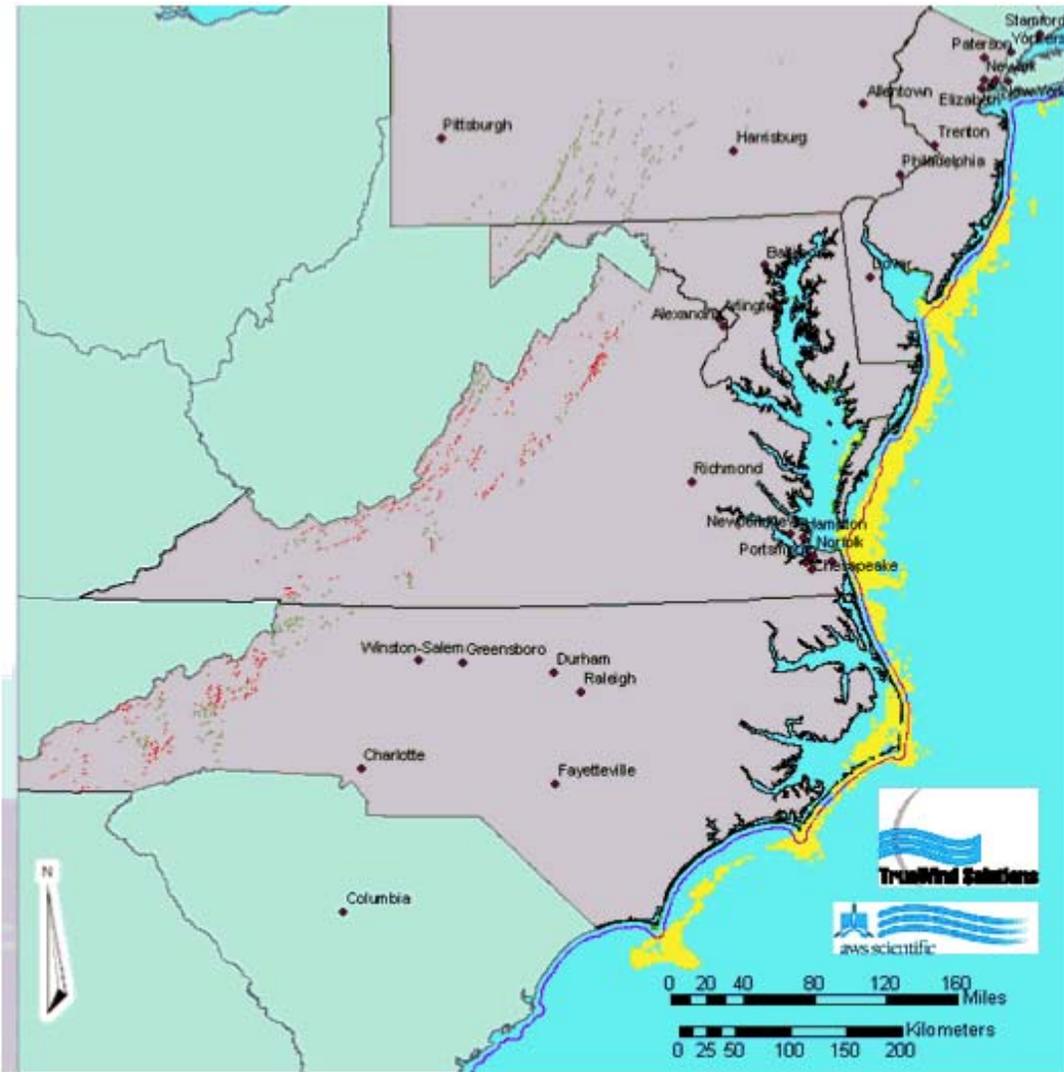
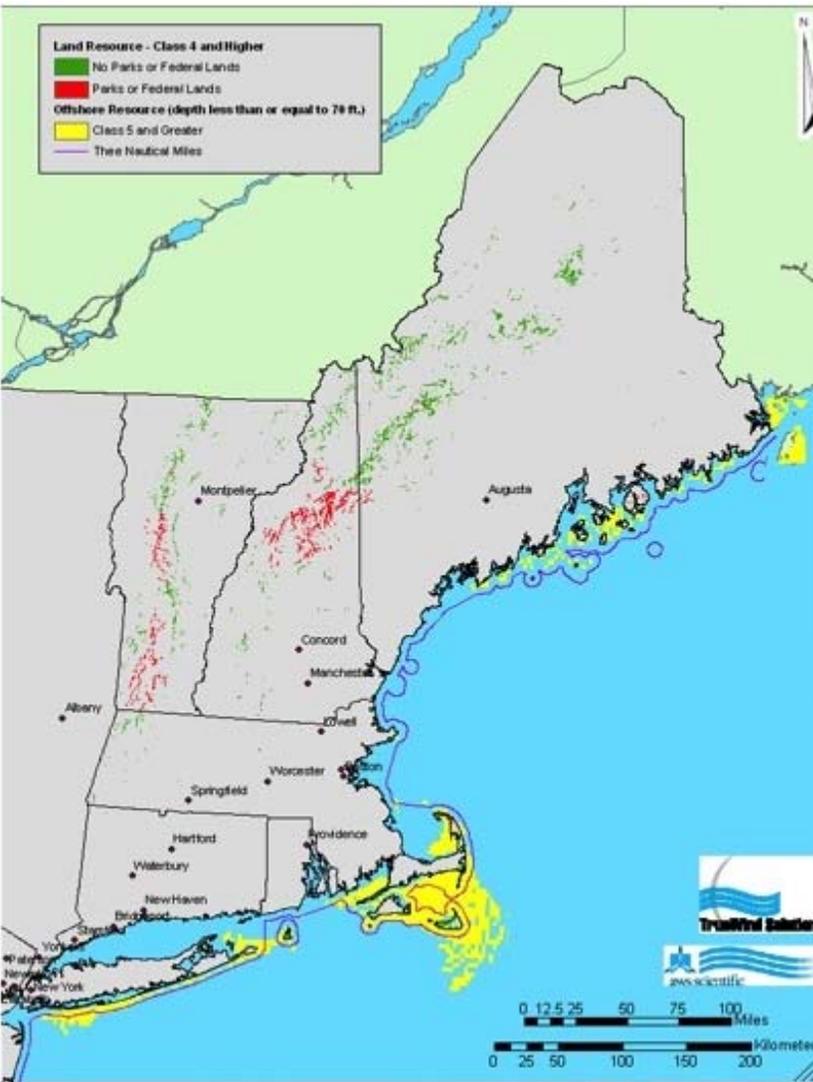
NOTE 2: The outer edge of the continental margin is a principal basis for determining a coastal nation's jurisdiction over seabed resources beyond 200 nautical miles from the baseline.

