## **Visual Simulations for Key Observation Point (KOP)**

# **Cumulative Impact**

BC02: North Brigantine Natural Area, Brigantine City, Atlantic County, New Jersey

Atlantic Shores Offshore Wind Final Environmental Impact
Study (FEIS), Appendix H
(Visual Simulations)

#### **Cumulative Impact of all Planned Offshore Wind Projects as of September 2024**

Each circle in this image represents where the turbines will be visible for each offshore wind turbine development project. The circles are color coded to match the project names in the legend and development project colors on the map. There are 6 projects that will be visible from the Brigantine Natural Area (North Beach Area).

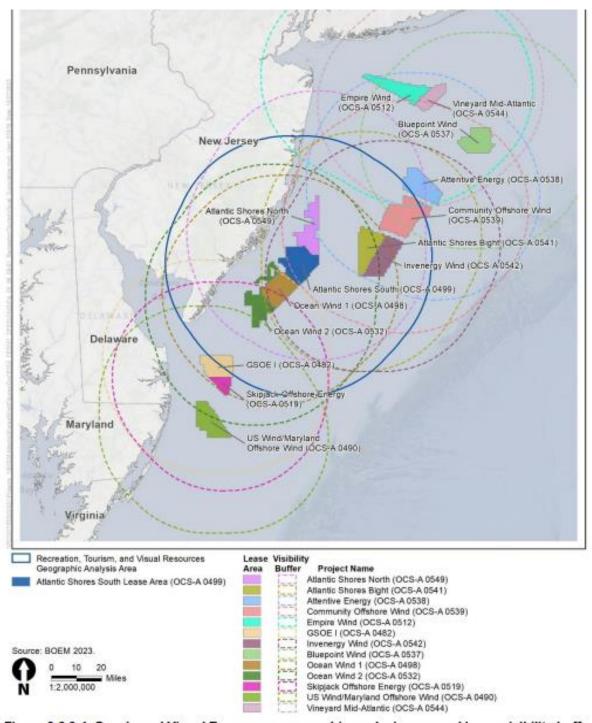


Figure 3.6.9-1. Scenic and Visual Resources geographic analysis area and lease visibility buffers

