

## **North Atlantic Right Whale Catalog update and whale naming results**

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Each year the New England Aquarium provides an update of the status of the photo-identification Catalog which they manage for the Consortium. This update will include: the number of animals currently in the Catalog, their age and sex and whether they are presumed alive or dead; the number of sightings and images contributed in the last year; new animals added to the Catalog; the matching status of the data by year; and an overview of recent births, mortalities and entanglements (although details of the latter two will likely be provided by other presenters). Also, comparisons of data submission and number of whales alive historically will be presented. To ensure that the most up-to-date data are provided, these numbers will be calculated in mid-October and therefore the results are not provided in this abstract. Given the large number of researchers that utilize the Catalog data, it is important to provide annual summaries of the status of available data so that these researchers can determine appropriate research objectives. Lastly, the final results of the Consortium whale naming effort will be presented.

## North Atlantic Right Whale Catalog Update and Whale Naming Results

### Explanation of content

#### SLIDE 3:

##### A sighting can be:

- A single whale or many dozens of whales (though multiple whales are broken down into individual sighting records when entered)
- a single image or thousands of images (UAVs)
- from land, boat or aircraft
- Directly contributed or from Whale Alert, Email, Facebook, YouTube, Twitter
- a series of still images (of various quality) to long video (of various quality)
- live or dead whale

##### Enter a sighting

- Use custom built software named DIGITS to process data
- Date, time, location, observer etc. Easy when survey data, harder to get this basic information from social media or from dead or entangled whales. People don't always have access to GPS location

##### Assign images

- Drag and drop- straight forward. Time consuming with SAGs- which body part goes with which head
- Delete excess images- keep anything that shows behaviors, scars, subtle matching features like callosity along the mandible. Not keeping the pretty ones- keeping the ones that hold all the information. Images are the proof of everything we know in the Catalog. That's why we want all of them

##### Code images

- Code for body part and view direction. Allows us to Search for ID, and filter images by body part and direction to assess health and scars. See just right flippers rather than thousands of images of a whale. Also really helpful in identifying dead whales floating belly up! Nearly 1 million image codings

##### Sighting coded

- Note sex and matching features for identification

##### Behavior and association

- Entangled, dead, mud, w/calf, gear-free, feeding etc.

##### Identify the individual

- Exciting AI advancement- will help speed up matching many aerial to aerial, maybe shipboard to shipboard, Doesn't work well with poor quality images (underwater, dark, etc). Unlikely AI will be able to match aerial to shipboard and vice versa.
- What we use to match: Callosity pattern -both sides of the head, ridges along the top of the lower lip, callosities behind the blowholes and along the jaw line, scars anywhere- often on the tail stock and flukes, head shape. Again, because we use so many marks all over the body, we need all the images to be submitted- not just a few of the head.

### Confirm

- A second person confirms the ID and that every image belongs to that whale. Did the person assigning the images do it correctly? Particularly tricky in large SAGs

Presumed dead means a whale was not seen in six years. We know that, on average, 35 whales presumed alive in any given year are likely already dead

Resurrected- seen after a six or more year gap

# North Atlantic Right Whale Catalog Update and Whale Naming Results

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New England Aquarium

# What is the Catalog

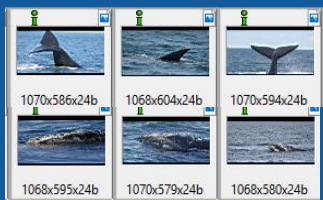
Nearly 80,000 sightings (1935 to present)

746 whales cataloged

Over 1 million images

Sighting: someone photographs a right whale

Wow- this blurry image shows a new scar!



Sighting entered

Images assigned to sighting!

