

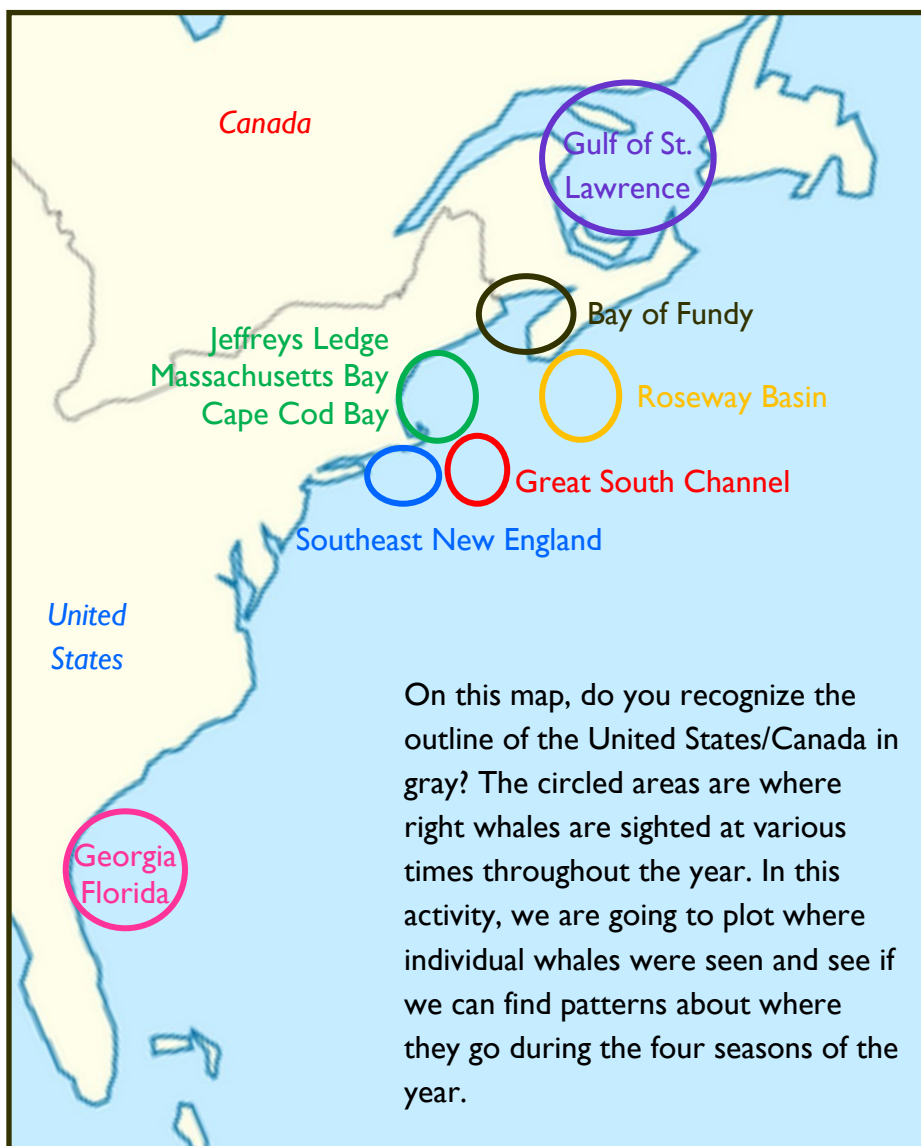


Right Whale Migration:

Where Do Those Females Go?

In this lesson, we are going to map the sightings of four female right whales to see what we can learn about their distribution at different times of the year. The four females are Halo, Mayport, Calvin and Bocce.

Scientists have been studying right whales since the 1980's. Over that time, they have identified a few consistent locations where these animals tend to congregate. The map below labels those locations for you.



On this map, do you recognize the outline of the United States/Canada in gray? The circled areas are where right whales are sighted at various times throughout the year. In this activity, we are going to plot where individual whales were seen and see if we can find patterns about where they go during the four seasons of the year.



