

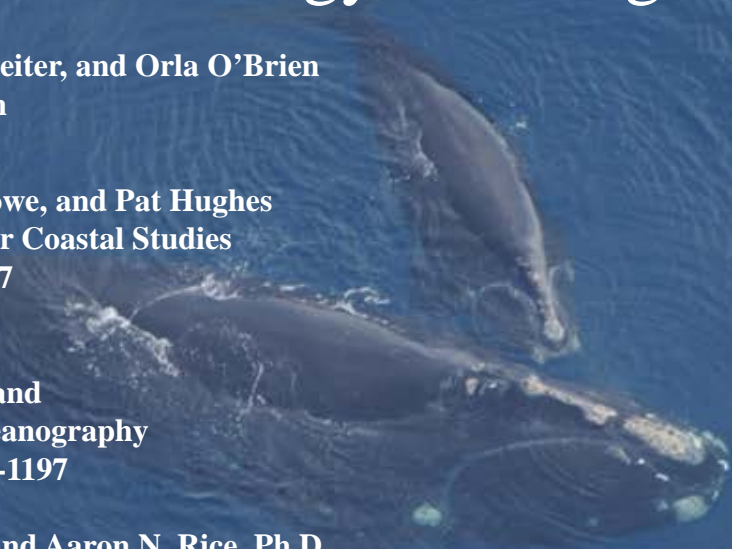
Field Studies of Whales, Dolphins, and Sea Turtles for Offshore Alternative Energy Planning in Massachusetts

Scott D. Kraus, Ph.D., Sarah Leiter, and Orla O'Brien
New England Aquarium
Boston, MA 02110

Charles Mayo, PhD., Leah Crowe, and Pat Hughes
Provincetown Center for Coastal Studies
Provincetown, Ma 02657

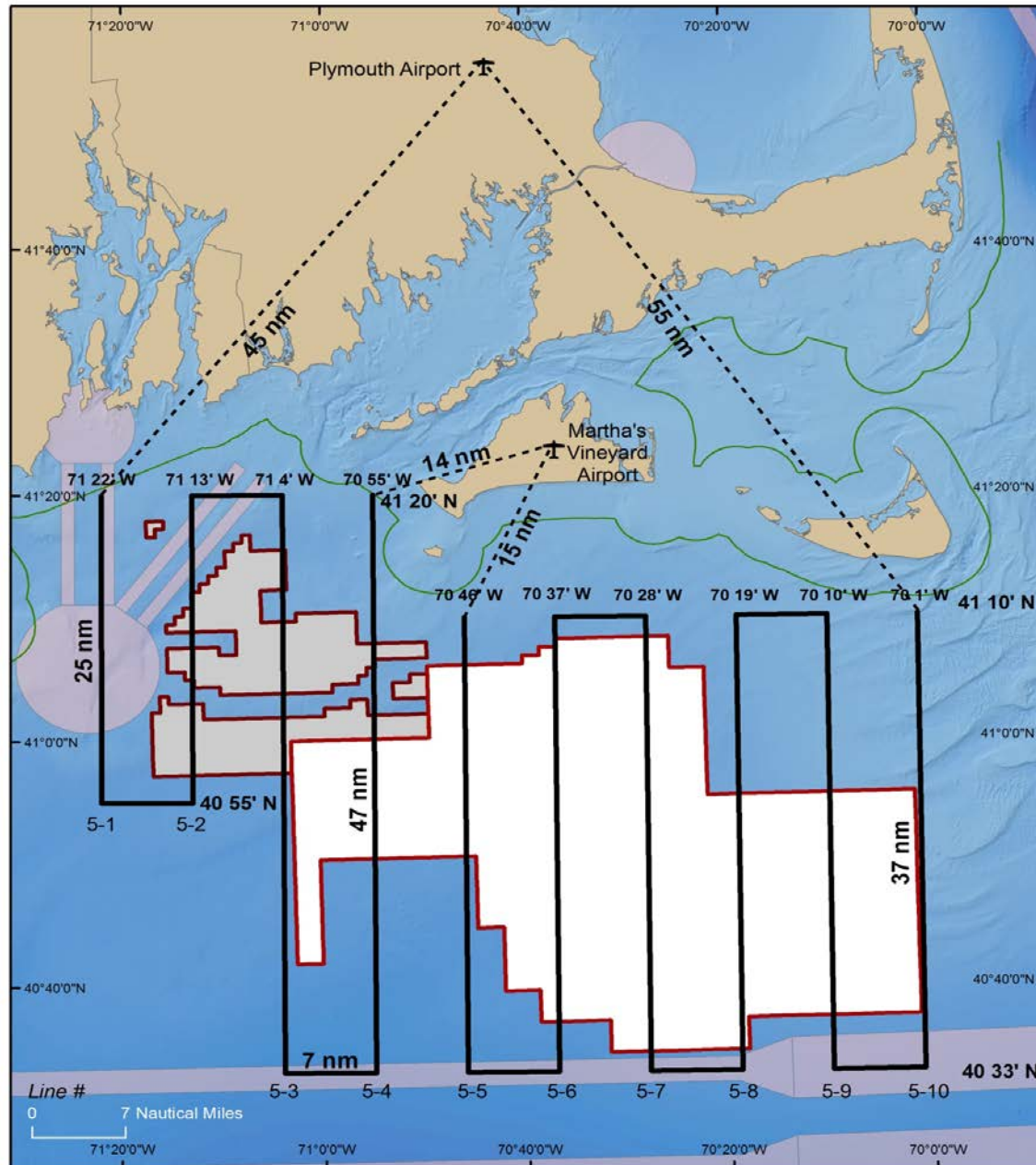
Robert D. Kenney, Ph.D.
University of Rhode Island
Graduate School of Oceanography
Narragansett, RI 02882-1197