2



#### Reasonably Foreseeable Projects Represented in Photosimulation

Scenario 2			Height (feet)	Visible from KOP**	WTGs & OSSs in Project	Distance to Nearest Visible WTG (miles)	Distance to Furthest Visible WTG (miles)
Se	Atlantic Shores Offshore Wind South (OCS-A 0499)	2025-2027	1,047	205	205	9.0	23.8
	Ocean Wind (OCS-A 0498)	2023-2025	906	111	111	15.7	28.1
Scenario 1	Empire Wind (OCS-A 0512)	2024-2025	951	0	72	Not Visible	Not Visible
	Empire Wind II (OCS-A 0512)	2023-2027	951	0	104	Not Visible	Not Visible
	Skipjack (OCS-A 0519)	2024-2030	853	O	33	Not Visible	Not Visible
	Garden State (OCS-A 0482)	2023-2030	853	0	80	Not Visible	Not Visible
	US Wind (OCS-A 0489 and 0490)	2024	938	0 101		Not Visible	Not Visible
scenario s	Atlantic Shores Offshore Wind North (OCS-A 0549)	2025-2030	1,047	164	164	11.3	27.2
	Ocean Wind II (OCS-A 0532)	2026-2030	906	111	111	11.1	36.3
	Mid-Atlantic Offshore Wind (OCS-A 0544)	by 2030	853	0	104	Not Visible	Not Visible
	Ocean Wind East (OCS-A 0537)	by 2030	853	0	82	Not Visible	Not Visible
	Attentive Energy (OCS-A 0538)	by 2030	853	0	101	Not Visible	Not Visible
	Bight Wind Holdings (OCS-A 0539)	by 2030	853	0	148 Not Visible		Not Visible
	Atlantic Shores Offshore Wind Bight (OCS-A 0541) by 2030		853	71	95	37.5	43.0
	Invenergy Wind Offshore (OCS-A 0542)	by 2030	853	4 666	99	41.6	43.0
		Empire Wind (OCS-A 0512)  Empire Wind II (OCS-A 0512)  Skipjack (OCS-A 0519)  Garden State (OCS-A 0482)  US Wind (OCS-A 0489 and 0490)  Atlantic Shores Offshore Wind North (OCS-A 0549)  Ocean Wind II (OCS-A 0532)  Mid-Atlantic Offshore Wind (OCS-A 0544)  Ocean Wind East (OCS-A 0537)  Attentive Energy (OCS-A 0538)  Bight Wind Holdings (OCS-A 0539)  Atlantic Shores Offshore Wind 0539)  Atlantic Shores Offshore Wind Bight (OCS-A 0541)	Empire Wind (OCS-A 0512) 2024-2025  Empire Wind II (OCS-A 0512) 2023-2027  Skipjack (OCS-A 0519) 2024-2030  Garden State (OCS-A 0482) 2023-2030  US Wind (OCS-A 0489 and 0490) 2024  Atlantic Shores Offshore Wind North (OCS-A 0549) 2025-2030  Ocean Wind II (OCS-A 0532) 2026-2030  Mid-Atlantic Offshore Wind (OCS-A 0544) by 2030  Ocean Wind East (OCS-A 0537) by 2030  Attentive Energy (OCS-A 0538) by 2030  Bight Wind Holdings (OCS-A 0539) by 2030  Atlantic Shores Offshore Wind Bight (OCS-A 0541) by 2030	Empire Wind (OCS-A 0512) 2024-2025 951  Empire Wind II (OCS-A 0512) 2023-2027 951  Skipjack (OCS-A 0519) 2024-2030 853  Garden State (OCS-A 0482) 2023-2030 853  US Wind (OCS-A 0489 and 0490) 2024 938  Atlantic Shores Offshore Wind North (OCS-A 0549) 2025-2030 1,047  Ocean Wind II (OCS-A 0532) 2026-2030 906  Mid-Atlantic Offshore Wind (OCS-A 0544) by 2030 853  Ocean Wind East (OCS-A 0537) by 2030 853  Attentive Energy (OCS-A 0538) by 2030 853  Bight Wind Holdings (OCS-A 0539) by 2030 853  Atlantic Shores Offshore Wind Bight (OCS-A 0541) by 2030 853	Empire Wind (OCS-A 0512) 2024-2025 951 0  Empire Wind II (OCS-A 0512) 2023-2027 951 0  Skipjack (OCS-A 0519) 2024-2030 853 0  Garden State (OCS-A 0482) 2023-2030 853 0  US Wind (OCS-A 0489 and 0490) 2024 938 0  Atlantic Shores Offshore Wind North (OCS-A 0549) 2025-2030 1,047 164  Ocean Wind II (OCS-A 0532) 2026-2030 906 111  Mid-Atlantic Offshore Wind (OCS-A 0544) by 2030 853 0  Ocean Wind East (OCS-A 0537) by 2030 853 0  Attentive Energy (OCS-A 0538) by 2030 853 0  Bight Wind Holdings (OCS-A 0538) by 2030 853 0  Atlantic Shores Offshore Wind 0539) by 2030 853 71  Invenergy Wind Offshore Wind Bight (OCS-A 0541) by 2030 853 71	Empire Wind (OCS-A 0512) 2024-2025 951 0 72  Empire Wind II (OCS-A 0512) 2023-2027 951 0 104  Skipjack (OCS-A 0519) 2024-2030 853 0 33  Garden State (OCS-A 0482) 2023-2030 853 0 80  US Wind (OCS-A 0489 and 0490) 2024 938 0 101  Atlantic Shores Offshore Wind North (OCS-A 0549) 2025-2030 1,047 164 164  Ocean Wind II (OCS-A 0532) 2026-2030 906 111 111  Mid-Atlantic Offshore Wind (OCS-A 0537) by 2030 853 0 104  Ocean Wind East (OCS-A 0538) by 2030 853 0 82  Attentive Energy (OCS-A 0538) by 2030 853 0 101  Bight Wind Holdings (OCS-A 0539) by 2030 853 0 148  Atlantic Shores Offshore Wind Bight (OCS-A 0541) by 2030 853 71 95  Invenergy Wind Offshore Wind Bight (OCS-A 0541) by 2030 853 71 95  Invenergy Wind Offshore Wind Bight (OCS-A 0541) by 2030 853 71 95	Empire Wind (OCS-A 0512) 2024-2025 951 0 72 Not Visible  Empire Wind II (OCS-A 0512) 2023-2027 951 0 104 Not Visible  Skipjack (OCS-A 0519) 2024-2030 853 0 33 Not Visible  Garden State (OCS-A 0482) 2023-2030 853 0 80 Not Visible  US Wind (OCS-A 0489 and 0490) 2024 938 0 101 Not Visible  Atlantic Shores Offshore Wind North (OCS-A 0549) 2025-2030 1.047 164 164 113  Ocean Wind II (OCS-A 0532) 2026-2030 906 111 111 111 11.1  Mid-Atlantic Offshore Wind (OCS-A 0537) by 2030 853 0 104 Not Visible  Atlentive Energy (OCS-A 0538) by 2030 853 0 101 Not Visible  Bight Wind Holdings (OCS-A 0538) by 2030 853 0 101 Not Visible  Atlantic Shores Offshore Wind (OCS-A 0539) by 2030 853 0 148 Not Visible  Atlantic Shores Offshore Wind (OCS-A 0539) by 2030 853 71 95 37.5