Put on Your Designing Cap:

Before you begin the activity, can you describe two ways scientists might be able to observe right whales or how they figure out where right whales might be seen?



ACTIVITY 2: Where Do Those Females Go?

Focus question: Where do you think right whales might be sighted in the winter, spring, summer and fall? (To answer this question, think about what you might know about whales, but also other animals like birds and butterflies.)

Winter: _____

Spring: _____

Summer: _____

Fall: _____

This activity is going to “draw” on your graphing skills. You are going to graph where these four females (Bocce, Mayport, Halo and Calvin) have been sighted. The sighting data is from the [Right Whale Catalog](#) that is maintained by the Anderson Cabot Center for Ocean Life at the New England Aquarium. We have taken one sighting per location per year and put it in a table for you to graph. Therefore, these data do not represent all sightings of these whales over their lifetime.

Directions:

1. Print out the pages of the whales that you want to graph. (These are found on the next 5 pages).
2. For each data point, place a colored dot in the corresponding location of the graph. For example, the first row of Halo’s data is

12 (Pink)	2004	South Carolina	B4
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 That means that in December of 2004, Halo was sighted off South Carolina. Place a pink dot in block B4. (It should be relatively small). Continue until all the locations are represented on the map. Make sure you use the different colors to represent the different seasons:

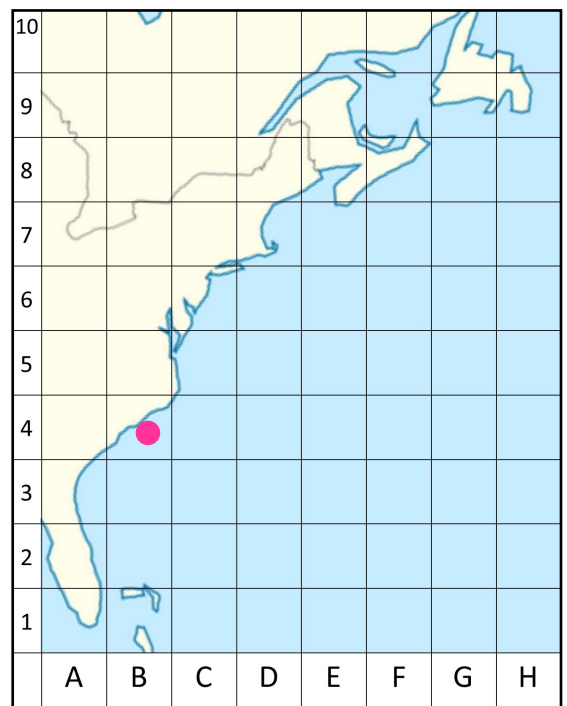
Pink is winter (Dec, Jan, and Feb)