Christopher W. Clark, Ph.D. and Aaron N. Rice, Ph.D.
Bioacoustics Research Program
Cornell Lab of Ornithology
Cornell University
Ithaca, NY, 14850, USA

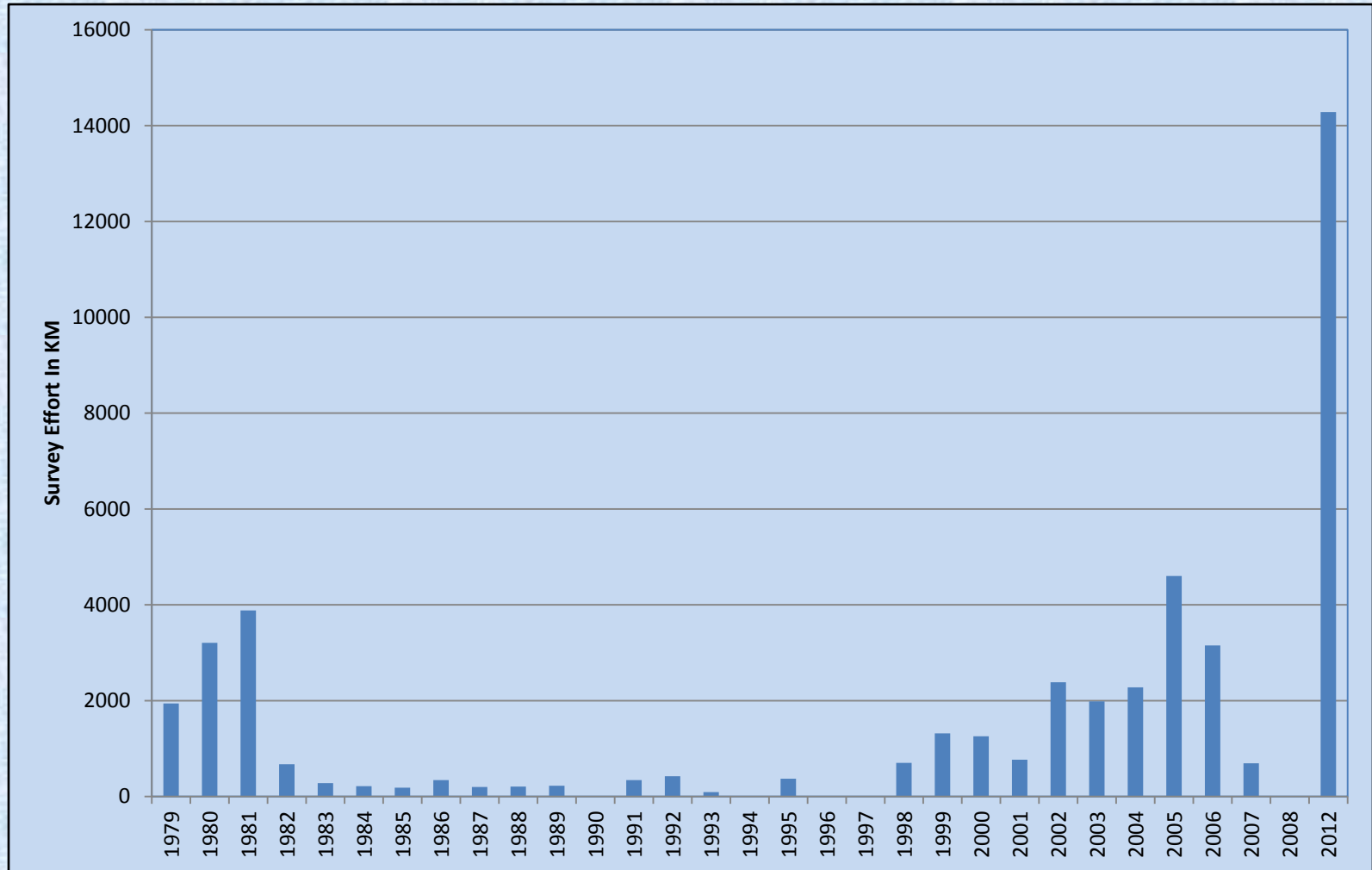


Start line: W to E - Line #5-1: 41 20' N, 71 22' W
E to W - Line #5-10: 41 10' N, 70 1' W