Images coded for body part/view direction

# The life of a sighting

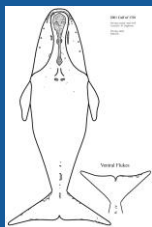
Confirm identification

Identify the individual

Behavior & associations coded

Code for callosity and other matching features

Composite created or updated



New whales cataloged

Batch sightings and inspect images for health

Batch sightings and inspect images for human-caused scars

# Catalog Break Down

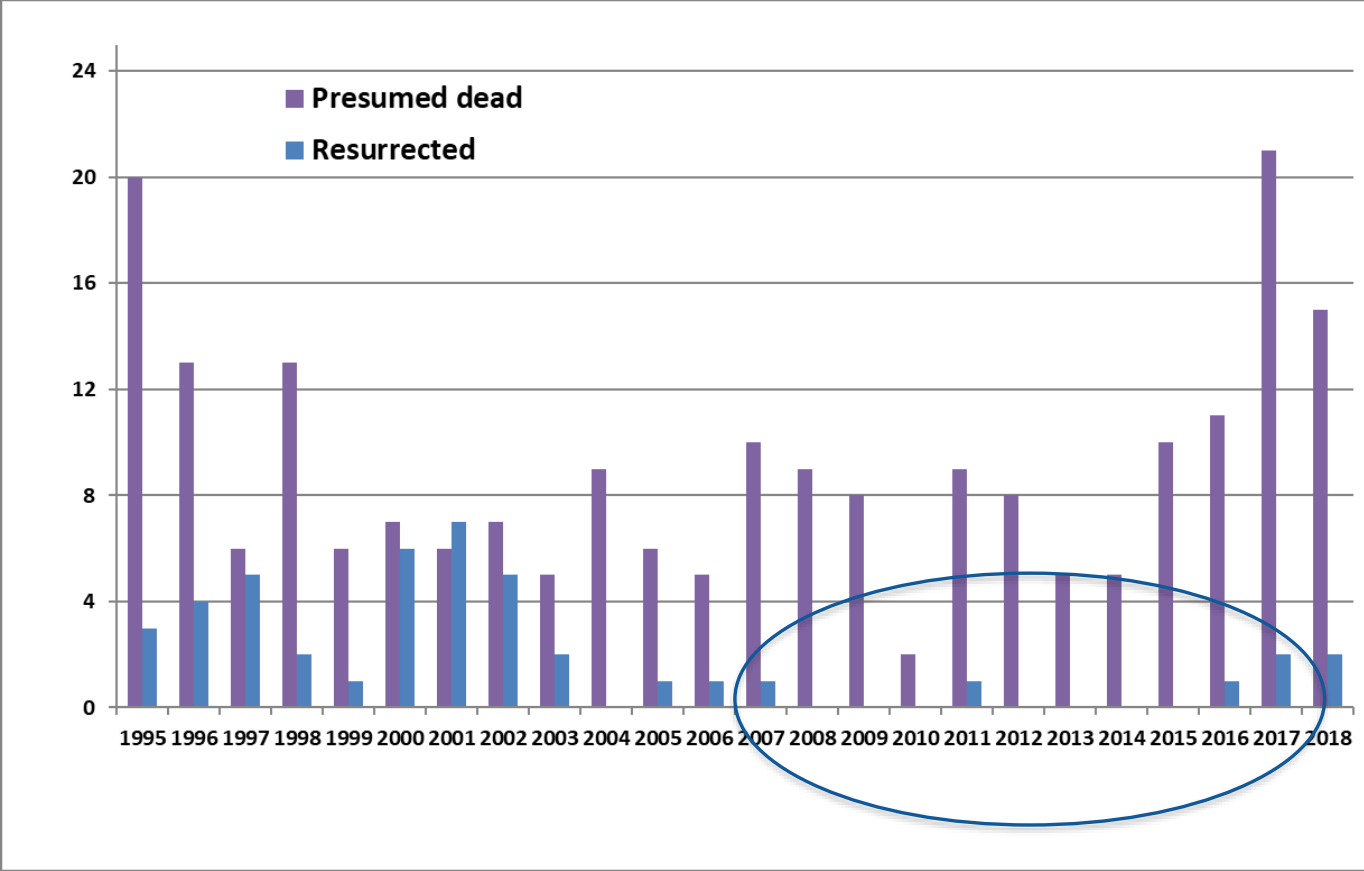
## All Cataloged Whales

Female	313	← 46.7% of known sex
Male	357	
Unknown sex	76	
<b>Totals</b>	<b>746</b>	