NOTE 3: The continental shelf is depicted here based on its geological definition. The term is sometimes used differently in international law.

Illustration not to scale.

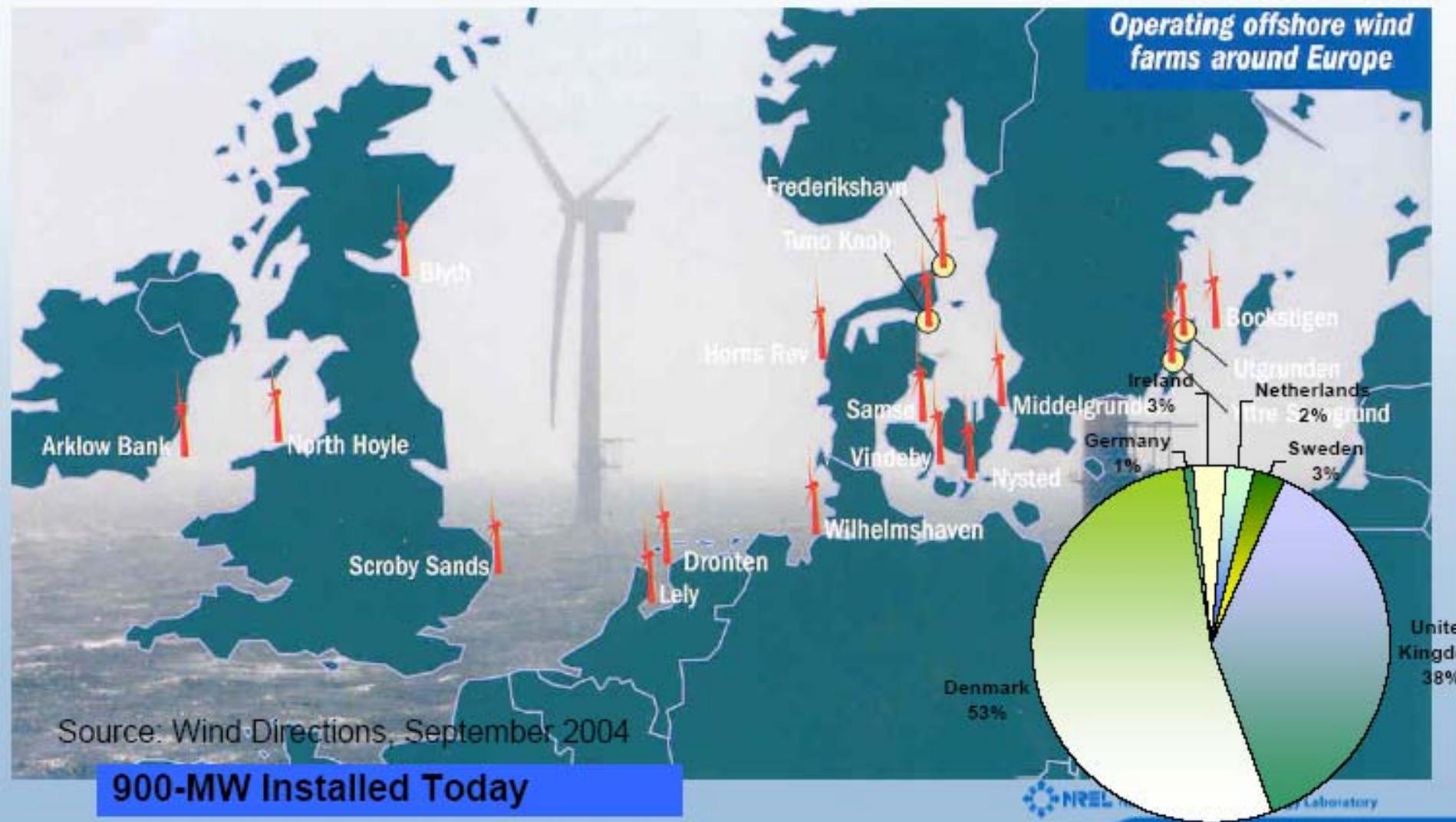
Several jurisdictional zones exist off the coast of the United States for purposes of international and domestic law. Within these zones, the United States asserts varying degrees of authority over offshore activities, including living and nonliving resource management, shipping and maritime transportation, and national security. A nation's jurisdictional authority is greatest near the coast.