Option #5

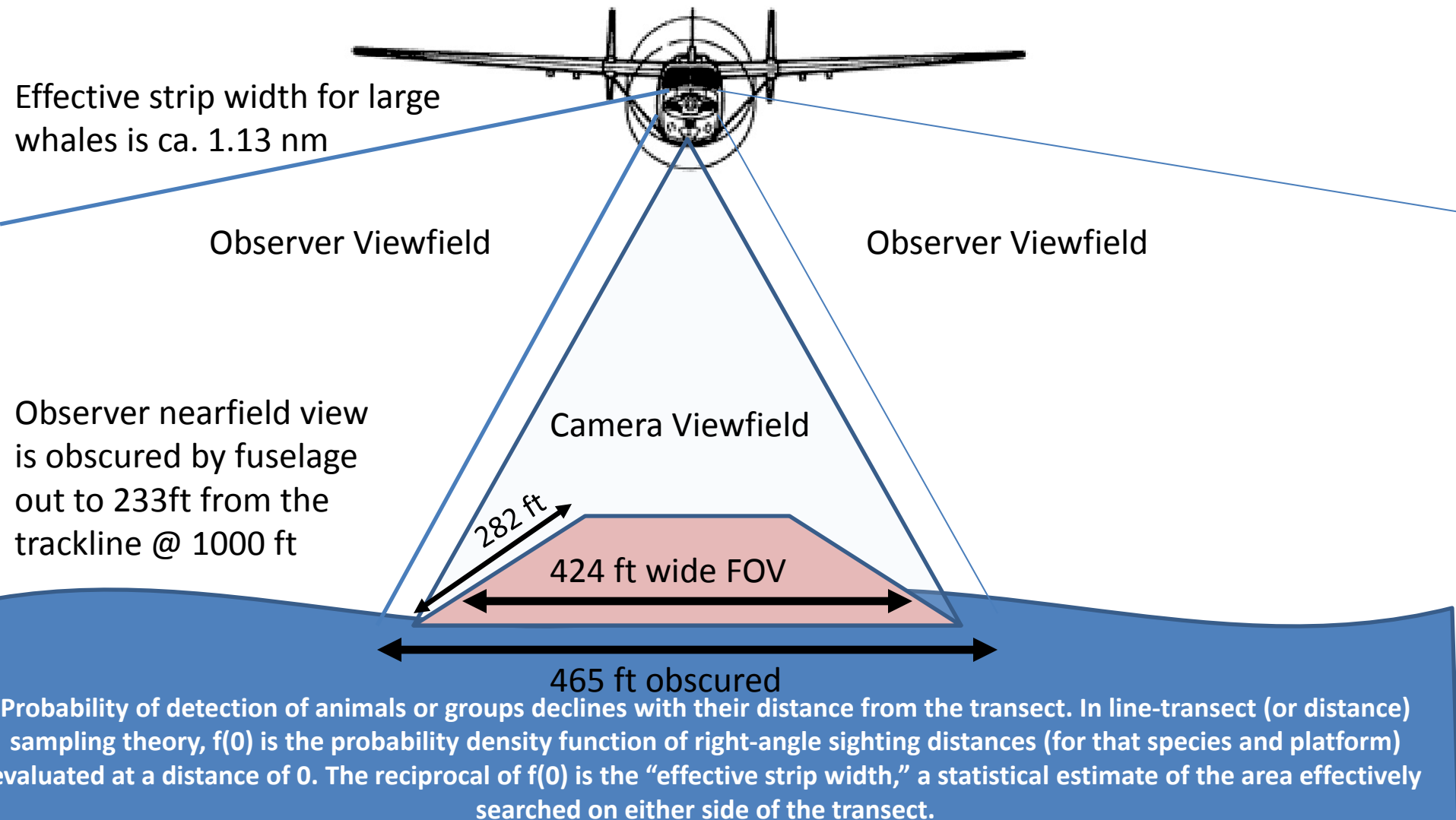


Comparison of historic effort (1979 - 2007), and the first year of MA CEC survey effort data. Bars represent kilometers of survey in suitable conditions.