Notes:

Officers Substation location and dimensions are based on preliminary publicly available project data. Projects for which this data is not currently available, WTGs are used for all foundation positions. OSS positions and dimensions considered in this photosimulation are subject to potential modification.

\*Historical meteorological data predicts wisblilly within a limit of 10 statute miles. However, visibility may extend beyond this distance. The photosimulations assume visibility extends to the limit of physical visibility (including a standard refraction in order.)

\*WTG positions in the photosimulations are based on a refraction value of 7/6 or an approximate 0.14 coefficient derived from observations of the constructed Block Island Wind Farm. This refraction coefficient may yield more conservative visibility results (i.e. greater turbine visibility) that the viewshed analysis results which use a refraction coefficient of 0.13.

\*"The number of WTGs visible from the KPP was determined by human verified computer generated courses performed in the 3D camera views considering screening resulting from viegetation, structures, curvature of the earth and refraction. This scoot may viry from the actual number of WTGs visible in the respective less of use to masking completed during post processing which may include people, waves, boats, or other minor obstructions that appear in account for up to 256 t. (72 m) is lost masking manner. The complete during post processing which may include people, waves, boats, or other minor obstructions that appear in account for up to 256 t. (72 m) is lost masking manner. The complete during post processing which may include people, waves, boats, or other minor obstructions that appear in account for up to 256 t. (72 m) is lost masking manner. The complete during post processing which may include people, waves, boats, or other minor obstructions that appear in account for up to 256 t. (72 m) is lost masking manner. The complete during post processing which may include peopl

Atlantic Shores chose the North Brigantine Natural Area as the Key Observation Point (KOP) in Brigantine. The KOP is the location in which the simulation of the visual impact of seeing the offshore wind turbines is taken. The visual impact of the turbines will be similar throughout Brigantine. The two photos in Atlantic Shores' visual impact studies are referred to as Panorama 1 and Panorama 2 of Scenario 3. Scenario 3 is the label used for the cumulative impact of ALL offshore wind PROJECTS. The two photo simulations represent the cumulative impact of all projects for Brigantine. But do they? Read the presentation below of how Atlantic Shores makes it impossible to see the cumulative impact in their photos.

Atlantic Shores designated additional KOPs up and down the NJ coast. Their simulations of the visual impact are also included in Appendix H. The instructions for reviewing the images of the wind turbines from each KOP will be the same as Brigantine's KOP. The impossibility of seeing a true representation of the visual impact of the wind turbines will be the same as well. The order of the presentation below is Panorama 2 followed by Panorama 1.