Areas of Greatest Wind Power Potential

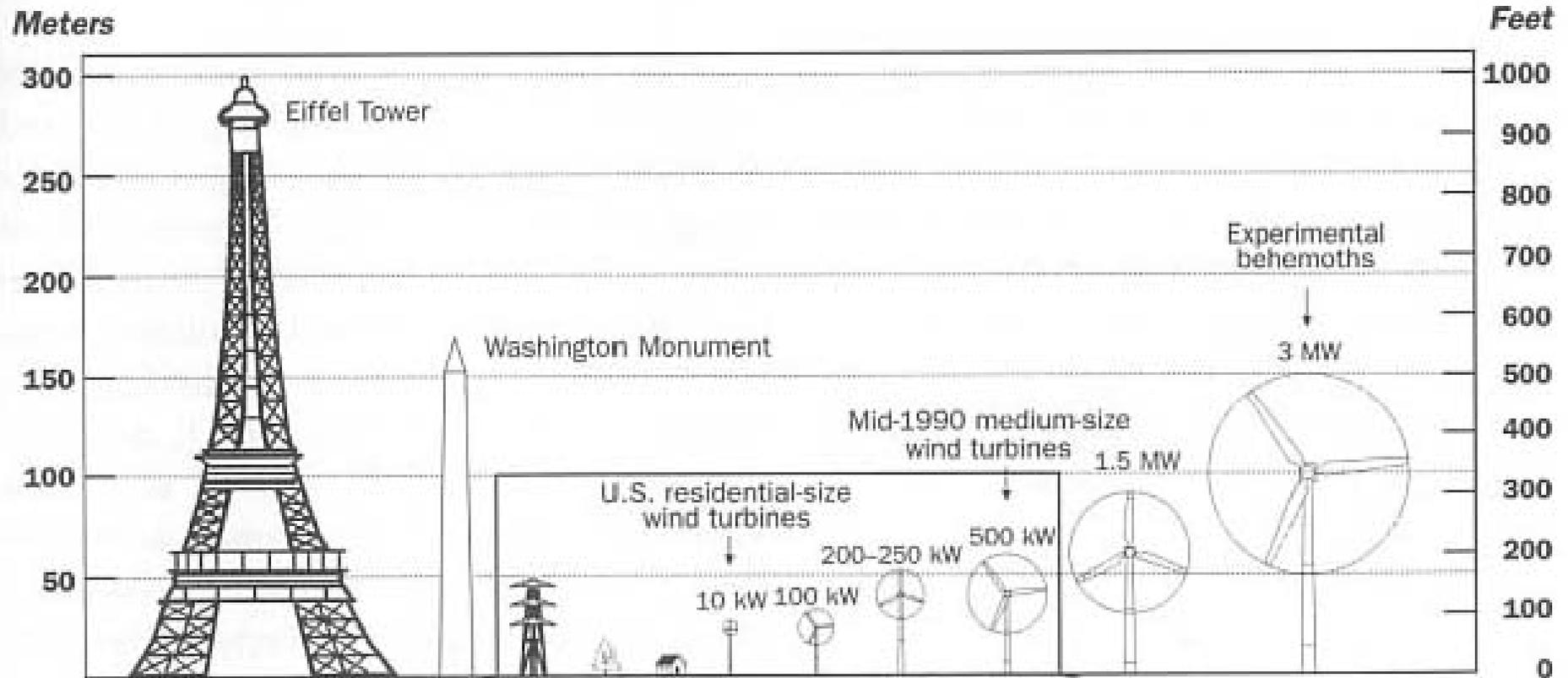




Location of Existing Offshore Installations Worldwide



WIND IS DIFFERENT



Small wind turbines produce from a few watts to 20 kilowatts. Micro and mini wind turbines are the tiniest machines in the small wind turbine family.