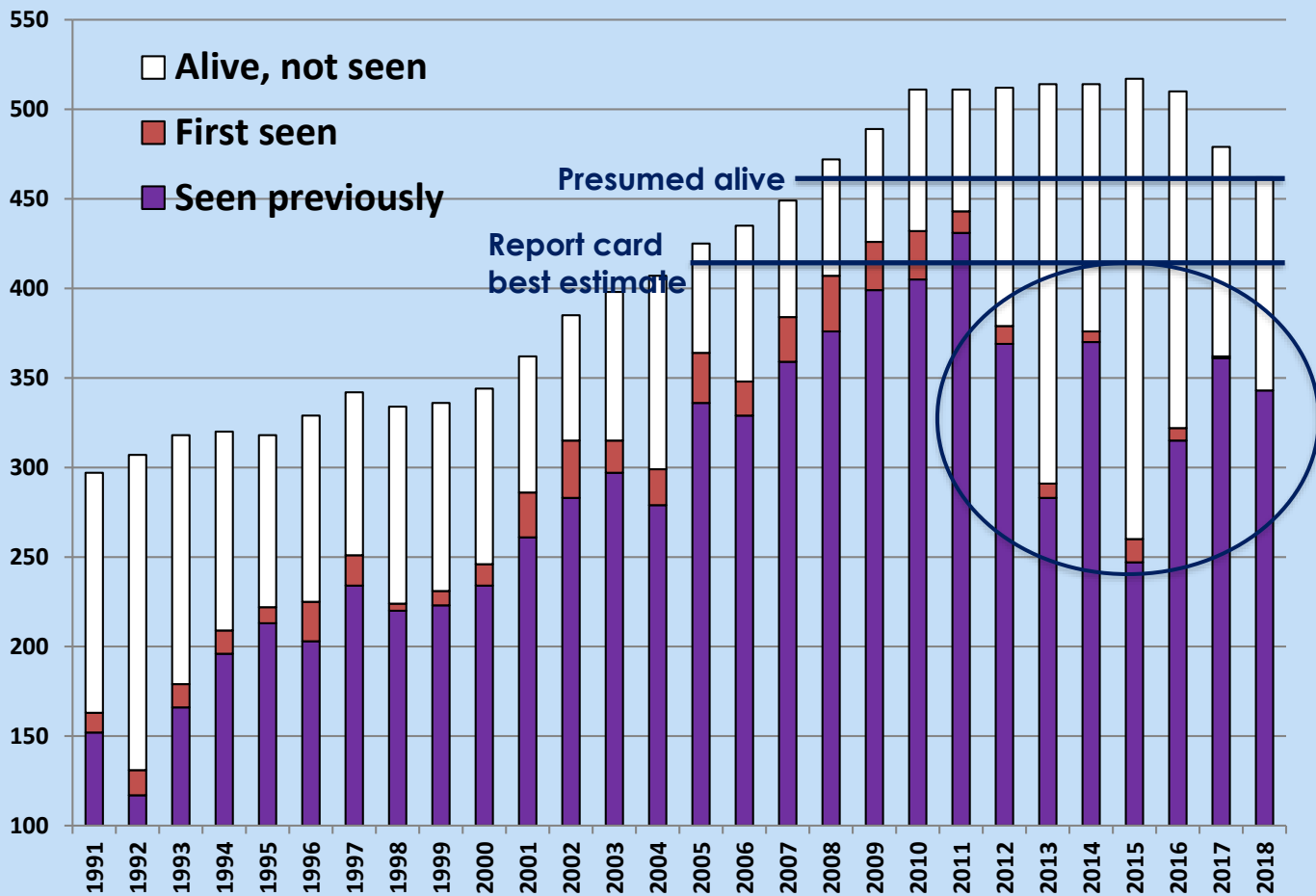
## Whales Presumed Alive in 2018

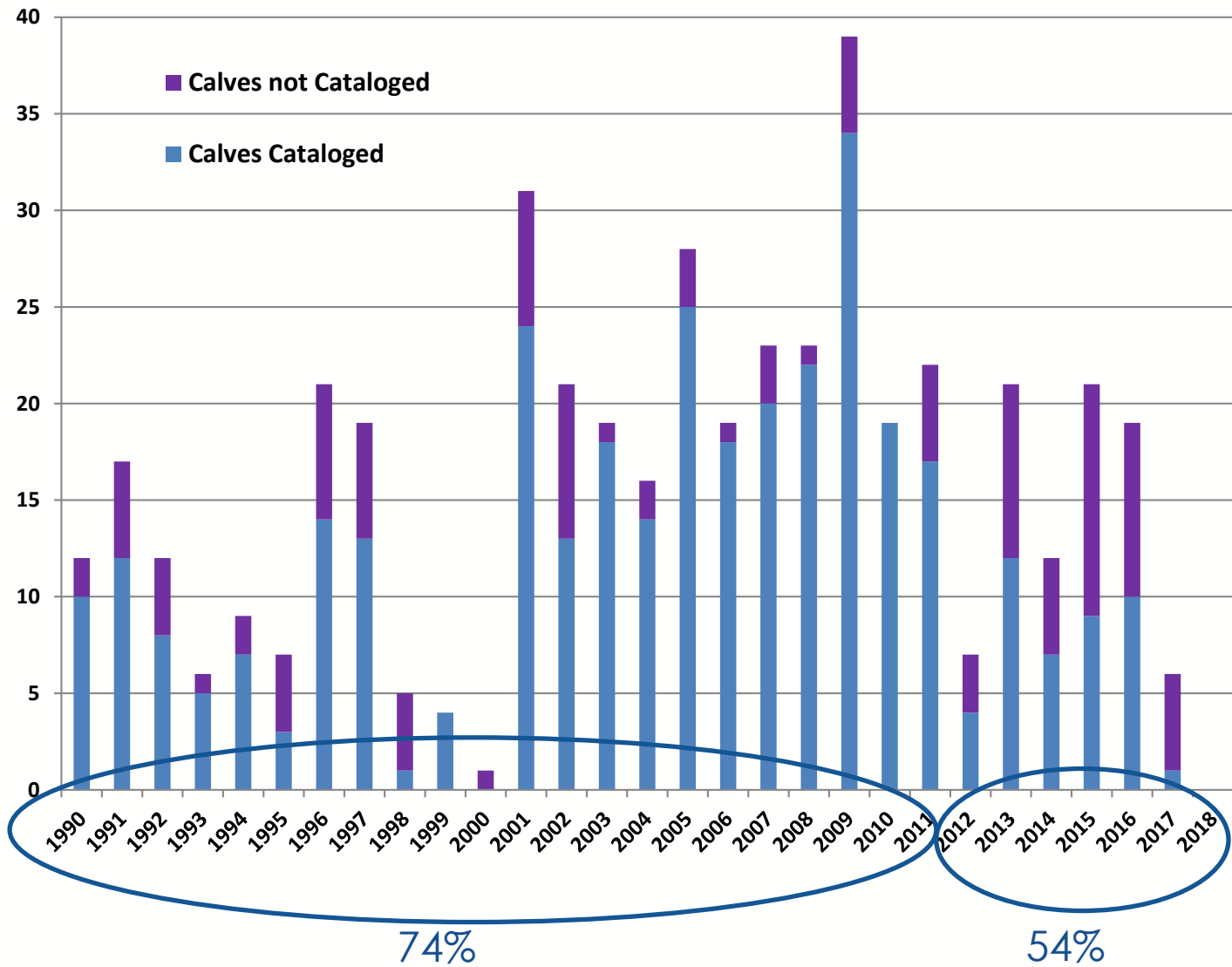
	Adult	Juvenile	Unknown	
Female	145	29	2	176 ← 40.2% of known sex
Male	227	35	0	262
Unknown sex	17	4	3	24
<b>Totals</b>	<b>389</b>	<b>68</b>	<b>5</b>	<b>462</b>
				62 Known dead by the end of 2018
				222 Presumed dead
				<b>746 Total in Catalog</b>