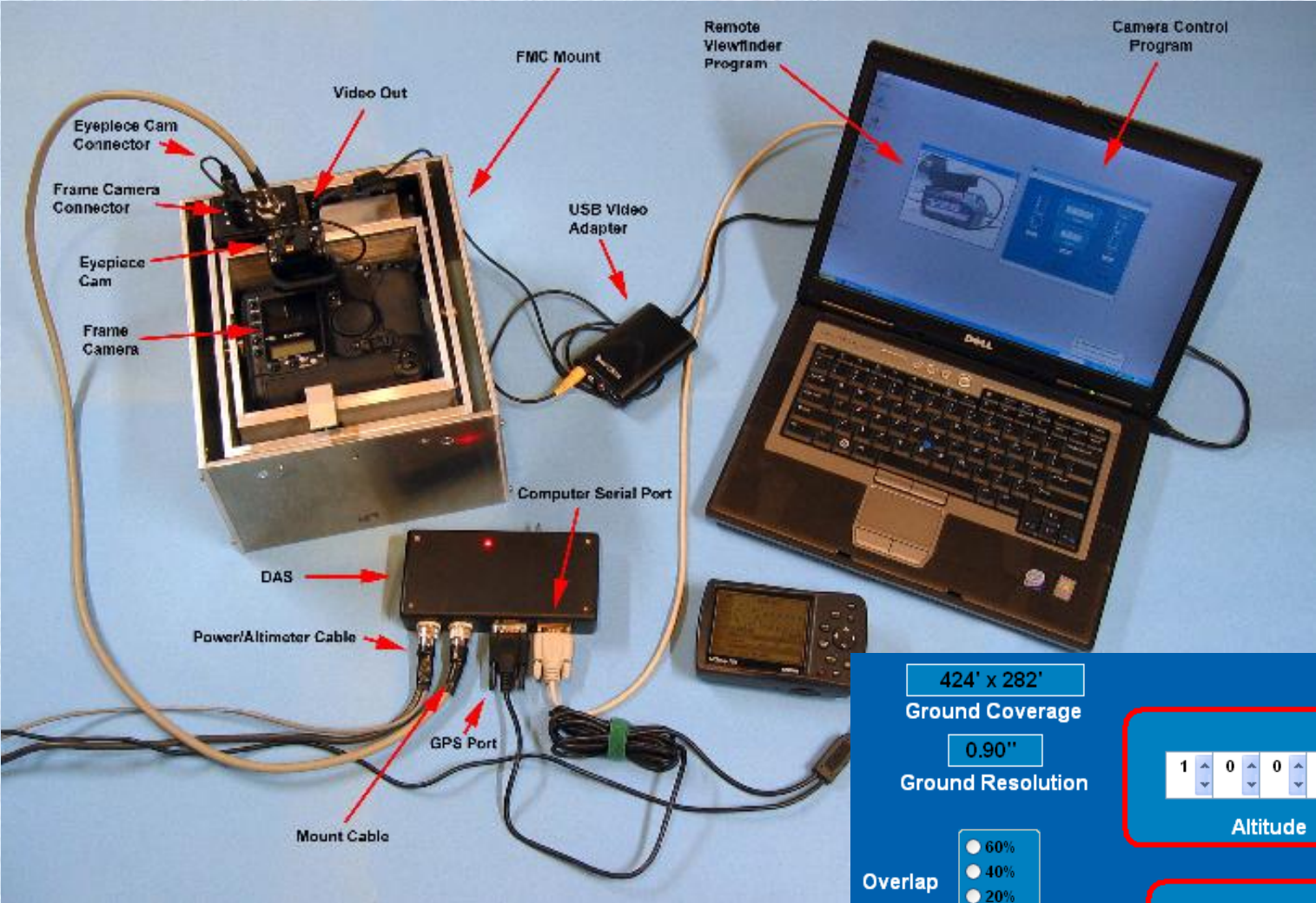




Cessna Skymaster O-2 Observer and Camera Viewfields







424' x 282'

Ground Coverage

0.90"

Ground Resolution

60%

40%

20%

None

Overlap

85mm

Lens

8992

Frame

On

Off

Warnings

Auto (F5)

Off (F5)

Operate

Altitude

1 0 0 0

Speed

1 0 7

Comment (F4)