SHEFFIELD/SUTTON
tower = 78 meters
rotor diam. = 99 meters
sweep area = 1.9 acres
[strobe lit]

SEARSBURG
tower = 40 meters
rotor diam. = 40 meters
sweep area = 0.3 acres
[no lights]

198 feet

418 feet

305 feet



Utility Pole:
30 ft.

Transmission
Tower: 125 ft.

Wind Turbine:
up to 550 ft.

Forest Tree:
60 ft.





They Move !

JUSTICES GASP, GROAN OVER STATE'S LACK OF EXPERIENCE ON WIND TURBINES

"Justices of the West Virginia Supreme Court of Appeals gasped and groaned when Public Service Commission attorney John Auville told them the commission and its employees are learning about wind turbines as they go along."

NHPA Section 106

There is no Visual Resources
Protection Act

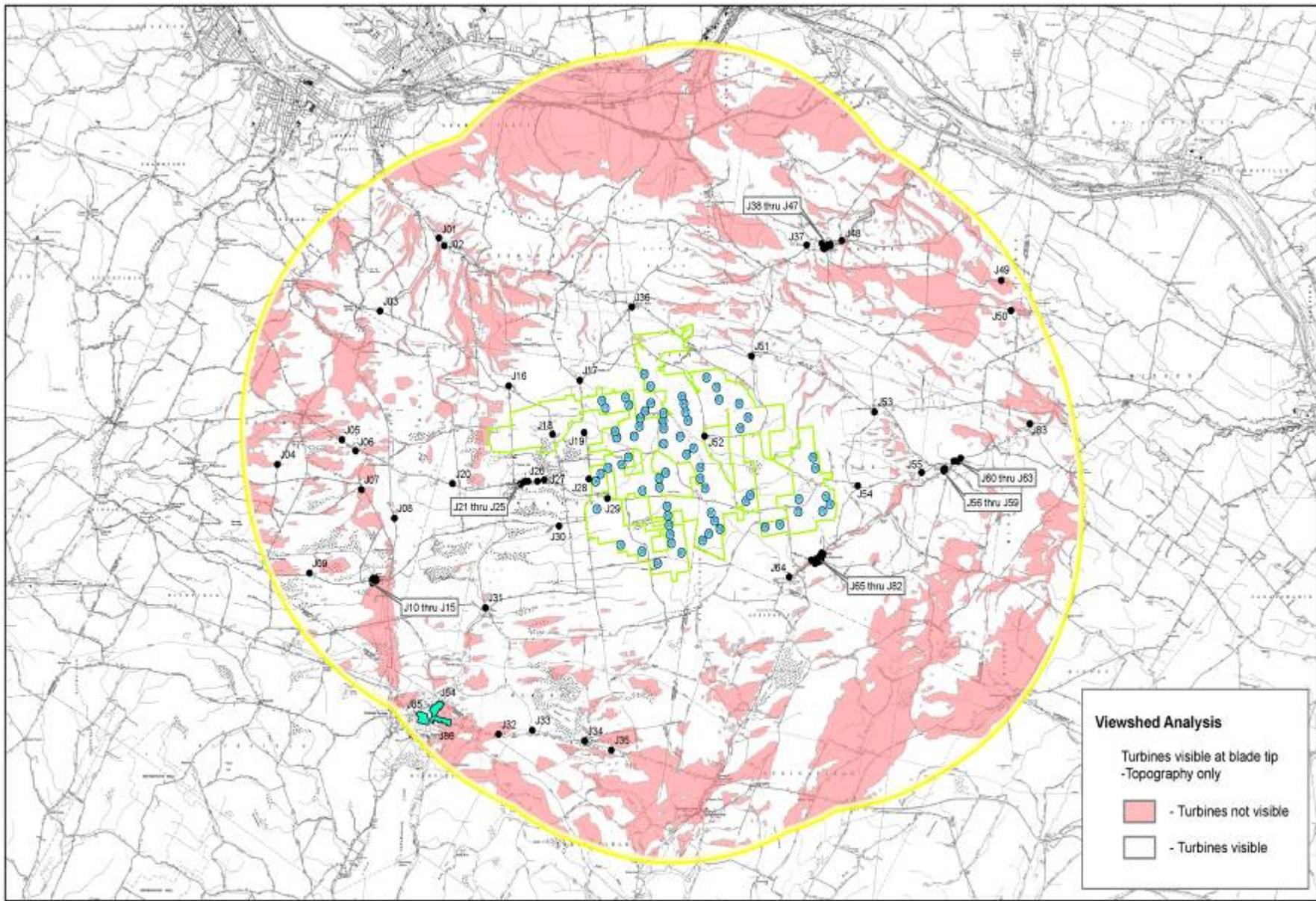
NHPA has become a mechanism
for addressing visual impact
concerns

AREA OF POTENTIAL EFFECT

AREA OF POTENTIAL EFFECT

36 CFR 800.16(d)

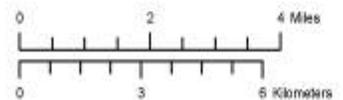
Area of potential effects means the geographic area or areas within which an undertaking may directly or indirectly cause alterations in the character or use of historic properties ...