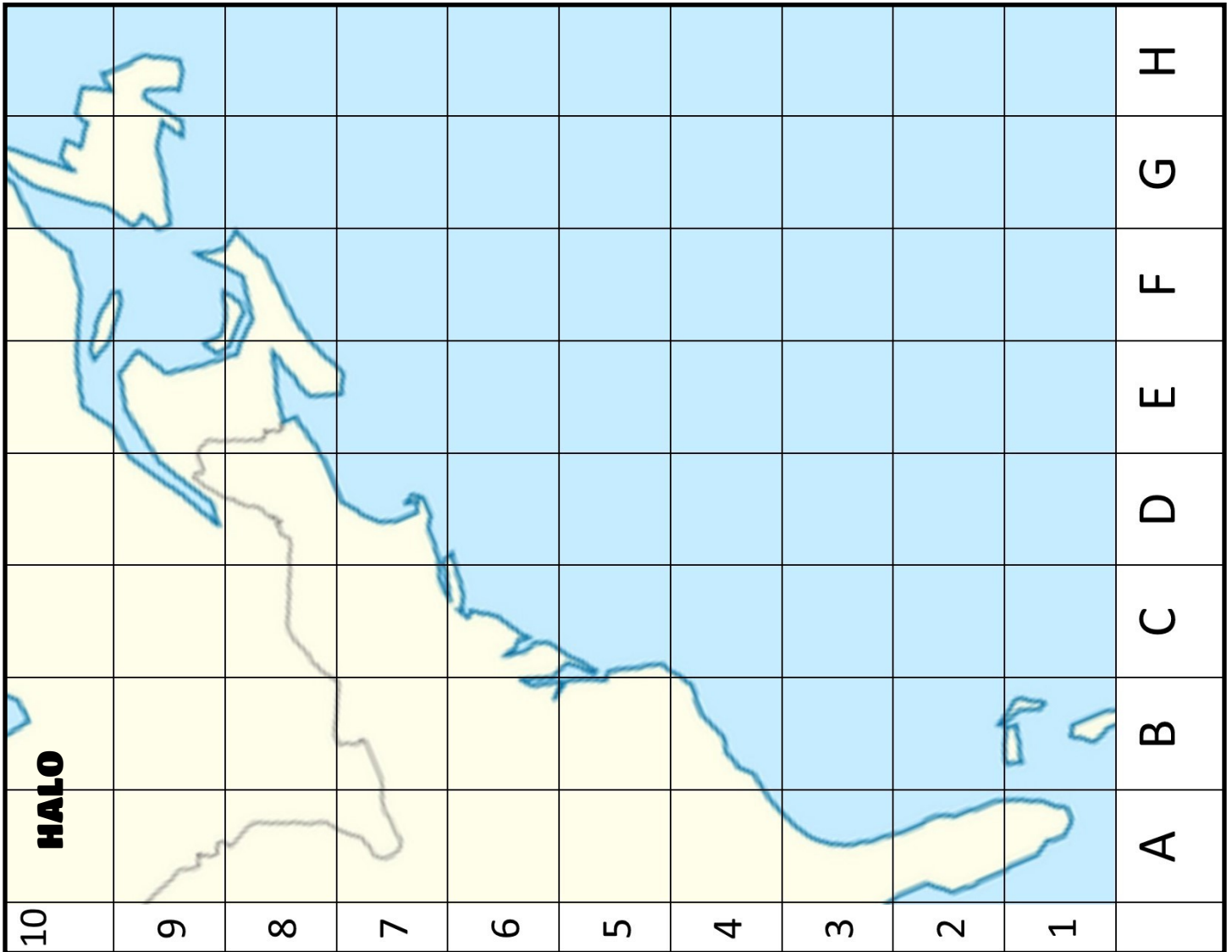
Yellow is spring (Mar, Apr, May)

Green is summer (Jun, Jul, Aug)

Blue is fall (Sep, Oct, Nov)