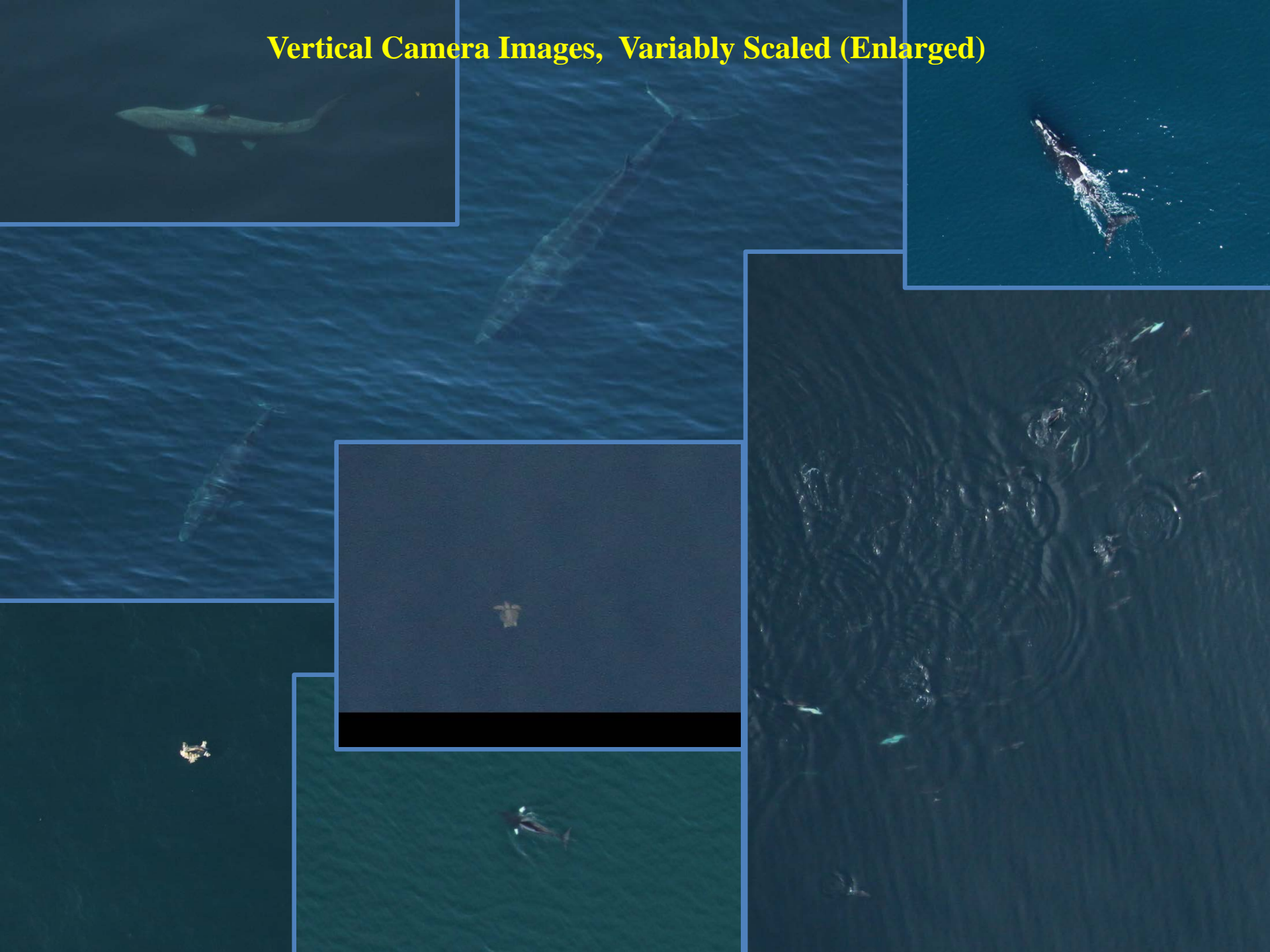
\$CCU,1,499,1

Using Com1 at 19200,n,8,1 in NMEA mode

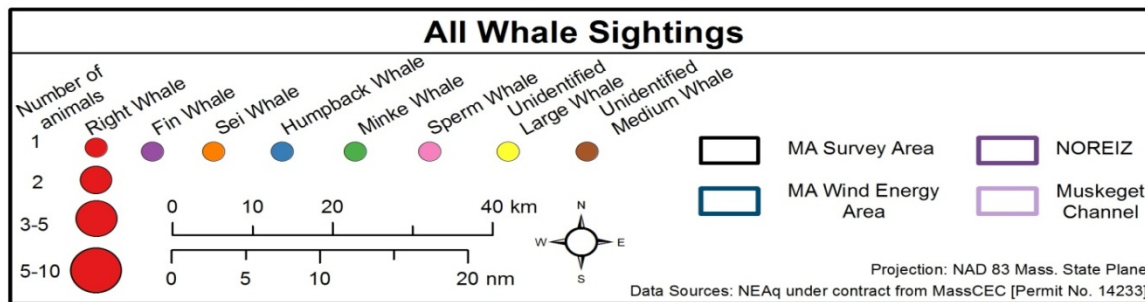
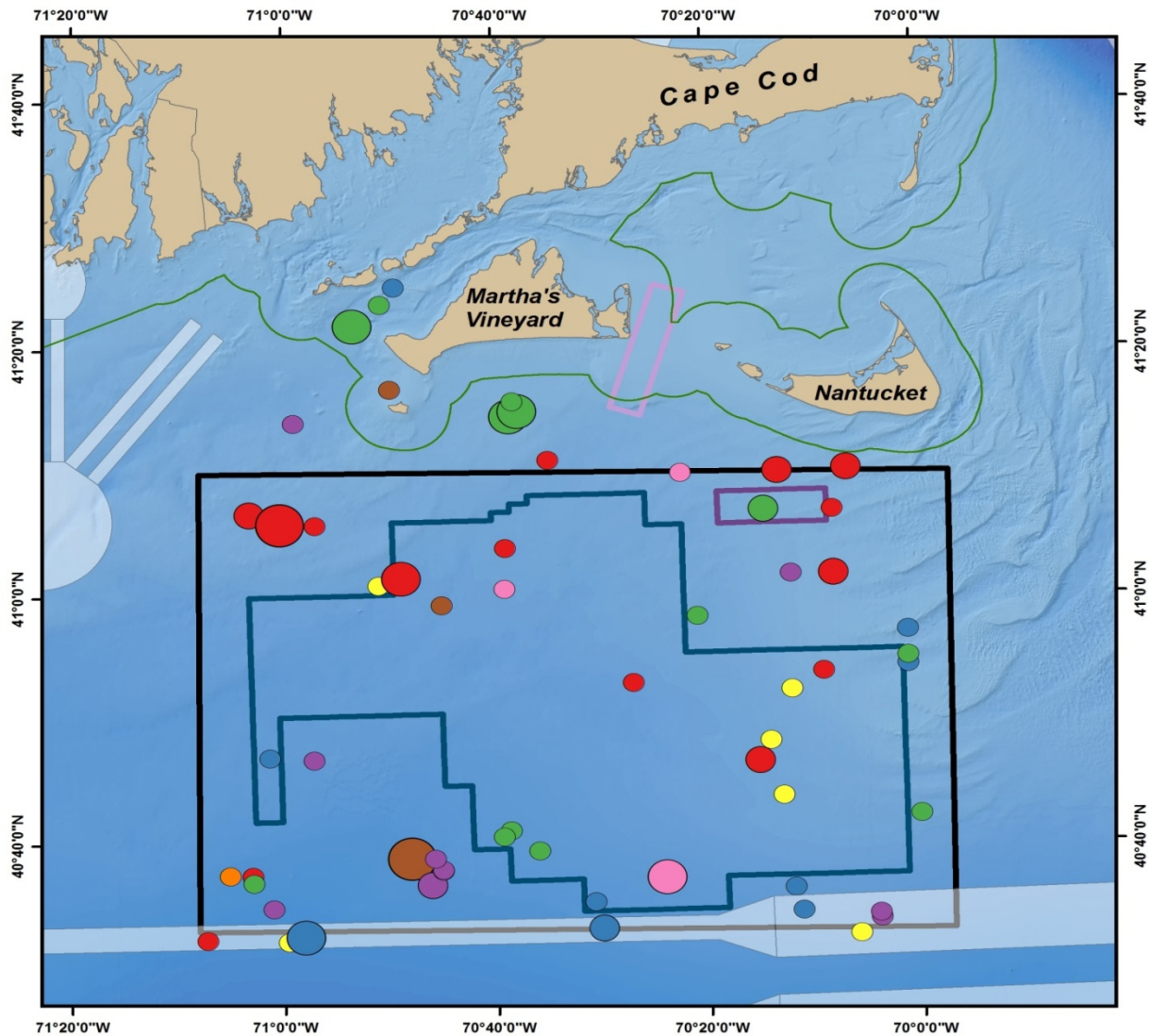
Trip (F9)

Lat: **N41°54.673'** Long: **W070°43.840**MSL Altitude:
 Local: **16:42:10** Mode: **No GPS** GPS Course:
 Events: **0** Sightings: **0** (?) **0** (S) **0**