# BC02: North Brigantine Natural Area, Brigantine City, Atlantic County, New Jersey

Photosimulation (Panorama 2): Scenario 3: 2024-2030 Project construction added after the construction of Atlantic Shores South (Full Lease Build-out Including Atlantic Shores South)



### ATLANTIC SHORES offshore wind

Appendix A: Atlantic Shores Offshore Wind Cumulative Photosimulations

BC02: North Brigantine Natural Area, Brigantine City, Atlantic County, New Jersey

Photosimulation (Panorama 2): Scenario 3: 2024-2030 Project construction added after the construction of Atlantic Shores South (Full Lease Build-out Including Atlantic Shores South)



- ation Size: 66° in width by 29.3° in height. Images should be viewed from 18 inches in c
- Photosimulation Size: 66° in width by 28.3° in height Images should be viewed from 18 linches in or to obtain the proper perspective. For on-screen viewing, user should zoon in until the 1-inch scale equals exactly one inch when measured on the screen. Offichine Substation location and dimensions are based on preliminary publicly available project dat Projects for which this data is not currently available, WTGs are used for all frunchion positions. Of propositions and dimensions considered in this photosymistion are subject to potential modification. WTG positions in the photosimulations are based on a refraction value of 176 or an approximate of 34 confidence of the constructed Block Island WTG positions in the photosimulations are based on a refraction value of 176 or an approximate of 34 confidence from coherenteed floor. Substantial Block Island WTG Farm This inflaxion coefficient or 13.3° and 150 miles are substantially that the viewed and the state of the control confidence of 13.3° and 150 miles (2010). This has a verification confidence of 13.3° and 150 miles (2010). This has a refraction value of 150 miles (2010).
- WTG tower blades, and nacelle use the BOEM and FAA required color RAL 9010. The base and platf use RAL 1023 in accordance with USCG regulations.
   "The number of WTGs visible from the KCP was determined by human verified computer generated
- "The number of W LLS valide from the NLP Was determined by number where companies generalized counting performed in the SD carers of west considering sognetized production of the number of the second of the seco

- rotation pattern. Considering the largest WII Gi in the cumulative arrang this could account for up to it. (27 mi) in lateral analysis and assistance of the country of th

#### VIEWING IMAGE ON YOUR COMPUTER SCREEN

The most important part of the simulations is CIRCLED IN RED BELOW which is barely visible at the bottom left side of the page when viewing from your computer screen. See instructions written in bullet 1 in the NOTES by Atlantic Shores on next page. The instructions are telling the viewer to increase the size of the image until the "box" is 1 inch in length.

Atlantic Shores South Final EIS: Appendix H Seascape, Landscape, and Visual Impact Assessment (boem.gov) Pdf page 116

Simulation Size: 66" in width by 29.3" in height. Images should be viewed from a distance of 18 inches in order to obtain the proper perspective.

This box should be exactly 1" long on the printed panorama

The notes below could also result in distortions of the images presented. (see PDF page 117)

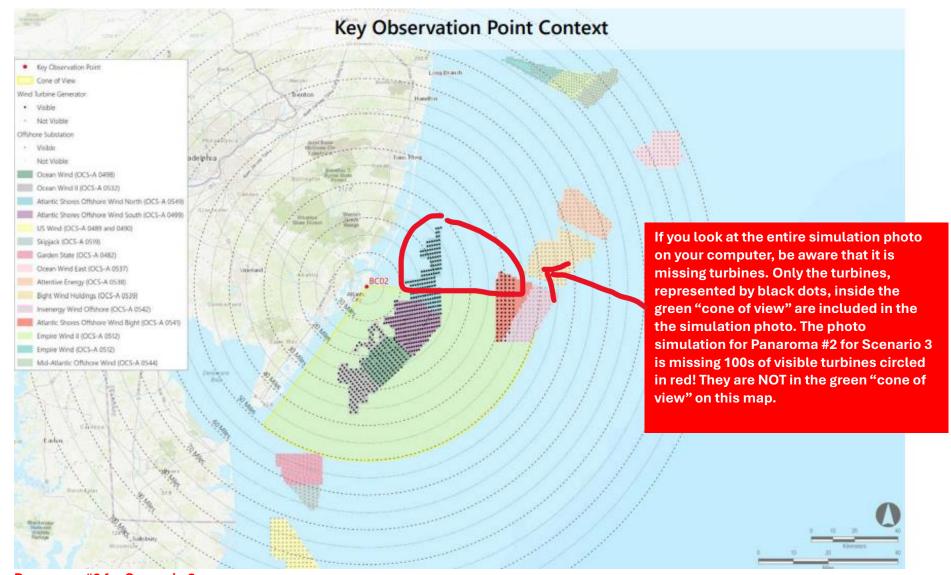
#### Notes:

- Photosimulation Size: 66" in width by 29.3" in height. Images should be viewed from 18 inches in order
  to obtain the proper perspective. For on-screen viewing, user should zoom in until the 1-inch scale
  equals exactly one inch when measured on the screen.
- Offshore Substation location and dimensions are based on preliminary publicly available project data.
   Projects for which this data is not currently available, WTGs are used for all foundation positions. OSS positions and dimensions considered in this photosimulation are subject to potential modification.
- WTG positions in the photosimulations are based on a refraction value of 7/6 or an approximate 0.14 coefficient derived from observations of the constructed Block Island Wind Farm. This refraction coefficient may yield more conservative visibility results (i.e. greater turbine visibility) that the viewshed analysis results which use a refraction coefficient of 0.13.
- WTG tower, blades, and nacelle use the BOEM and FAA required color RAL 9010. The base and platform
  use RAL 1023 in accordance with USCG regulations.
- \*The number of WTGs visible from the KOP was determined by human verified computer generated counts performed in the 3D camera views considering screening resulting from vegetation, structures, curvature of the earth and refraction. This count may vary from the actual number of WTGs visible in the respective views due to masking completed during post processing which may include people, waves, boats, or other minor obstructions that appear in the photograph. Additionally, the WTG counts assumed the WTG blades are in the upright position whereas the photosimulations assume a random rotation pattern. Considering the largest WTG in the cumulative array, this could account for up to 236 ft. (72 m) in lost maximum height depending on the rotation position.
- The cone of view indicated on the Key Observation Point Context map indicates the horizontal extent of view only and does not indicate the extent of WTG visibility.
- The resolution of the cumulative photosimulations balances the size and usability of the documents with the need for high resolution to see distant project components. Similarly to human vision, very distant turbines may appear blurry or difficult to decipher due to resolution limitations.
- The Key Observation Point Context map considers screening by curvature of the earth, viewer height, and turbine height. Landscape screening features are not considered. Therefore, in this view, the number of visible turbines depicted on the map may not match the table due to the presence of landscape screening features.



This is Panorama #2 of Scenario 3 visualization of the turbines for all projects after enlarging the image to achieve the 1-inch measurement per the instructions on the visualization. Only a portion of the picture from the **Atlantic Shores Document** fits on this page, and the turbines images are fuzzy from enlarging the image to achieve the 1 inch measurement legend. This WORD document is at 100%. Atlantic Shores breaks up the Panoramas (called 1 and 2) to either minimize the impact of the viewer experience or because they can't reproduce the entire view on a piece of paper. (see PDF page 116). **Atlantic Shores South Final EIS:** 

Appendix H Seascape, Landscape, and Visual Impact Assessment (boem.gov)

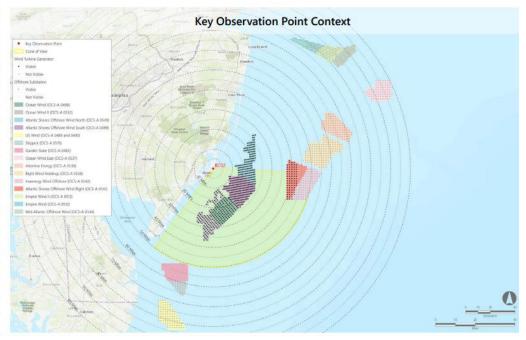


Panaroma #2 for Scenario 3

Cone of View is in the green part of the image (south portion of turbines). (see PDF page 116).

#### Below is the Cone of View (shaded green) along with the Table of visible wind turbines from all projects for Scenario 3, Panorama 2.