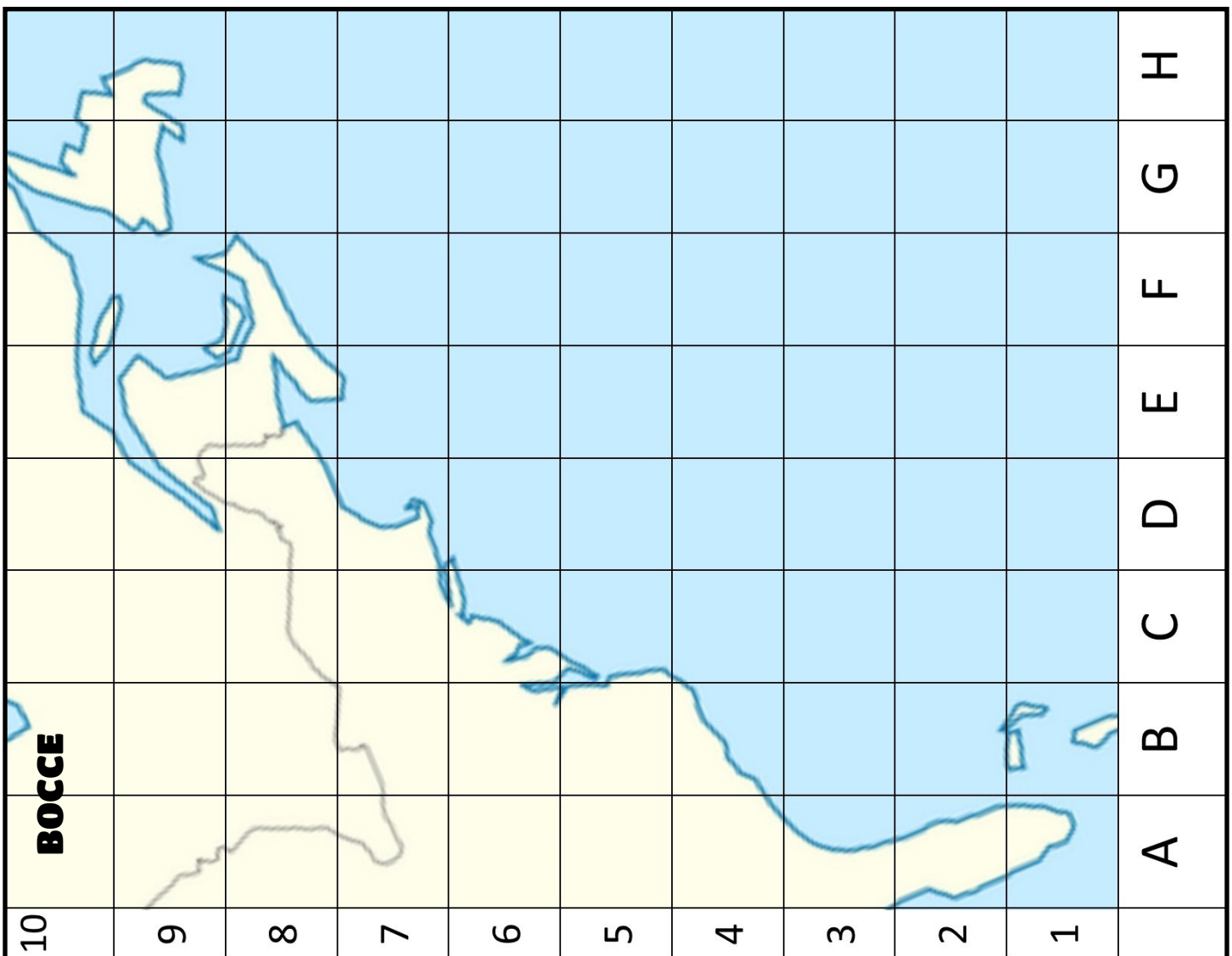
3. Calvin has sightings over a longer period of time than Halo, Mayport and Bocce because she is older than the others. Make sure you make your dots small so that you can fit them all into the little spaces! We suggest using just the tip of a marker.
4. When you are finished, answer the questions after the maps!