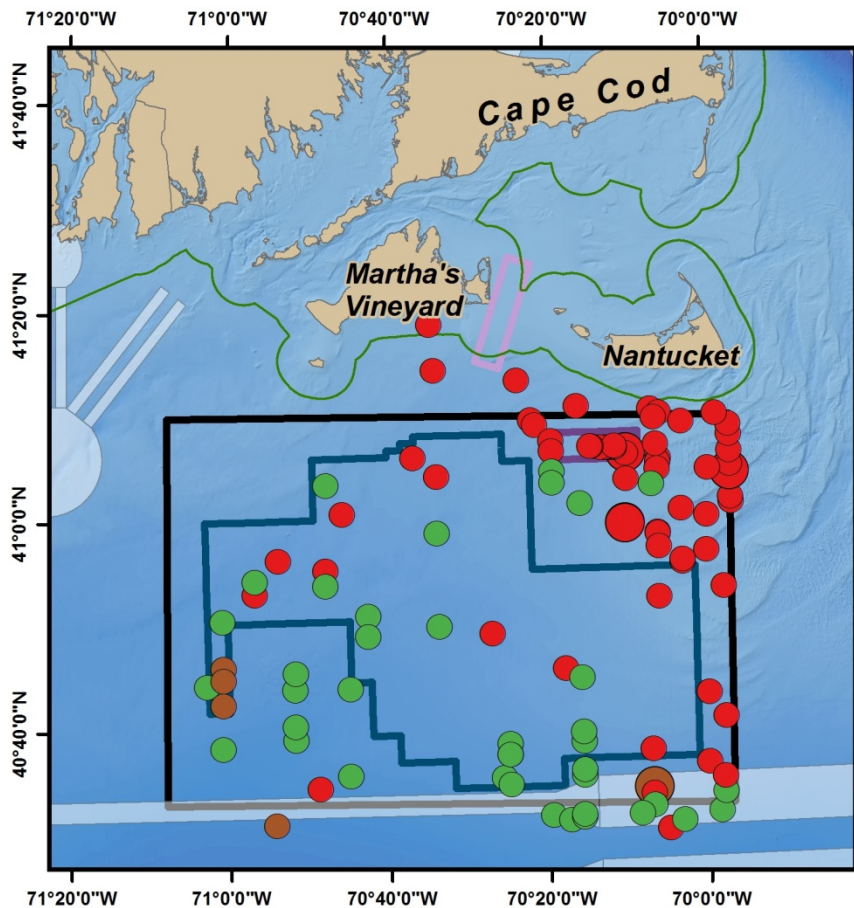
Vertical Camera Images, Variably Scaled (Enlarged)



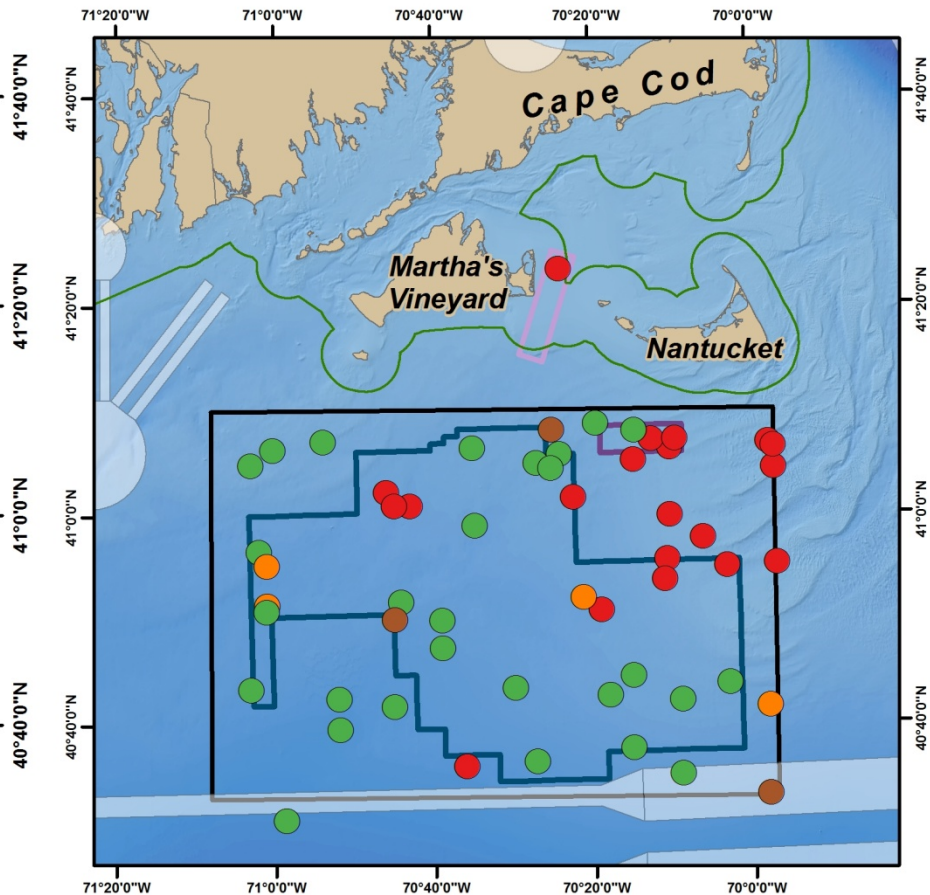




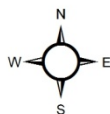
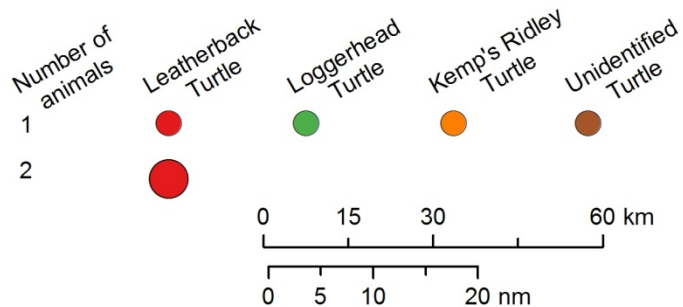
Observer Sightings