Project	Year of Development	Max Blade Tip Height (feet)	Potential Number of WTGs & OSSs Visible from KOP*	Total Number of WTGs & OSSs in Project	Theoretical Distance to Nearest Visible WTG (miles)	Theoretical Distance to Furthest Visible WTG (miles)
Atlantic Shores Offshore Wind South (OCS-A 0499)	2023-2025	1,047	205	205	9.0	23.8
Ocean Wind (OCS-A 0498)	2024-2025	906	ा॥	111	15.7	28.1
Empire Wind (OCS-A 0512)	2023-2027	951	0	72	Not Visible	Not Visible
Empire Wind II (OCS-A 0512)	2025-2027	951	0	104	Not Visible	Not Visible
Skipjack (OCS-A 0519)	2024-2030	853	0	33	Not Visible	Not Visible
Garden State (OCS-A 0482)	2023-2030	853	0	80	Not Visible	Not Visible
US Wind (OCS-A 0489 and 0490)	2024	938	0	101	Not Visible	Not Visible
Atlantic Shores Offshore Wind North (OCS-A 0549)	2025-2030	1,047	164	164	11.3	27,2
Ocean Wind II (OCS-A 0532)	2026-2030	906	111	111	11.1	36.3
Mid-Atlantic Offshore Wind (OCS-A 0544)	by 2030	853	0	104	Not Visible	Not Visible
Ocean Wind East (OCS-A 0537)	by 2030	853	0	82	Not Visible	Not Visible
Attentive Energy (OCS-A 0538)	by 2030	853	0	101	Not Visible	Not Visible
Bight Wind Holdings (OCS-A 0539)	by 2030	853	0	148	Not Visible	Not Visible
Atlantic Shores Offshore Wind Bight (OCS-A 0541)	by 2030	853	71	95	37.5	43.0
Invenergy Wind Offshore (OCS-A 0542)	by 2030	853	4	99	41.6	43.0



The table for the Panorama 2, Scenario 3 photo lists 666 visible turbines even though the photo is missing 100s of visible turbines!

#### (see PDF page 116).

BC02: North Brigantine Natural Area, Brigantine City, Atlantic County, New Jersey

Photosimulation (Panorama 1): Scenario 3: 2024-2030 Project construction added after the construction of Atlantic Shores South (Full Lease Build-out Including Atlantic Shores South)



# ATLANTIC SHORES offshore wind

Appendix A: Atlantic Shores Offshore Wind Cumulative Photosimulations

3CO2: North Brigantine Natural Area, Brigantine City, Atlantic County, New Jersey

Photosimulation (Panorama 1): Scenario 3: 2024-2030 Project construction added after the construction of Atlantic Shores south (Full Lease Build-out Including Atlantic Shores South)

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#### Notes:

- Photosimulation Size: 66' in width by 29.3' in height. Images should be to obtain the proper perspective. For on-screen wewing, user should zo: equals exactly one inch when measured on the screen.
- Offstore Substation location and dimensions are based on preliminary projects for which this data is not currently available, WTGs are used for postions and dimensions considered in this photosimulation are subject.
   WTG positions in the photosimulations are based on a refraction valid of the constructed Block Island coefficient may yield more conservations of the constructed Block Island coefficient may yield more conservative visibility results (i.e. greater turbin analysis results which use a refraction coefficient of 0.13.
- WTG tower blades, and nacelle use the BOEM and FAA required color Riuse RAL 1023 in accordance with USCG regulations.
- The number of WTGs visible from the KDP was determined by human vocunts performed in the 3D camera eviews considering screening result in curvature of the earth and refraction. This count may vary from the actual the respective views due to masking completed during post processing a waves, boats, or other minor obstructions that appear in the photograph assumed the WTG blades are in the upright position whereas the photos rotation pattern. Considering the largest WTG in the curval value array, this, (72 m) in lost maximum height depending on the rotation position. The cone of view indicated on the Key Observation Point Contest map in
- The cone of view indicated on the Key Observation Point Context map in view only and does not indicate the extent of WTG visibility.
- The resolution of the cumulative photosimulations balances the size and the need for high resolution to see distant project components. Similarly surbines may appear blurry or difficult to decipher due to resolution limit
- The Key Observation Point Context map considers screening by curvatur and turbine height. Landscape screening features are not considered. The of visible turbines depicted on the map may not match the table due to screening features.

#### VIEWING IMAGE ON YOUR COMPUTER SCREEN

The most important part of the simulations is CIRCLED IN RED BELOW which is barely visible at the bottom left side of the page. See instructions written in bullet 1 in the NOTES by Atlantic Shores on page 7. The instructions tell the viewer to enlarge the image until the "box" is 1 inch in length.

