

The humpback whale unusual mortality event affecting New Jersey's coast is forcing us to evaluate our anthropogenic effects on our oceans organisms. This poster's purpose is to show which factors are of the utmost concern.

Introduction

Since 2016, the east coast of the United States from Maine to Florida has been experiencing increased amounts of stranded Humpback whales (*Megaptera novaeangliae*).

- This event is known as an unusual mortality event.
- The coast of New Jersey has had some of the most stranding with 28 since 2016.
- New Jersey has the most this year with 7 in 2023 (NOAA 2023).

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Humpback whale unusual mortality event in New Jersey risk factor assessment (vessel strikes) via GIS

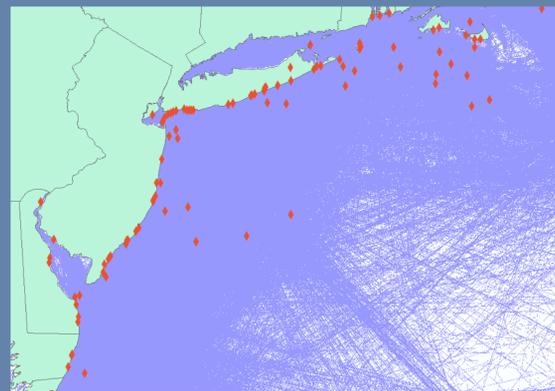


Figure 1. Arc map showing vessel traffic in black and the points are stranding's since 2016, cross referenced with vessel traffic.

Vessel strikes are one the leading causes of whale mortality in stranding's and are putting this species in direct risk.



Figure 2. Shows that the mean center of stranding's along the east coast is off the coast of southern new jersey