Vertical Camera Sightings



All Sea Turtle Sightings



MA Survey Area



MA Wind Energy Area



NOREIZ

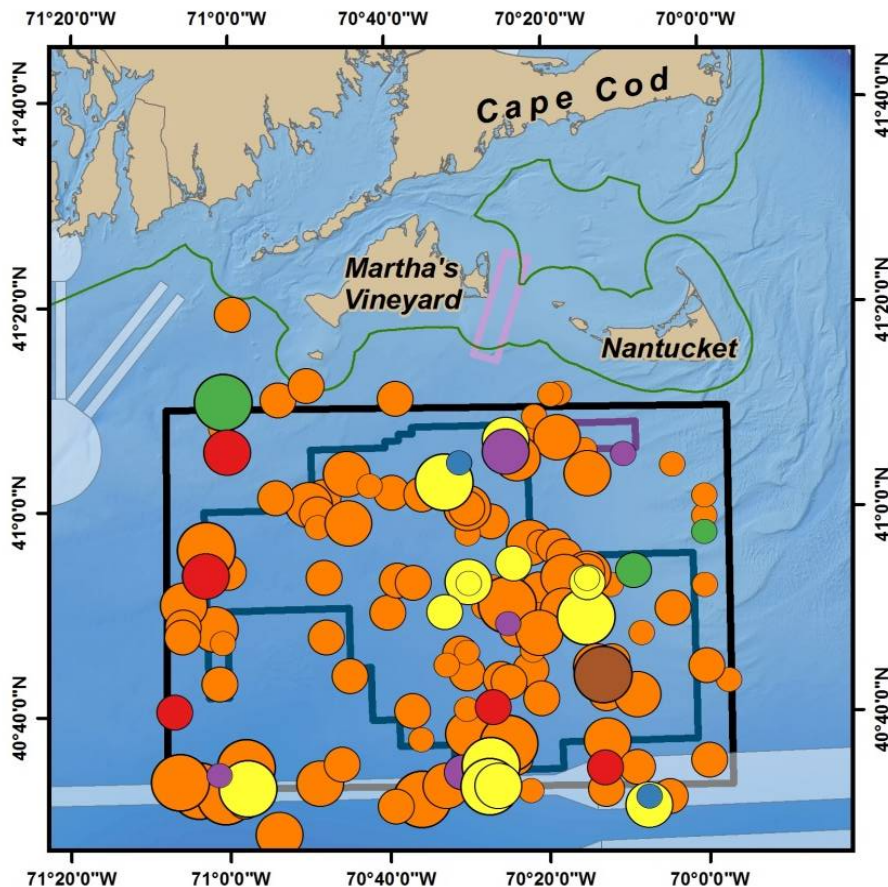


Muskeget Channel

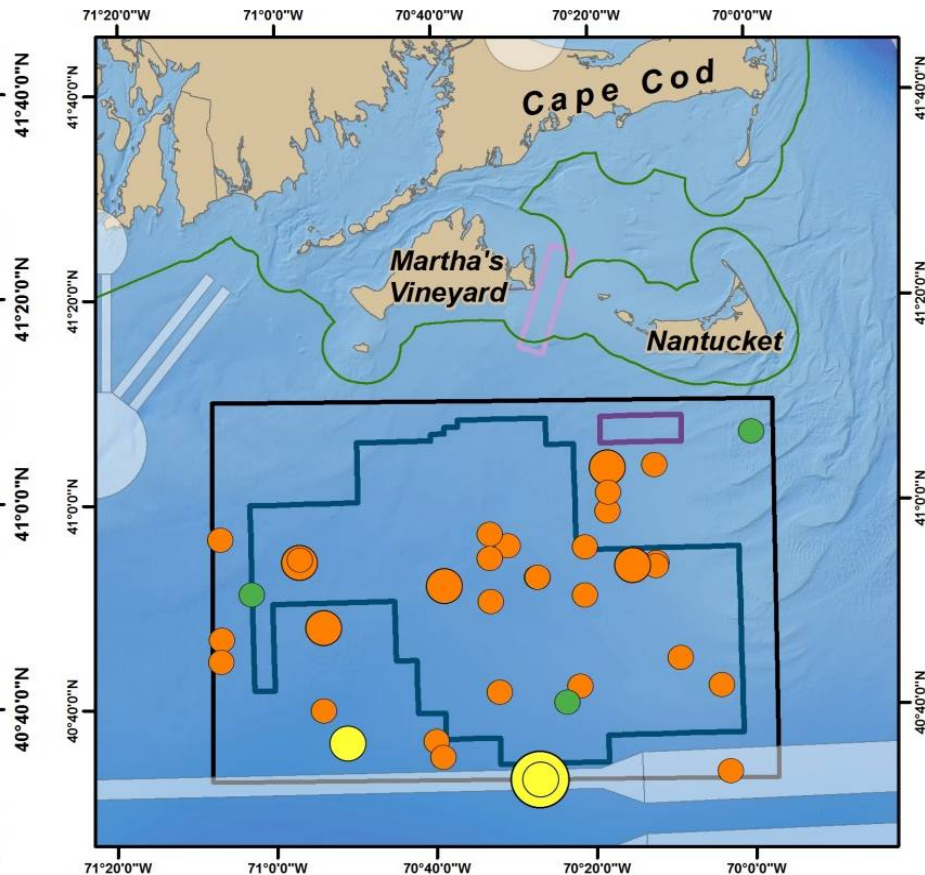
Projection: NAD 83 Mass. State Plane

Data Sources: NEAq under contract from MassCEC [Permit No. 14233]