# Presumed Deaths and Resurrections: 1995 to 2018









# Changes to the Catalog since last Consortium meeting

- 3,618 sightings added
- 2,635 identifications confirmed
- 12 new whales cataloged
- 15 whales presumed dead
- 2 whales resurrected
- 3 dead
- 63 contributors in 2018



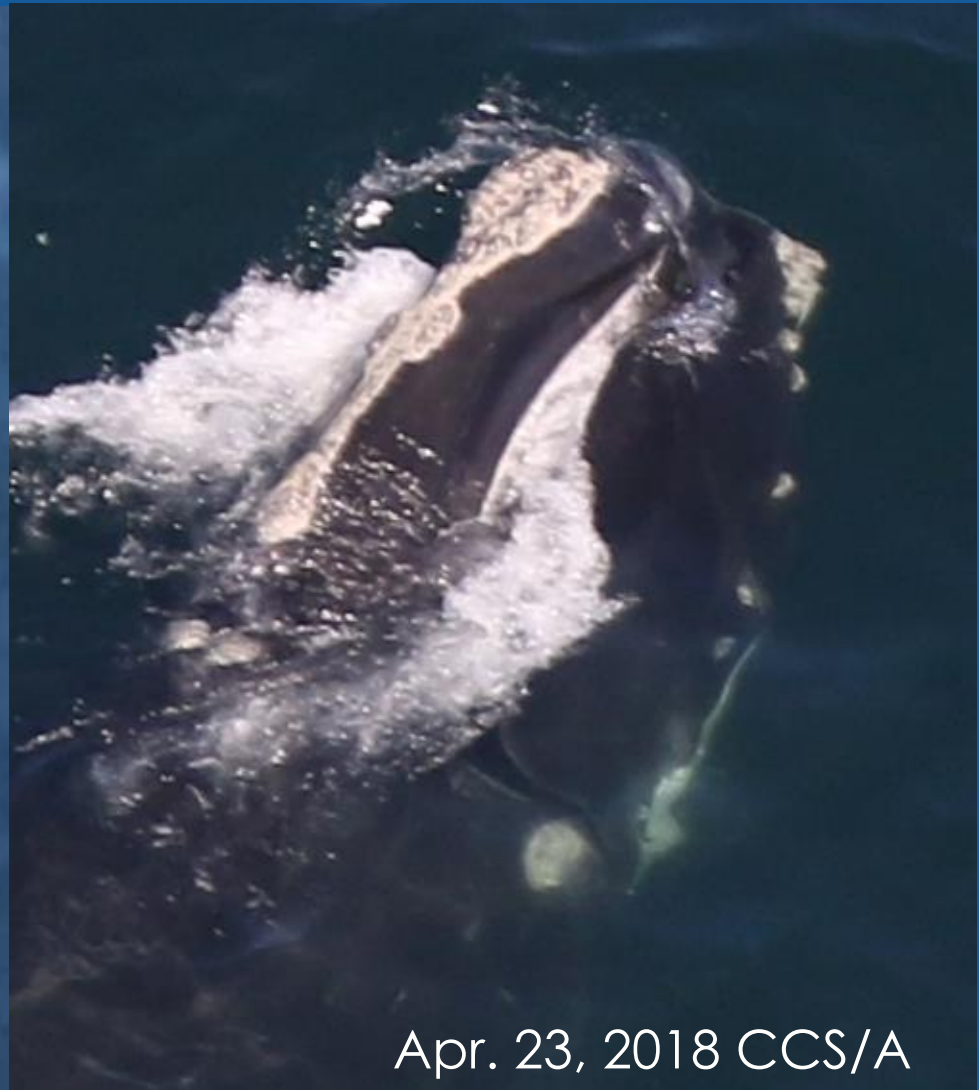
	Sex		First year sighted
	Female	3	2013 1
	Male	7	2014 1
	Unknown sex	2	2015 5
		12	2016 4
			2017 1
Age Class			
	Adult	0	
	Juvenile	12	
	Unknown age class	0	