Humpback UME Stranding Locations													
ObjectID	Obs Date	Year	Month	Latitude	Longitude	Common Name	Sex	Carcass Condition	Country	State/Province	County	Field Number	
6	3/24/2016 5:00:00 AM	2016	Mar	39.720539	-74.121103	Whale, humpback	Unk	Moderate Decomposition	USA	NJ	Ocean	MMSC-16-030	
18	9/16/2016 5:00:00 AM	2016	Sep	39.169567	-74.678493	Whale, humpback	Male	Moderate Decomposition	USA	NJ	Cape May	MMSC-16-083	
22	11/18/2016 5:00:00 AM	2016	Nov	40.398667	-73.834333	Whale, humpback	Unk	Moderate Decomposition	USA	NJ	EEZ	NMFSGAR111816Mn	
27	1/12/2017 5:00:00 AM	2017	Jan	39.469517	-74.300101	Whale, humpback	Male	Fresh Dead	USA	NJ	Atlantic	MMSC-17-002	
33	2/11/2017 5:00:00 AM	2017	Feb	39.358997	-75.356589	Whale, humpback	Unk	Moderate Decomposition	USA	NJ	Cumberland	MMSC-17-008	
45	6/3/2017 5:00:00 AM	2017	Jun	39.6293	-73.9746	Whale, humpback	Unk	Fresh Dead	USA	NJ	Ocean	MMSC-17-092	
73	5/5/2018 5:00:00 AM	2018	May	40.4674	-74.0104	Whale, humpback	Male	Moderate Decomposition	USA	NJ	Monmouth	MMSC-18-104_AMCS53Mn2018	
75	5/22/2018 5:00:00 AM	2018	May	40.316861	-73.816917	Whale, humpback	Male	Moderate Decomposition	USA	NJ	Monmouth	MMSC-18-130	
104	8/10/2019 5:00:00 AM	2019	Aug	40.33875	-73.92265	Whale, humpback	Female	Advanced Decomposition	USA	NJ	Monmouth	MMSC-19-147	
107	10/4/2019 5:00:00 AM	2019	Oct	39.138255	-75.409333	Whale, humpback	Unk	Moderate Decomposition	USA	NJ	Cumberland	MMSC-19-172	
108	10/9/2019 5:00:00 AM	2019	Oct	39.773099	-74.094958	Whale, humpback	Male	Moderate Decomposition	USA	NJ	Ocean	MMSC-19-177	
109	10/18/2019 5:00:00 AM	2019	Oct	39.895392	-74.079367	Whale, humpback	Unk	Moderate Decomposition	USA	NJ	Ocean	MMSC-19-181	
110	10/28/2019 5:00:00 AM	2019	Oct	39.898979	-74.032293	Whale, humpback	Unk	Fresh Dead	USA	NJ	Ocean	MMSC-19-185	
126	4/30/2020 5:00:00 AM	2020	Apr	40.513333	-73.905555	Whale, humpback	Male	Moderate Decomposition	USA	NJ	Monmouth	MMSC-20-073	
137	9/16/2020 5:00:00 AM	2020	Sep	39.316604	-74.457123	Whale, humpback	Female	Moderate Decomposition	USA	NJ	Atlantic	MMSC-20-144_AMCS140Mn2020	
139	11/4/2020 5:00:00 AM	2020	Nov	39.001394	-74.706667	Whale, humpback	Female	Moderate Decomposition	USA	NJ	Cape May	MMSC-20-156	
145	12/4/2020 5:00:00 AM	2020	Dec	39.730746	-74.119083	Whale, humpback	Male	Moderate Decomposition	USA	NJ	Ocean	MMSC-20-160	
161	5/24/2022 5:00:00 AM	2022	May	39.120043	-74.729595	Whale, humpback	Unk	Advanced Decomposition	USA	NJ	Cape May	MMSC-22-072	
163	7/9/2022 5:00:00 AM	2022	Jul	39.045933	-74.74333	Whale, humpback	Male	Moderate Decomposition	USA	NJ	Cape May	MMSC-22-095	
172	12/10/2022 5:00:00 AM	2022	Dec	39.18651	-74.665974	Whale, humpback	Female	Fresh Dead	USA	NJ	Cape May	MMSC-22-151	
174	12/23/2022 5:00:00 AM	2022	Dec	39.350358	-74.446868	Whale, humpback	Female	Moderate Decomposition	USA	NJ	Atlantic	MMSC-22-154	
176	1/7/2023 5:00:00 AM	2023	Jan	39.352564	-74.438584	Whale, humpback	Female	Moderate Decomposition	USA	NJ	Atlantic	MMSC-23-001	
178	1/12/2023 5:00:00 AM	2023	Jan	39.43341	-74.336033	Whale, humpback	Unk	Unknown	USA	NJ	Atlantic	MMSC-23-002	
180	1/18/2023 5:00:00 AM	2023	Jan	39.338889	-73.585	Whale, humpback	Unk	Moderate Decomposition	USA	NJ	Ocean	MMSC-23-003	
181	1/28/2023 5:00:00 AM	2023	Jan	39.664167	-73.686389	Whale, humpback	Unk	Unknown	USA	NJ	Atlantic	MMSC-23-005	
185	2/13/2023 5:00:00 AM	2023	Feb	40.121933	-74.017014	Whale, humpback	Female	Moderate Decomposition	USA	NJ	Monmouth	MMSC-23-015-Mn_AMCS018Mn2023	
187	3/1/2023 5:00:00 AM	2023	Mar	39.931917	-74.071392	Whale, humpback	Female	Moderate Decomposition	USA	NJ	Ocean	MMSC-23-016-Mn	
190	3/23/2023 5:00:00 AM	2023	Mar	39.763611	-71.24555	Whale, humpback	Unk	Moderate Decomposition	USA	NJ	EEZ	PENDING	

Table 1. Shows the stranding data for humpback whales in New Jersey

In the figures, the orange diamonds represent whale stranding's and the purple lines show vessel traffic, there is more traffic where the purple is more dense. The above figures (Figure 1. and Figure 2.) show data from NOAA that illustrates the stranding data by state along with vessel traffic (Vessel traffic one of the leading stranding causes). Figure 2. shows that the mean center of all stranding in the UME is off the coast of New Jersey.

Results

The results of the map show that vessel strikes are a large risk for humpback whales in New Jersey all of the stranding's were in line with vessel transit lanes.

Methods

The methods used to create this map were:

- Find stranding data
- Add data to map
- Evaluate and cross reference stranding's and vessel traffic (visual overview)
- Use mean center tool to show mean center of stranding's.
- Conduct (GIS data from NOAA)

Conclusions

Vessel traffic is in a direct path with whales putting them at a high risk. This can be seen due to each stranding occurring in areas of high vessel traffic.