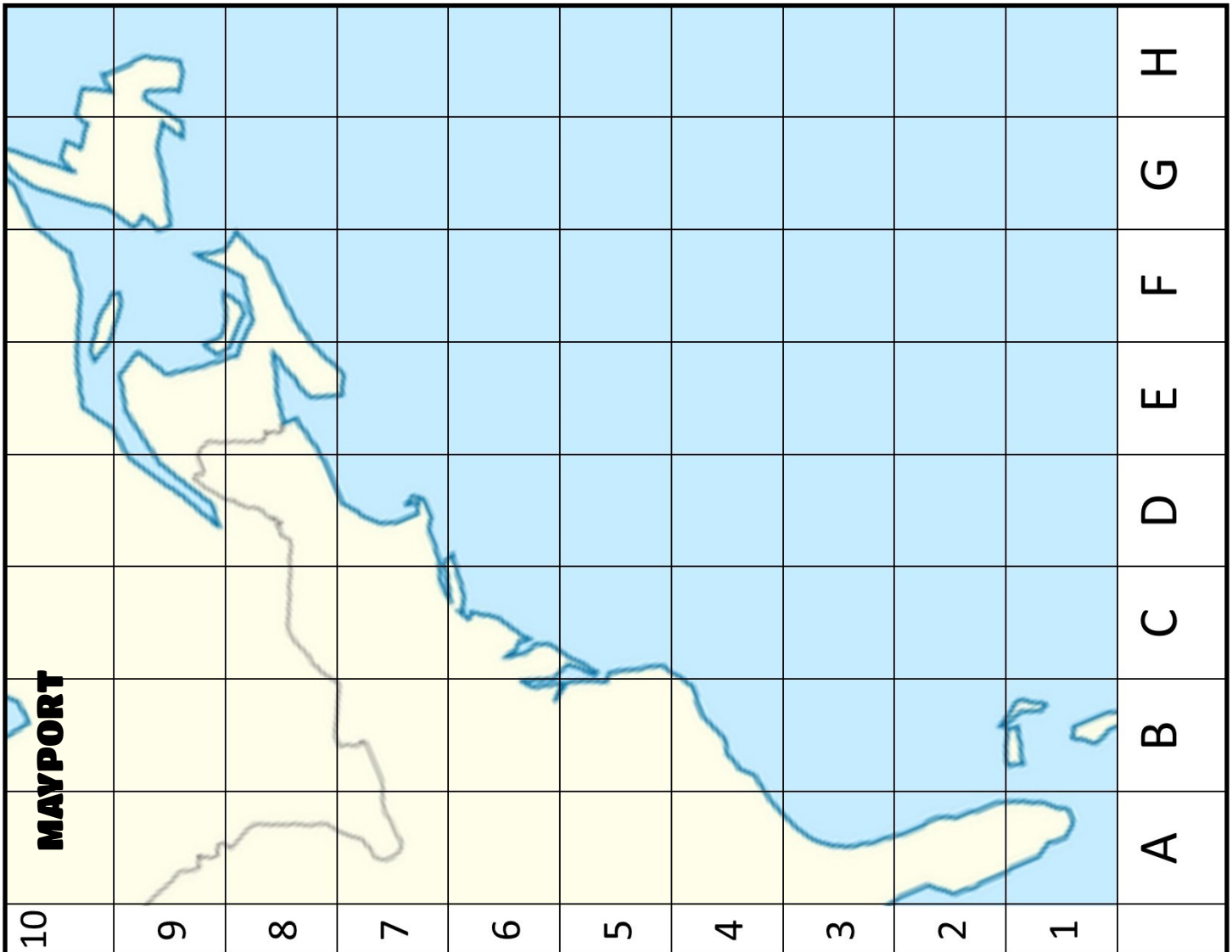




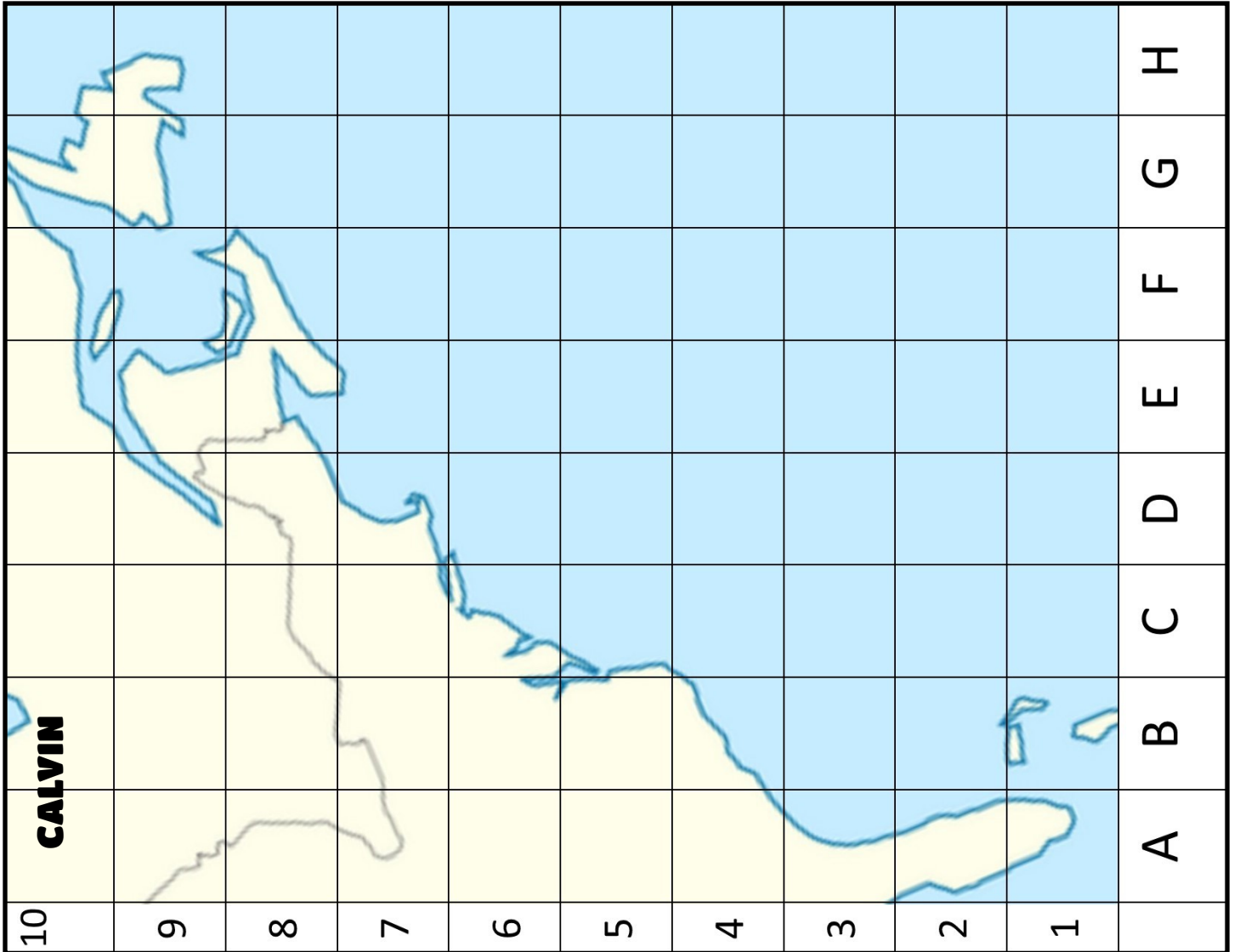
Sighting Month	Sighting Year	Halo Sighting Area	Graph Location
12 (Pink)	2004	South Carolina	B4
1 (Pink)	2005	Georgia	A3
5 (Yellow)	2006	Cape Cod Bay	D7
2 (Pink)	2007	Florida	A3
3 (Yellow)	2007	Cape Cod Bay	D7
4 (Yellow)	2007	Great South Channel	E6
8 (Green)	2007	Bay of Fundy	E8
2 (Pink)	2008	Florida	A3
4 (Yellow)	2008	Cape Cod Bay	D7
1 (Pink)	2009	Florida	A3
3 (Yellow)	2009	Cape Cod Bay	D7
1 (Pink)	2010	Florida	A3
12 (Pink)	2010	Gulf of Maine	E7
4 (Yellow)	2010	Southern New England	D6
5 (Yellow)	2010	Great South Channel	E6
1 (Pink)	2011	Florida	A3
4 (Yellow)	2011	Southern New England	D6
5 (Yellow)	2012	Roseway Basin	F7
3 (Yellow)	2013	Cape Cod Bay	D7
4 (Yellow)	2013	Great South Channel	E6
1 (Pink)	2014	Florida	A3
6 (Green)	2014	Gulf of St. Lawrence	F9
4 (Yellow)	2016	Cape Cod Bay	D7
5 (Yellow)	2016	Great South Channel	E6
5 (Yellow)	2017	Southern New England	D6
7 (Green)	2017	Gulf of St. Lawrence	F9
1 (Pink)	2018	Georgia	A3
12 (Pink)	2018	Southern New England	D6
2 (Pink)	2018	Cape Cod Bay	D7
7 (Green)	2018	Gulf of St. Lawrence	F9