Viewshed Analysis

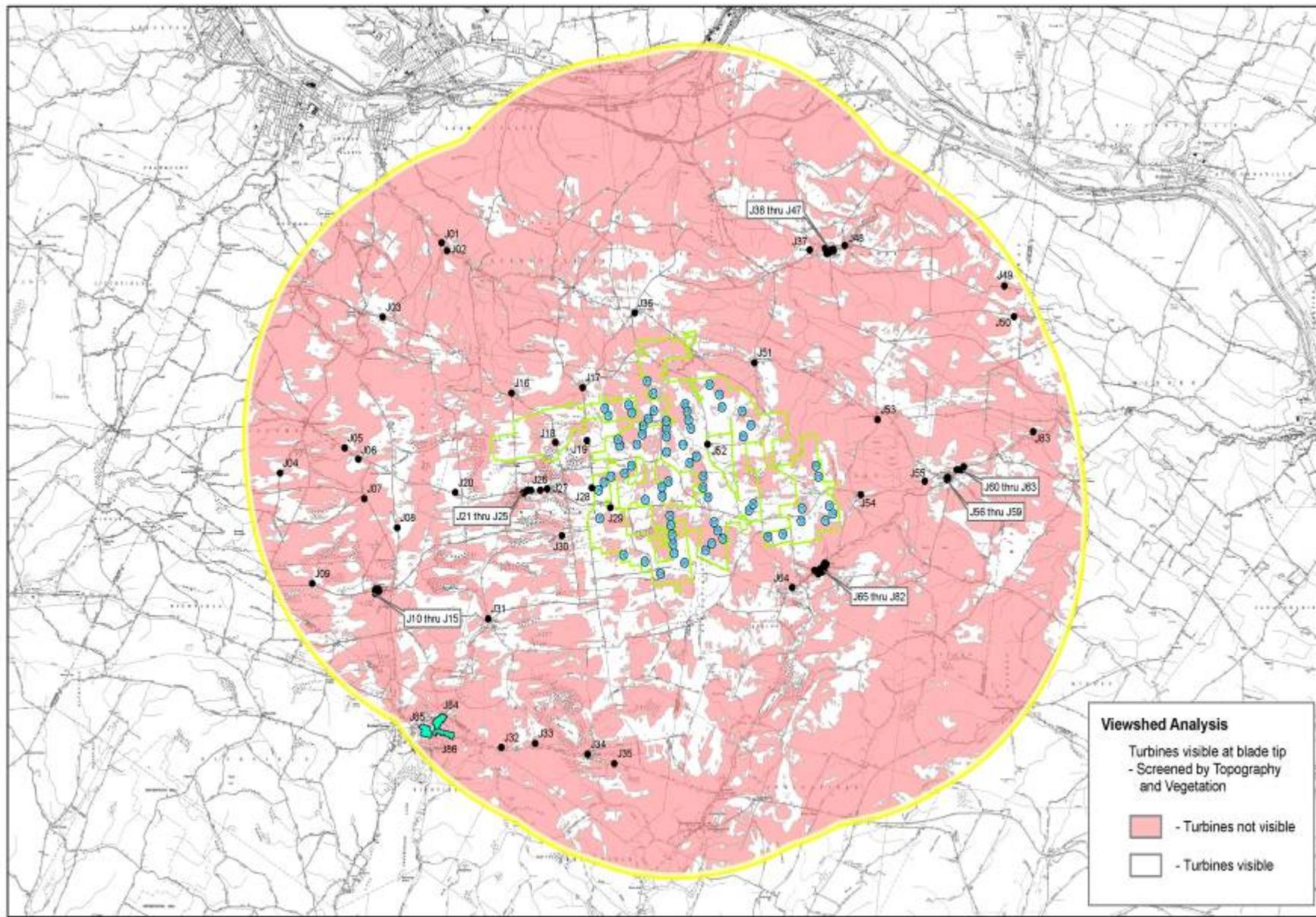
Turbines visible at blade tip
- Topography only

■ - Turbines not visible
□ - Turbines visible



- - Wind turbine location and ID number
- - Project area
- - 5 Mile buffer of project area
- - Historic Resources
- - Proposed Historic District

Figure: #
Jordanville Wind Farm
Viewshed Analysis - Top of blade with topography



Viewshed Analysis

Turbines visible at blade tip
- Screened by Topography and Vegetation

- Turbines not visible
 - Turbines visible

JMA architects archaeologists planners
John Miner Associates, Inc.