# New whale #4304

May 18, 2013 NEFSC/T



Apr. 23, 2018 CCS/A



# Status of Matching

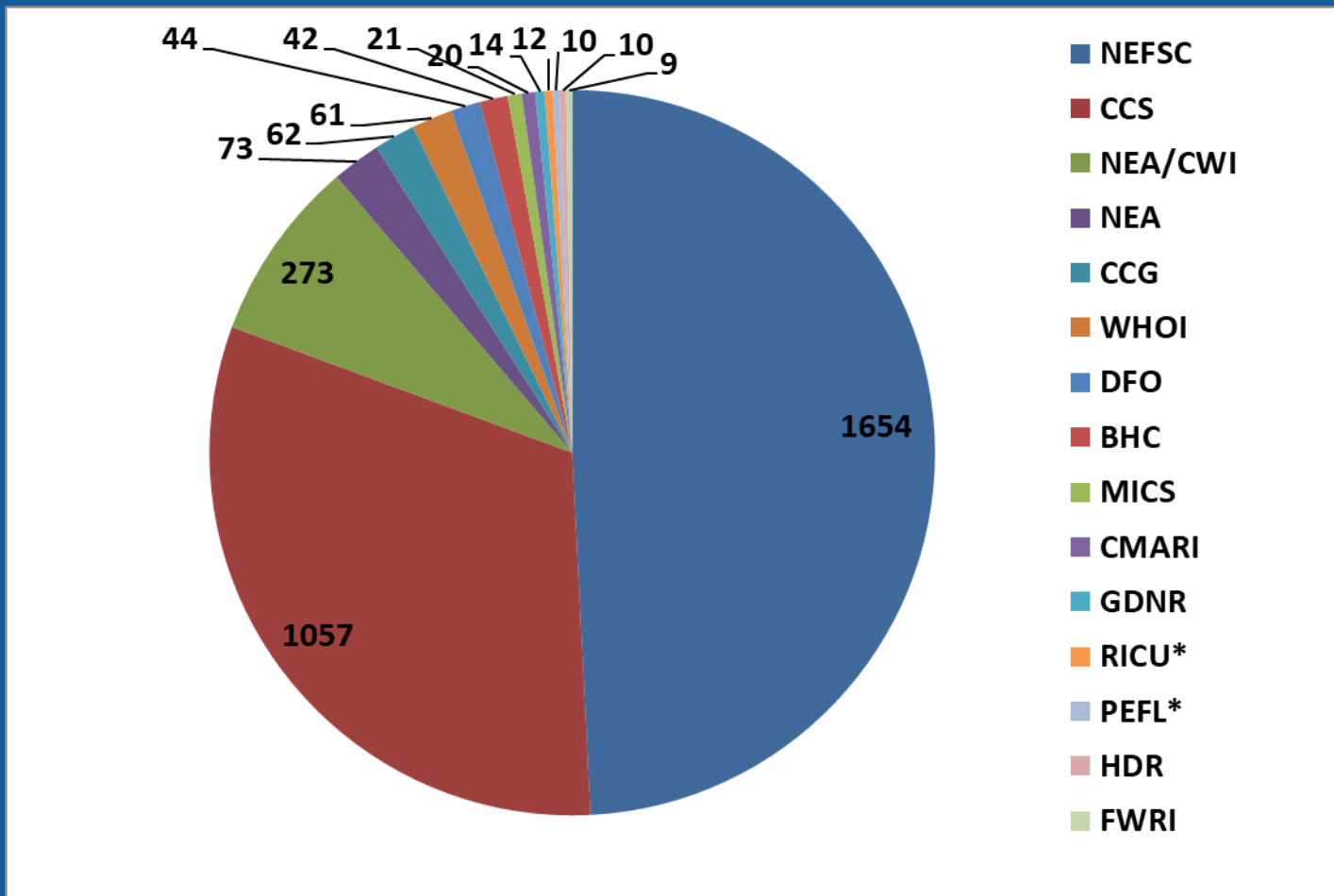
Year	Not Matched	Awaiting Confirmation	Matched	Confirmed Unmatchable	Total	Percent Complete
2005	7		3261	140	3408	99.8%
2006	22		2679	101	2802	99.2%
2007	46		3602	120	3768	98.8%
2008	13		4011	135	4159	99.7%
2009	60		4521	117	4698	98.7%
2010	24		3143	68	3235	99.3%
2011	61	1	3310	107	3479	98.2%
2012	62	1	2006	58	2127	97.0%
2013	96		1745	64	1905	95.0%
2014	109	2	2209	82	2402	95.4%
2015	102	3	1604	65	1774	94.1%
2016	52	7	2127	25	2211	97.3%
2017	127	11	2837	152	3127	95.6%
2018	2517	248	680	8	3453	19.9%

# Changes in contributions to the Catalog

Region	No. of Sightings	Percent of Total			
		in 2018	in 2017	in 2016	in 2015
NE (CCB/MB)	1607	53.3%	58.3%	39.7%	66.3%
NRTH (GSL)	1211	40.2%	23.0%	6.2%	5.5%
MIDA (south of Cape)	255	8.5%	9.5%	0.5%	4.3%
GSC	150	5.0%	4.5%	7.4%	3.8%
BOF	19	0.6%	2.3%	23.1%	2.5%
SEUS	46	1.5%	1.8%	17.9%	14.9%
GOM	146	4.8%	0.3%	5.0%	1.9%
JL	9	0.3%	0.2%	0.0%	0.2%
RB	0	0.0%	0.0%	0.1%	0.8%
EAST	10	0.3%	0.0%	0.1%	0.1%
	3453				