Sighting Month	Sighting Year	Bocce Sighting Area	Graph Location
2 (Pink)	2008	Florida	A3
2 (Pink)	2009	Florida	A3
5 (Yellow)	2009	Great South Channel	E6
1 (Pink)	2010	Florida	A3
3 (Yellow)	2010	Cape Cod Bay	D7
1 (Pink)	2011	Florida	A3
4 (Yellow)	2011	Cape Cod Bay	D7
8 (Green)	2011	Bay of Fundy	E8
1 (Pink)	2012	Cape Cod Bay	D7
1 (Pink)	2013	Florida	A3
11 (Blue)	2013	Gulf of St. Lawrence	F9
3 (Yellow)	2013	Cape Cod Bay	D7
1 (Pink)	2014	Florida	A3
3 (Yellow)	2014	Cape Cod Bay	D7
2 (Pink)	2015	Cape Cod Bay	D7
6 (Green)	2015	Gulf of St. Lawrence	F9
1 (Pink)	2016	Florida	A3
4 (Yellow)	2016	Cape Cod Bay	D7
5 (Yellow)	2016	Great South Channel	E6
8 (Green)	2016	Gulf of St. Lawrence	F9
3 (Yellow)	2017	Cape Cod Bay	D7
5 (Yellow)	2017	Great South Channel	E6
6 (Green)	2017	Gulf of St. Lawrence	F9
3 (Yellow)	2018	Cape Cod Bay	D7
7 (Green)	2018	Gulf of St. Lawrence	F9





Sighting Month	Sighting Year	Mayport Sighting Area	Graph Location
12 (Pink)	2009	Florida	A3
1 (Pink)	2010	Florida	A3
3 (Yellow)	2010	South Carolina	B4
4 (Yellow)	2010	Cape Cod Bay	D7
1 (Pink)	2011	Florida	A3
12 (Pink)	2012	Florida	A3
1 (Pink)	2013	Florida	A3
1 (Pink)	2014	Florida	A3
4 (Yellow)	2014	Great South Channel	E6
4 (Yellow)	2014	Cape Cod Bay	D7
4 (Yellow)	2014	Cape Cod Bay	D7
5 (Yellow)	2014	Great South Channel	E6
1 (Pink)	2016	Florida	A3
5 (Yellow)	2016	Great South Channel	E6
7 (Green)	2016	Gulf of St. Lawrence	F9
4 (Yellow)	2017	Southern New England	D6
7 (Green)	2017	Gulf of St. Lawrence	F9