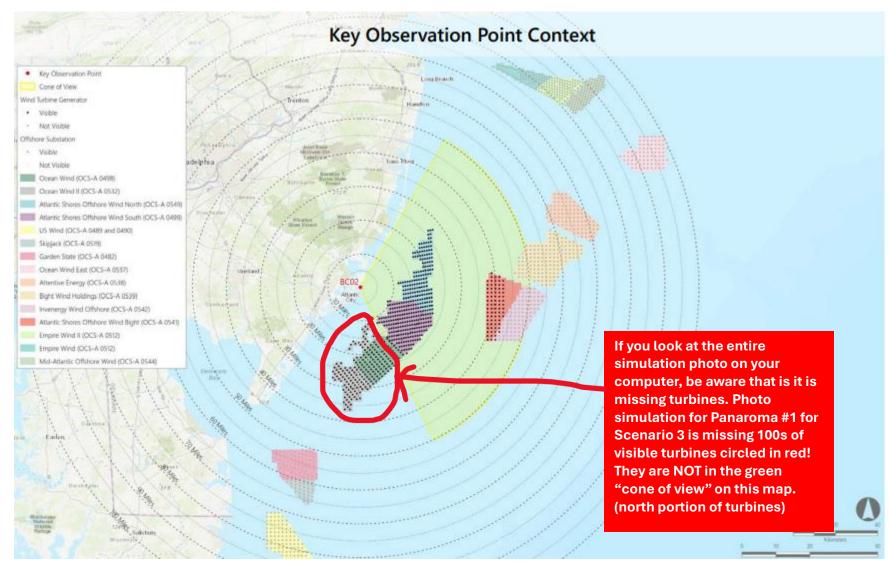
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Simulation Size: 66" in width by 29.3" in height. Images should be viewed from a distance of 18 inches in order to obtain the proper perspective.

This box should be exactly 1" long on the printed panorama



This is Panorama #1 for Scenario 3 - this is only a portion of the picture in the **Atlantic Shores document** because the whole picture doesn't fit on the page when it's enlarged to fit the 1-inch measurement per the instructions on the visualizations. It's basically the same image as Panorama#2. You can see the substation in each. **Atlantic Shores South** Final EIS: Appendix H Seascape, Landscape, and Visual Impact Assessment (boem.gov) PDF page 109



Panaroma #1 for Scenario 3

Cone of View is in the green part of the image (facing north)

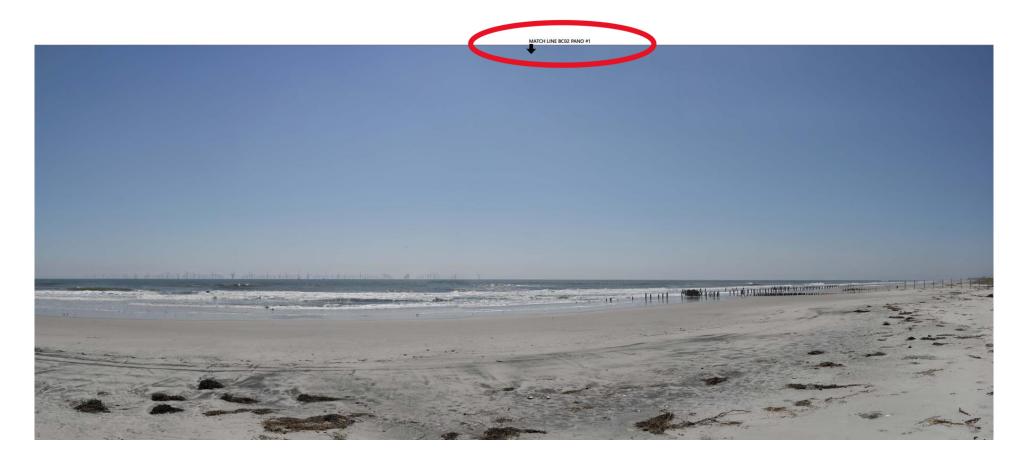
This is a picture of the cone of visibility (shaded in green) along with the list of turbines from all the projects in the green area.