● - Wind turbine location and ID number
 - Project area
 - 5 Mile buffer of project area
● - Historic Resources
 - Proposed Historic District

Figure: #
 Jordanville Wind Farm
 Viewshed Analysis - Top of blade with vegetation



2 Miles

3 Miles

4 Miles

5 Miles

10 Miles

15 Miles

20 Miles





WHAT IS AN ADVERSE EFFECT?



CRITERIA OF ADVERSE EFFECT

36 CFR 800.9

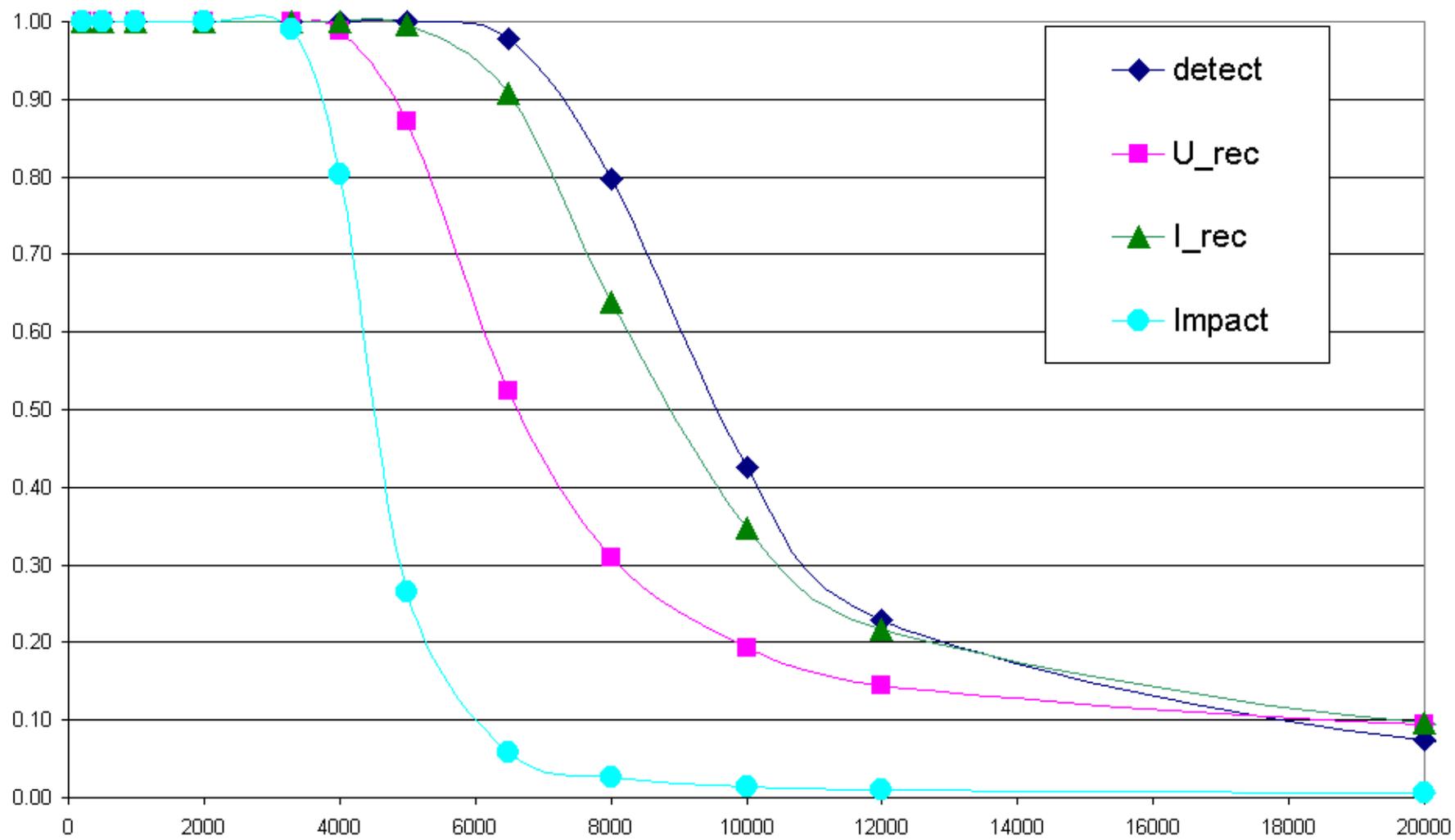
An undertaking is considered to have an adverse effect when the effect on a historic property may diminish the integrity of the property's location, design, setting, materials, workmanship, feeling, or association. Adverse effects on historic properties include, but are not limited to:

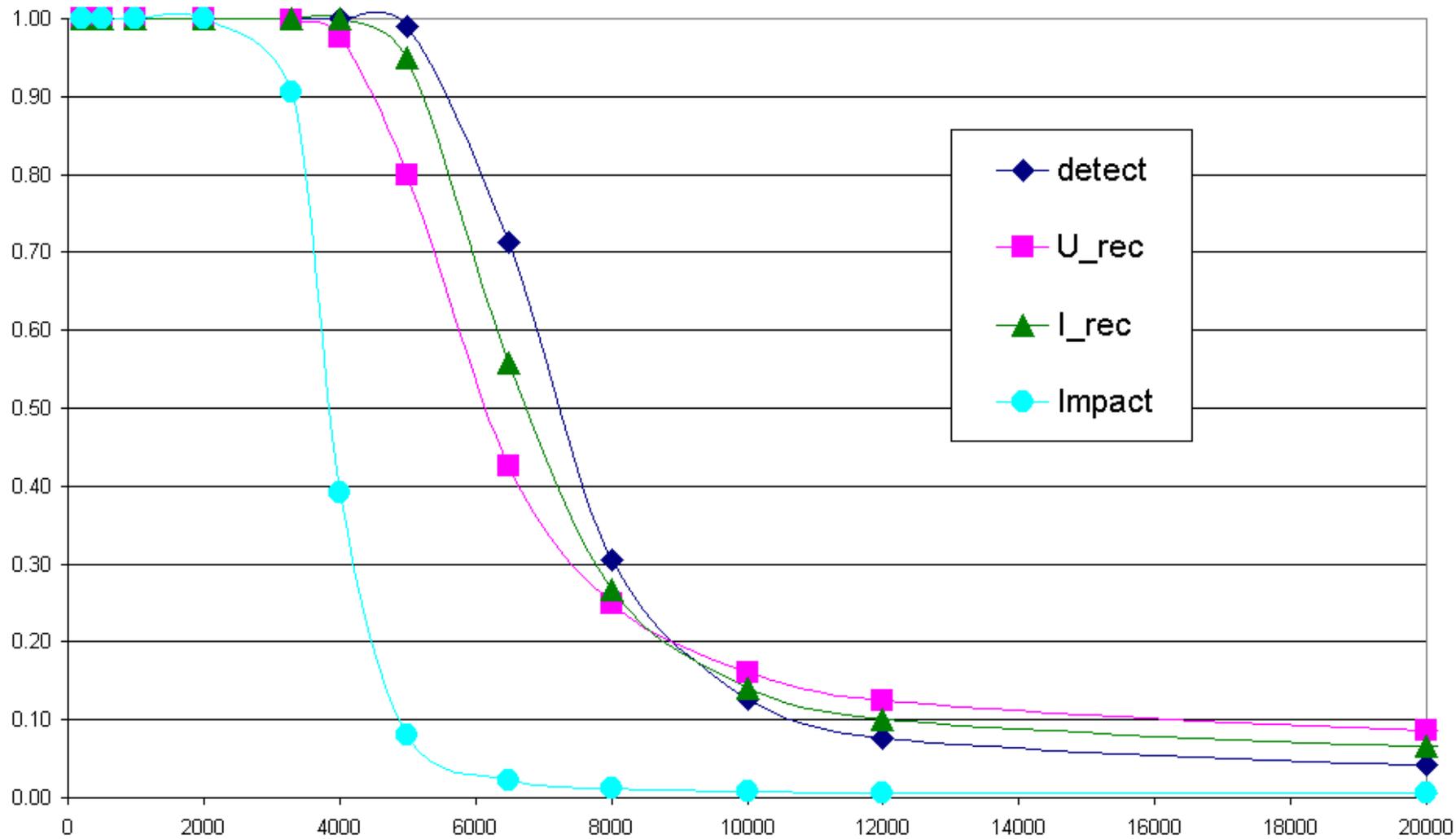


CRITERIA OF ADVERSE EFFECT

36 CFR 800.9

- **Physical destruction, damage, or alteration of all or part of the property;**
- **Isolation of the property from or alteration of the character of the property's setting when that character contributes to the property's qualification for the National Register;**
- **Introduction of visual, audible, or atmospheric elements that are out of character with the property or that alter its setting;**







View from Point Florence on Otsego Lake, Original Digital Photograph



View from Point Florence on Otsego Lake, Blue Sky with Wind Towers Visible



View from Point Florence on Otsego Lake, Photo Simulaton with Wind Towers Visible







**REAL
OR
SIMULATION?**







Viewer Orientation







response to

US Department of the Interior
Minerals Management Service

Request-for-Quote #M08PS00072

to conduct an

Evaluation of Visual Impact on
Historic Properties

prepared by

JMA architects
archeologists
planners
John Milner Associates, Inc.