Sighting data for Calvin is
on the next page

Sighting Month	Year	Calvin_Sighting Area	Graph Location
8 (Green)	1992	Bay of Fundy	E8
7 (Green)	1993	Bay of Fundy	E8
8 (Green)	1994	Bay of Fundy	E8
9 (Blue)	1995	Bay of Fundy	E8
8 (Green)	1996	Bay of Fundy	E8
8 (Green)	1997	Bay of Fundy	E8
3 (Yellow)	1998	Cape Cod Bay	D7
8 (Green)	1998	Bay of Fundy	E8
12 (Pink)	1999	Florida	A3
4 (Yellow)	1999	Cape Cod Bay	D7
5 (Yellow)	1999	Great South Channel	E6
6 (Green)	1999	Bay of Fundy	E8
3 (Yellow)	2000	Cape Cod Bay	D7
7 (Green)	2000	Bay of Fundy	E8
2 (Pink)	2001	Cape Cod Bay	D7
3 (Yellow)	2001	Great South Channel	E6
6 (Green)	2001	Great South Channel	E6
3 (Yellow)	2002	Great South Channel	E6
4 (Yellow)	2002	Massachusetts Bay	D7
4 (Yellow)	2003	Great South Channel	E6
4 (Yellow)	2003	Cape Cod Bay	D7
12 (Pink)	2004	North Carolina	B4
3 (Yellow)	2004	Cape Cod Bay	D7
5 (Yellow)	2004	Great South Channel	E6
8 (Green)	2004	Great South Channel	E6
1 (Pink)	2005	Georgia	A3
3 (Yellow)	2005	Cape Cod Bay	D7
8 (Green)	2005	Bay of Fundy	E8
2 (Pink)	2006	Cape Cod Bay	D7

Sighting Month	Year	Calvin_Sighting Area	Graph Location
8 (Green)	2006	Roseway Basin	F7
2 (Pink)	2007	Cape Cod Bay	D7
5 (Yellow)	2007	Great South Channel	E6
12 (Pink)	2008	North Carolina	B4
4 (Yellow)	2008	Great South Channel	E6
9 (Blue)	2008	Bay of Fundy	E8
6 (Green)	2009	Great South Channel	E6
8 (Green)	2009	Bay of Fundy	E8
3 (Yellow)	2010	Cape Cod Bay	D7
4 (Yellow)	2010	Great South Channel	E6
2 (Pink)	2011	Cape Cod Bay	D7
9 (Blue)	2011	Bay of Fundy	E8
3 (Yellow)	2012	Southern New England	D6
4 (Yellow)	2012	Massachusetts Bay	D7
5 (Yellow)	2012	Great South Channel	E6
4 (Yellow)	2013	Cape Cod Bay	D7
4 (Yellow)	2013	Great South Channel	E6
5 (Yellow)	2014	Great South Channel	E6
8 (Green)	2014	Gulf of St. Lawrence	F9
3 (Yellow)	2015	Florida	A3
4 (Yellow)	2015	South Carolina	B4
8 (Green)	2015	Gulf of St. Lawrence	F9
9 (Blue)	2015	Roseway Basin	F7
9 (Blue)	2015	Bay of Fundy	E8
4 (Yellow)	2016	Cape Cod Bay	D7
4 (Yellow)	2017	Cape Cod Bay	D7
7 (Green)	2017	Gulf of St. Lawrence	F9
4 (Yellow)	2018	Massachusetts Bay	D7
6 (Green)	2018	Gulf of St. Lawrence	F9



Extend the Learning

What Did You Observe?

Where Do These Females Go?

Place all four maps in front of you. List the locations that the whales are sighted in each month.

1. Winter: _____
2. Spring: _____
3. Summer: _____
4. Fall: _____

What are some interesting observations that you made? _____

Describe any patterns that stand out for you. _____

Are there any holes in the research? Describe where the holes are or times of year that we need more information? Design a project to help scientists figure out where whales are sighted during those times of the year. _____



Extend the Learning (cont.)

What Did You Observe? Where Do These Females Go?

What do you think it would look like if we graphed four males? How and why might they be the same or different? (Activity 3 focuses on this.) _____

Do you think we can say that all females in the population go to these locations? Why or why not? _____

Why might it be important for us to know where right whales are at different times of the year? _____

Describe conservation efforts that could come about from knowing where whales are sighted throughout the year. _____

If you have completed this and would like feedback, please send it in to info@yearoftherightwhale.org and put "Activity 2" in the subject line.