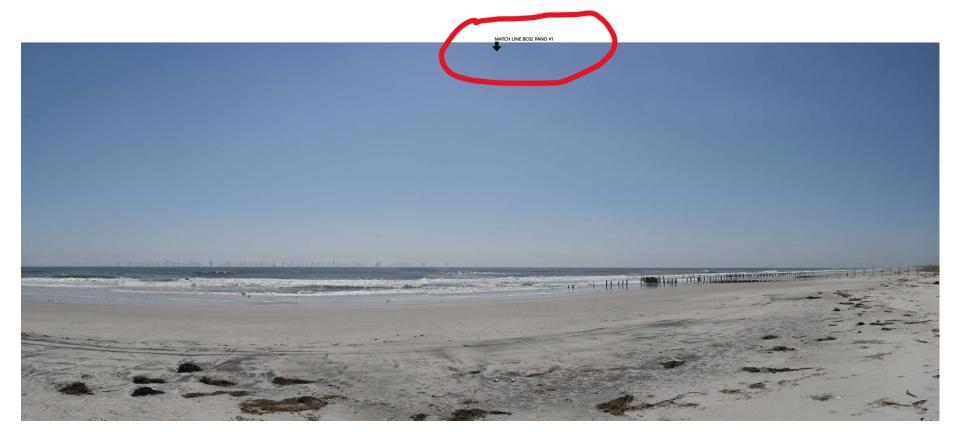


2000	Year of	Max Blade Tip Height	Potential Number of WTGs &	Total Number of WTGs	Theoretical Distance to Nearest	Theoretical Distance to Furthest	Key Observation Point Conte
Project	Development	(feet)	OSSs Visible from KOP*	& OSSs in Project	Visible WTG (miles)	Visible WTG (miles)	See Street     S
Atlantic Shores Offshore Wind South (OCS-A 0409)	2023-2025	1,047	205	205	9.0	218	The pales consort
Dorum Wind (DCS-A 0498)	2024-2025	906	=	101	15.7	281	
Impre Wind (DCS-A 05U)	2025-2027	161	0	72	Not Visible	Not Valor	The Section of the Se
rapes Wind II (OCS-A 0512)	2025-2027	951	0	104	Not Visible	Not Visible	- Mill Mark Street Phone and Not 200 A CARD
Skipjack (OCS-A 0519)	2074-2010	853	0	11	Not Violate	Not Visible	100 Napo (20 A 100)
Leden State (DCS-A 6462)	2023-2030	853	0	#D	Not Visible	Not Visible	IN Target (20) 4 (8)  Example (a)
US Wind (DCS-A 0489 and 0490)	2024	998	0	101	Not Visible	Not Visible	and the fact of the state of th
Atlantic Shores Diffshore Wind North (OCS-A 0549)	2025-2030	1,047	764	24	11.1	27.2	to the sea of the sea
onen Wind II (DCS-A 1532)	2076-2030	906	m	m	71.1	35.5	THE SAME OF THE PARTY OF THE SAME OF THE S
Vld-Atlantic Offshore Wind (DCS-A 0544)	by 2010	855		104	Not Visible	Not Valor	TAMES AND STREET
Ocean Wind East (OCS-A 0517)	by 2010	853	0	107	Not Visible	Not Valor	
Attentive Energy (DCS-A 0538)	by 2010	853	0	101	Not Visible	Not Visible	
ght Wind Holdings (DCS-A 0539)	by 2010	855	0	348	Not Violate	Not Visible	
Atlantic Shores Difebore Wind Bight (DCS-A (IS41)	by 2000	853	71	16	17.5	41.0	E TOTAL STATE OF THE STATE OF T
Invenergy Wind Offshore (DCS-A 8542)	by 2000	853	4	10	-41.0	43.0	

The table for the Panorama 1, Scenario 3 photo lists 666 visible turbines even though the photo is missing 100s of visible turbines!

At the top of both Panorama 1 and 2 for Scenario 3 photo simulations, Instructions are to "MATCH LINE BC02 PANO #1/ PANO#2. Does this mean that the pictures should be combined at this area to get an accurate simulation necessary to see the cumulative impact of all turbines? How is this even accomplished?





Atlantic Shores South Final EIS: Appendix H Seascape, Landscape, and Visual Impact Assessment (boem.gov)

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