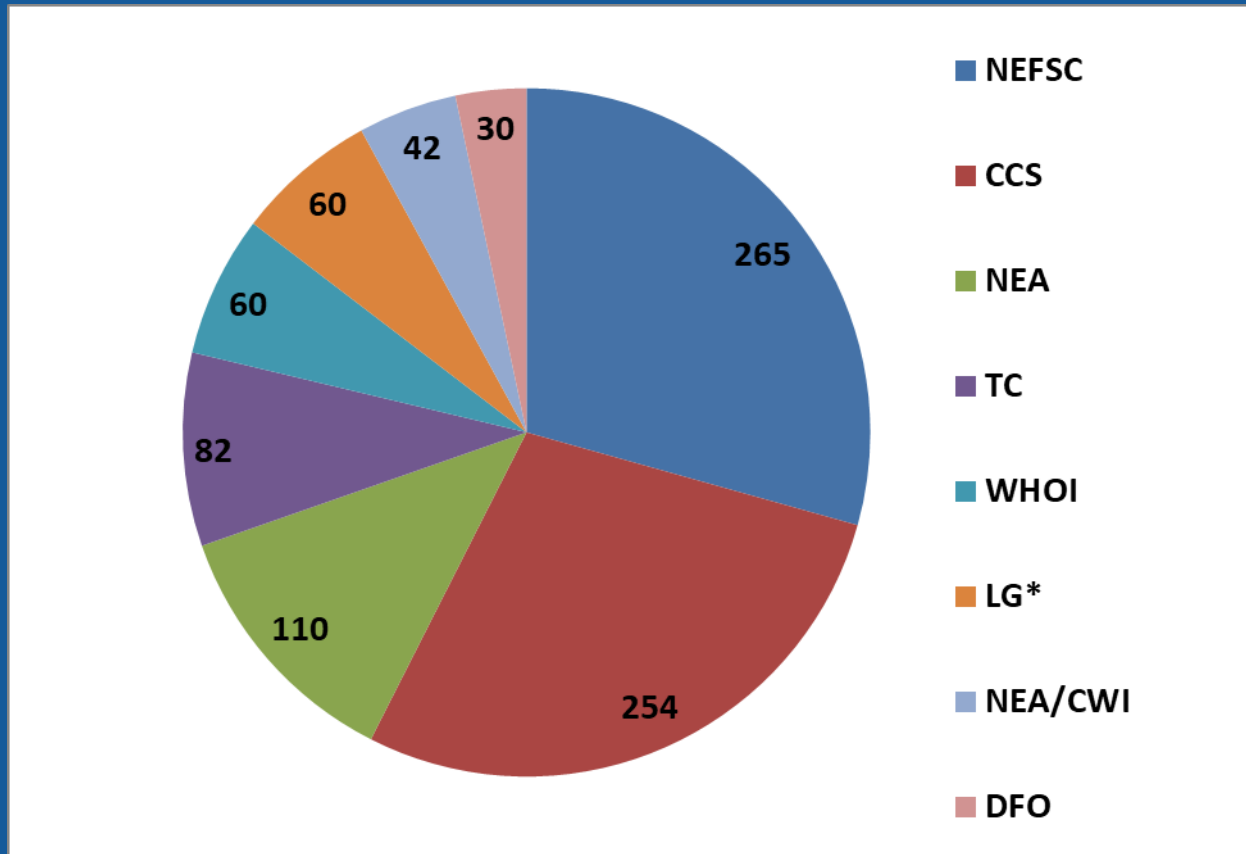
# Who Contributed 2018 Sightings

(only those who contributed 9 or more sightings listed below)



# Unique Whales ID'd by Group: 2017

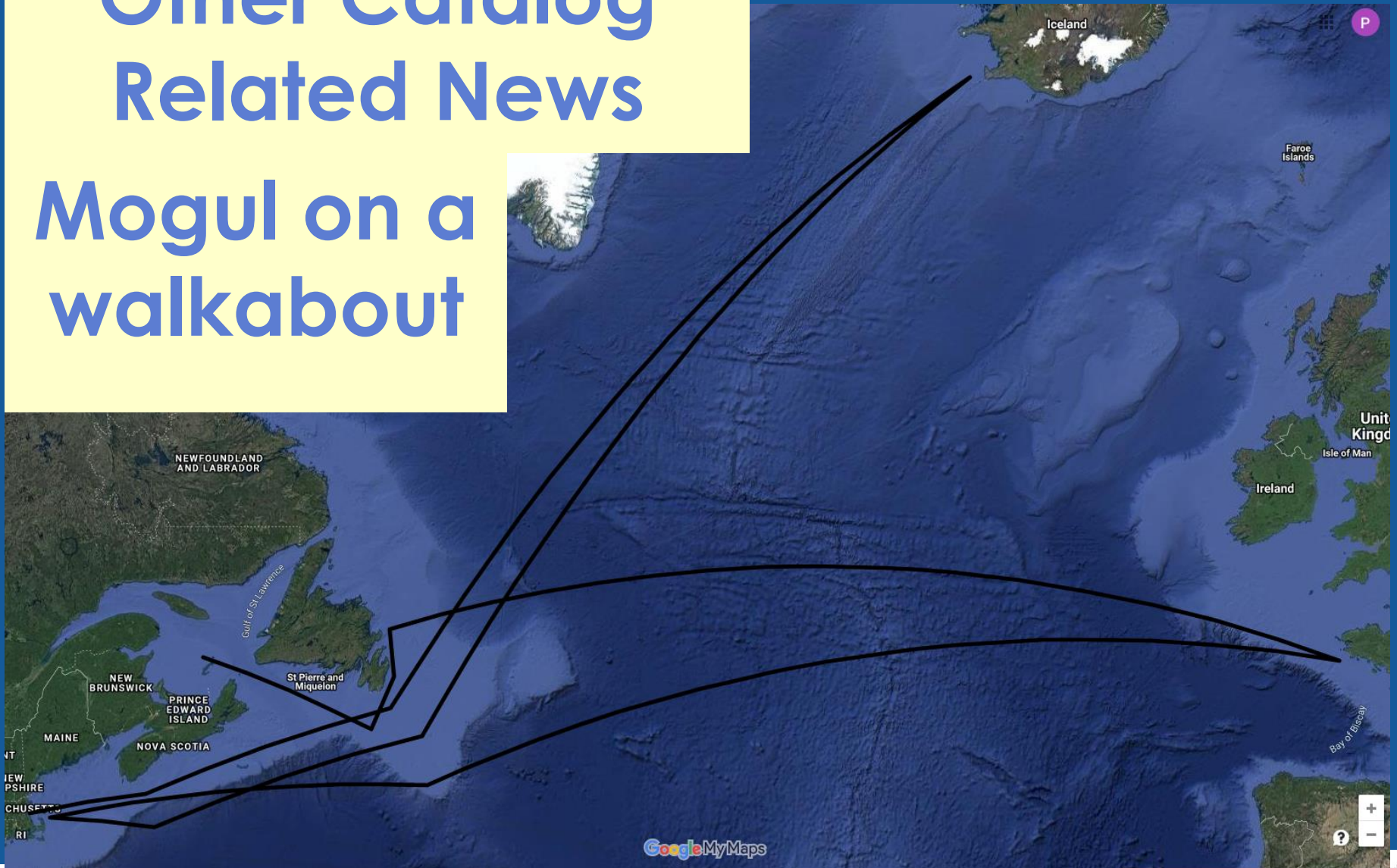
(only those who saw 10 or more whales listed below)





