

# Delivering global best practice in marine wildlife survey design

Offshore wind power is undoubtedly the next major source of clean energy in the United States as it is ideally placed to deliver offshore wind capable of supplying large amounts of affordable, reliable power.

**\$57b**

An estimated **\$57 billion investment in the US economy** will deliver up to **\$25 billion per year** in new economic activity and support up to **83,000 well-paying US jobs by 2030**.<sup>1</sup>

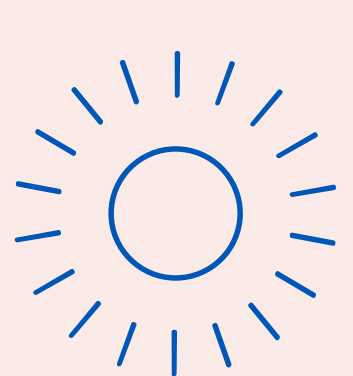
**x13**

In the US, developers plan to bring **9,100 MW** of offshore wind online by **2026** by developing **13 offshore wind projects**.<sup>2</sup>

**43,500 km<sup>2</sup>**

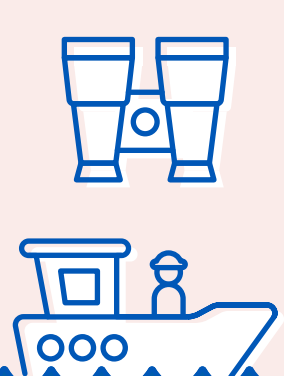
In 2016 the **world's largest** offshore aerial survey of marine wildlife covering **43,500km<sup>2</sup>** was commissioned by NYSDERA and delivered by the technical experts at APEM Inc and Normandeau Associates Inc.<sup>3</sup>

## Wildlife survey evolution for offshore wind developments



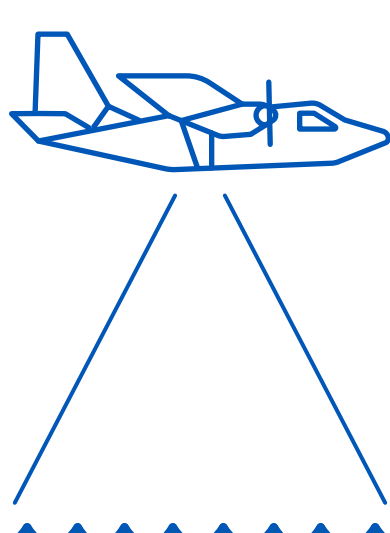
### Boat-based surveys

The **original method** of surveying marine wildlife carried out **visually** by field scientists using **binoculars and telescopes**.



### Visual aerial surveys

**Started in the mid-1970s**, usually carried out by field scientists flying at **very low altitudes**.



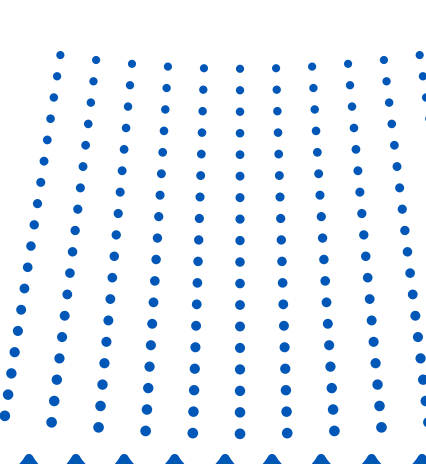
### Digital aerial image surveys

First trialled in the UK by **APEM in Carmarthen Bay, South Wales in 2009**. Images were captured at **7cm GSD**. Today APEM lead the way and deliver digital images as low as **1cm GSD**.



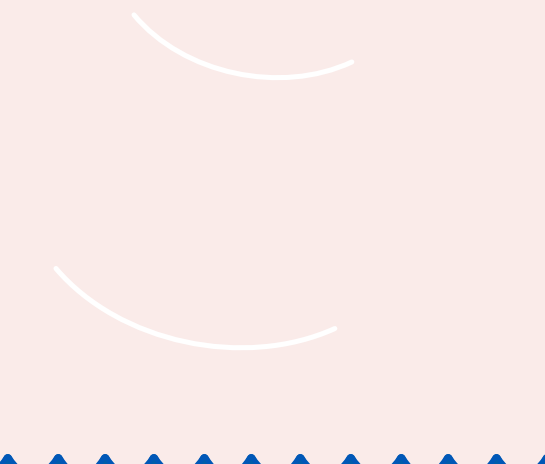
### Combined LiDAR surveys

First trialled by **APEM in 2019 at Race Bank OWF and Hornsea One OWF** in the UK. Now being used in **combination with digital aerial image surveys** in Europe and Australasia.



### The future...

Technology is advancing rapidly, with the **use of AI and satellites** for the collection of **marine wildlife survey data**.



Offshore wind facility design and engineering depends on site-specific conditions including the impact to wildlife. APEM have been supporting the global offshore wind industry since 2009 with ultra-high resolution digital aerial surveys.

Our technical experience is second to none and over the years we have fine-tuned our methodologies to ensure that we can provide the best possible advice that will deliver exactly what our clients require to meet the needs of the regulators.

In the surrounding marine environment off the east coast of the US we have delivered:

### Vineyard Wind, Massachusetts

767,000 images captured

156km<sup>2</sup> of sea investigated

### Mayflower, Massachusetts

686,000 images captured

306km<sup>2</sup> of sea investigated

### Beacon Wind, Massachusetts

1,034,000 images captured

173km<sup>2</sup> of sea investigated

### Empire Wind, New York

2,287,000 images captured

360km<sup>2</sup> of sea investigated

### Atlantic Shores, New Jersey

601,000 images captured

316km<sup>2</sup> of sea investigated

### Kitty Hawk, North Carolina

688,000 images captured

204km<sup>2</sup> of sea investigated

### GO-Wind, Gulf of Mexico

1,525,000 images captured

26km<sup>2</sup> of sea investigated

## A name you can trust

Whether a survey is being commissioned for a pre or post construction purpose, collection of baseline data, marine planning, condition monitoring or the provision of population estimates to inform environmental impact assessments, there is an art to ensuring that the right information and data is captured.

Offshore wind clients throughout the world trust APEM to advise and deliver the highest quality data and deliver a range of services including:

- Offshore aerial surveys of birds and marine mammals
- Environmental Impact Assessments (EIAs)
- Marine ecology consultancy
- Marine mammal consultancy
- Ornithology consultancy
- Onshore cable route surveys
- Modelling of seabird and marine mammal data



To find out more or discuss a need please visit [here](#).

1. [https://supportoffshorewind.org/wp-content/uploads/sites/6/2020/03/AWEA\\_Offshore-Wind-Economic-ImpactsV3.pdf](https://supportoffshorewind.org/wp-content/uploads/sites/6/2020/03/AWEA_Offshore-Wind-Economic-ImpactsV3.pdf)  
 2. <https://cleanpower.org/facts/offshore-wind/>  
 3. <https://www.apemtd.com/worlds-biggest-offshore-wildlife-aerial-survey-reaches-halfway/>