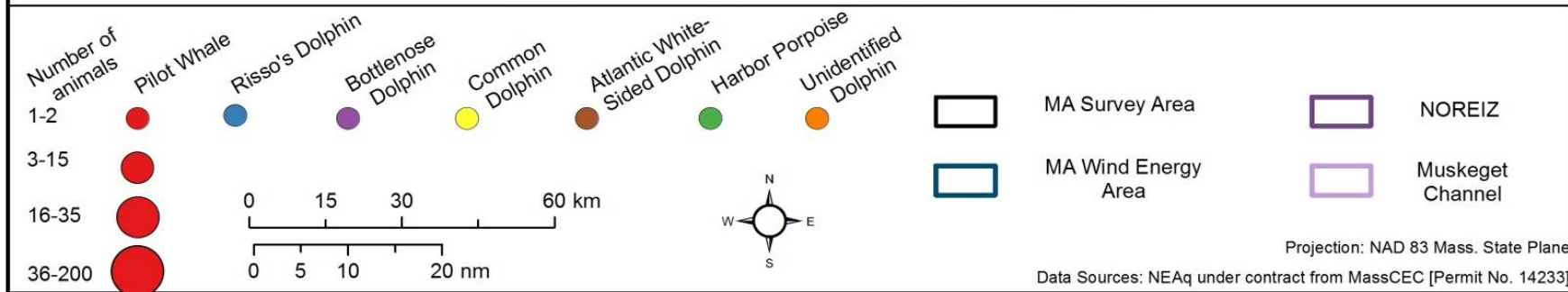
Observer Sightings



Vertical Camera Sightings

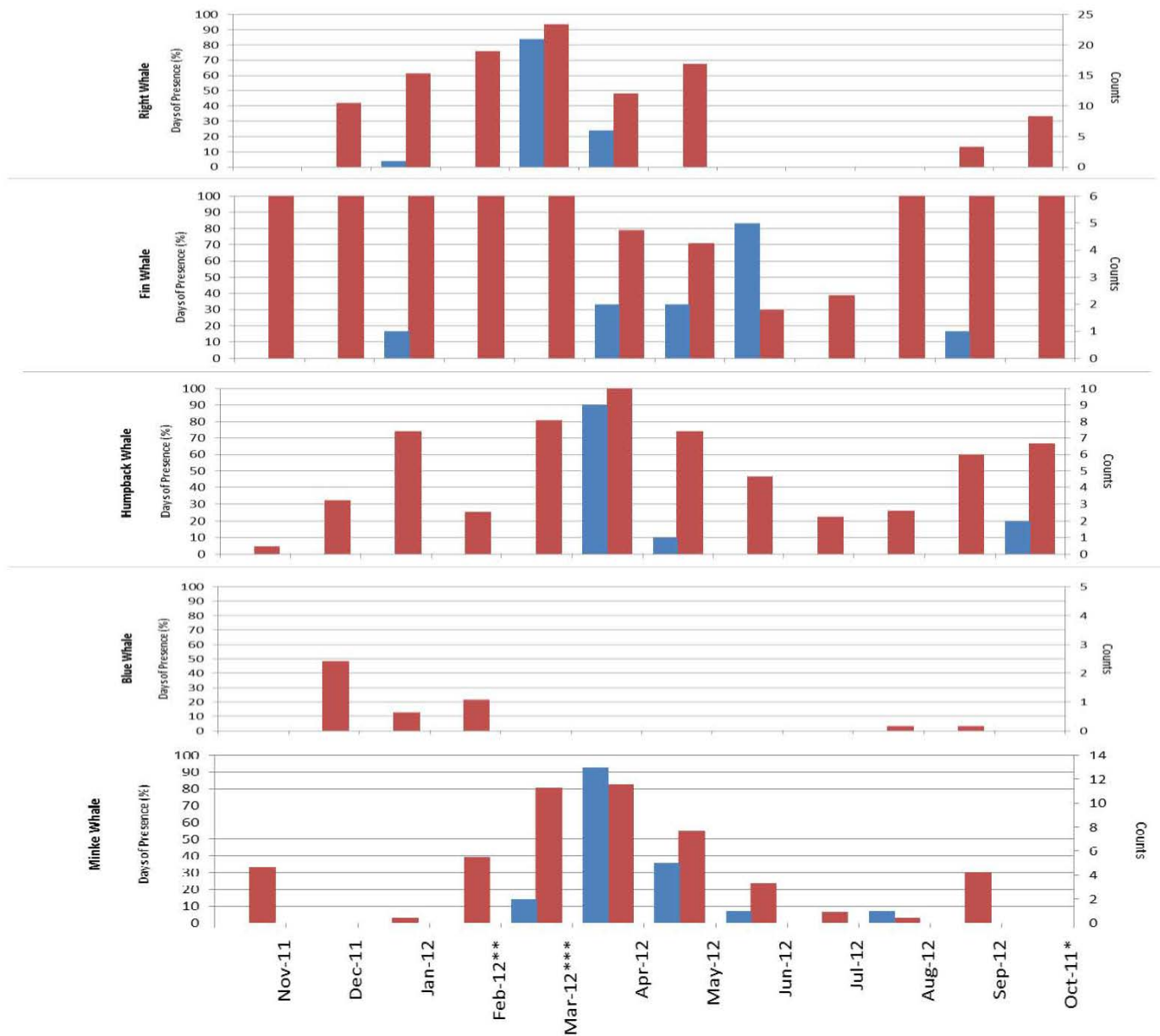


All Delphinids and Harbor Porpoise Sightings



- Percentage of days in each month that vocalizations were detected
- Number of individuals sighted by aerial surveys

Acoustic and Aerial Sightings Data



year	Fin	Humpback	Leatherback	Loggerhead	Minke	Ridley	Right
2012	11	12	99	77	22	6	28
2013	32	61	30	3	20	0	30
SD	14.85	34.65	48.79	52.33	1.41	4.24	1.41
CV%	69.07	94.93	75.64	130.81	6.73	141.42	4.88