in association with



18 June 2008

MAJOR TASKS

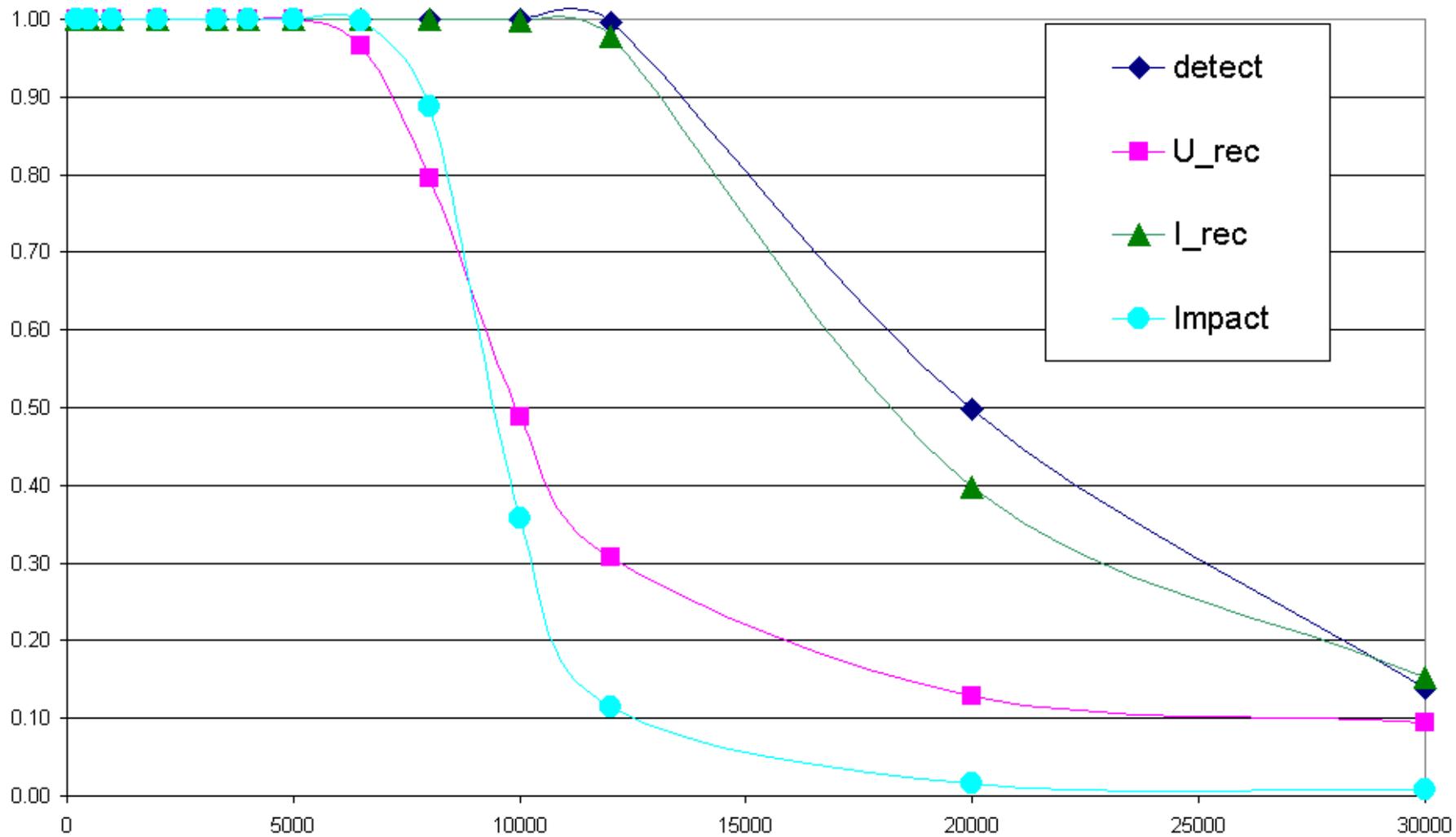
- Prepare base maps of the study area
- Identify and map recorded properties
- Identify previously unrecorded properties
- Compile GIS-based data base

Major Offshore Wind Farms as of 2006

Site/Country	Erected	Total Capacity	Distance to Shore	Water Depth	Foundation type
Middelgrunden/ Denmark	2001	40 MW	2 – 3 km	2 – 6 m	Concrete Caisson Gravity
Horns Rev/ Denmark	2002	160 MW	14 – 20 km	6 – 14 m	Driven mono pile with transition piece
Nysted/ Denmark	2003	160 MW	10 km	6 – 10 m	Concrete Caisson Gravity
Arklow Bank/ Ireland	2003	25 MW	7 – 12 km	5 m	Mono pile with transition piece
North Hoyle/ Wales	2003	60 MW	6 – 8 km	12 m + 8 m tide	Mono pile with transition piece
Scroby Sands/ UK	2004	60MW	2 – 3 km	max. 21 m (incl. bank variation)	Mono pile driven with pre-fitted flange
Barrow	2005	108 MW	7 km	21 - 23 m	Mono pile with transition piece
Burbo bank/ UK	2005	90 MW	6 – 7 km	6 – 10 m	Mono pile with transition piece
Kentish Flats	2005	90 MW	8 – 9 km	5 m	Mono pile with transition piece

Horns Rev, Denmark







A dramatic sunset scene with a line of wind turbines silhouetted against a bright orange and yellow sky. The foreground shows a dark, rocky coastline with a small boat in the water and a person's silhouette in the lower left.

THANK YOU!