# Other Catalog Related News

## Mogul on a walkabout



# Other Catalog Related News

**Exported over 400,000 images so  
FlukeBook could train the automated  
matching algorithms**

**Redesigning the Catalog website  
([rwcatalog.neaq.org](http://rwcatalog.neaq.org)) and the photo-  
identification content on the ACCOL  
website**

# Naming Whales

- 259 names nominated (3 to 26 per whale)!
- 26 people from 14 organizations nominated
- 23 people voted 1<sup>st</sup> round, 21 2<sup>nd</sup> round
- 15 out of 15 successfully named (100%)



# #1036 "Peace"

Jul. 2, 2013  
NEFSC

Peace:	10
Woodstock:	08
No name:	03

Apr. 9, 2008 CCS



# #1616 "Owl"

Owl: 14  
No name: 07

Mar. 27, 2016  
WHOI/DR



# #2010 “Gandalf”

Apr. 13, 2017 NEFSC/S

Gandalf: 16  
No name: 05

Apr. 27, 2018 CCS



# #2340 “Swan”

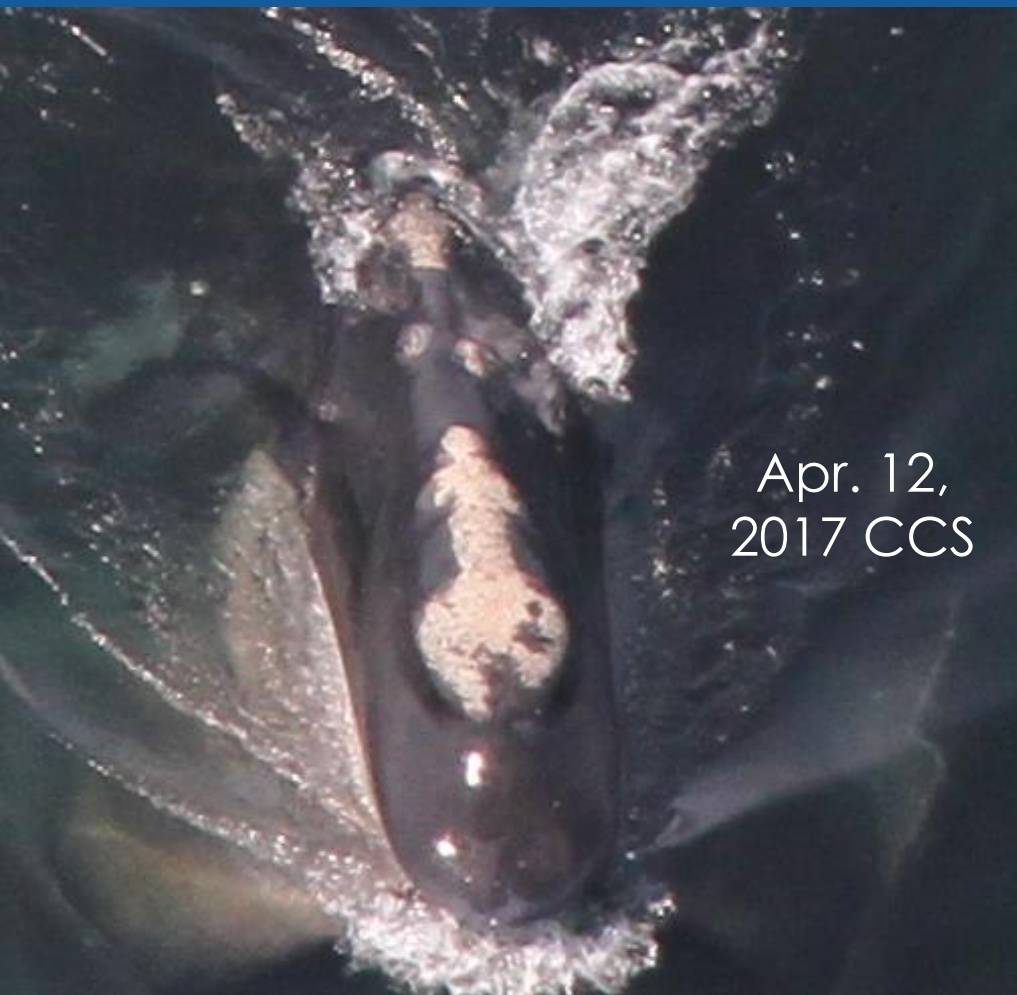
Swan: 12  
Ascot: 08  
No name: 01



Jul. 11, 2018 NEFSC

# #2413 “Nauset”

Nauset: 13  
No name: 08



Apr. 12,  
2017 CCS



Apr. 12, 2017 CCS

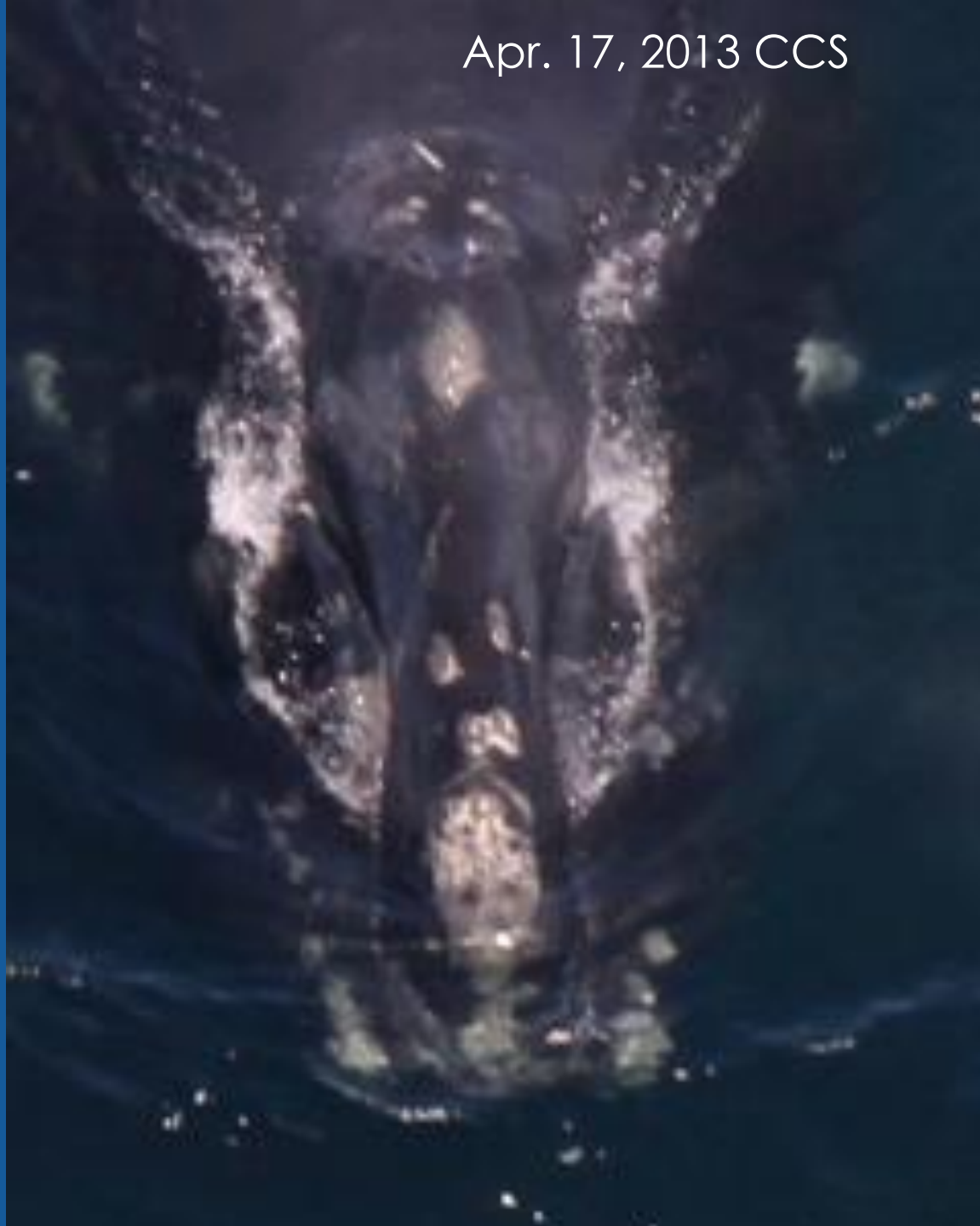


Apr. 17, 2013 CCS

# #2510

## “Mitosis”

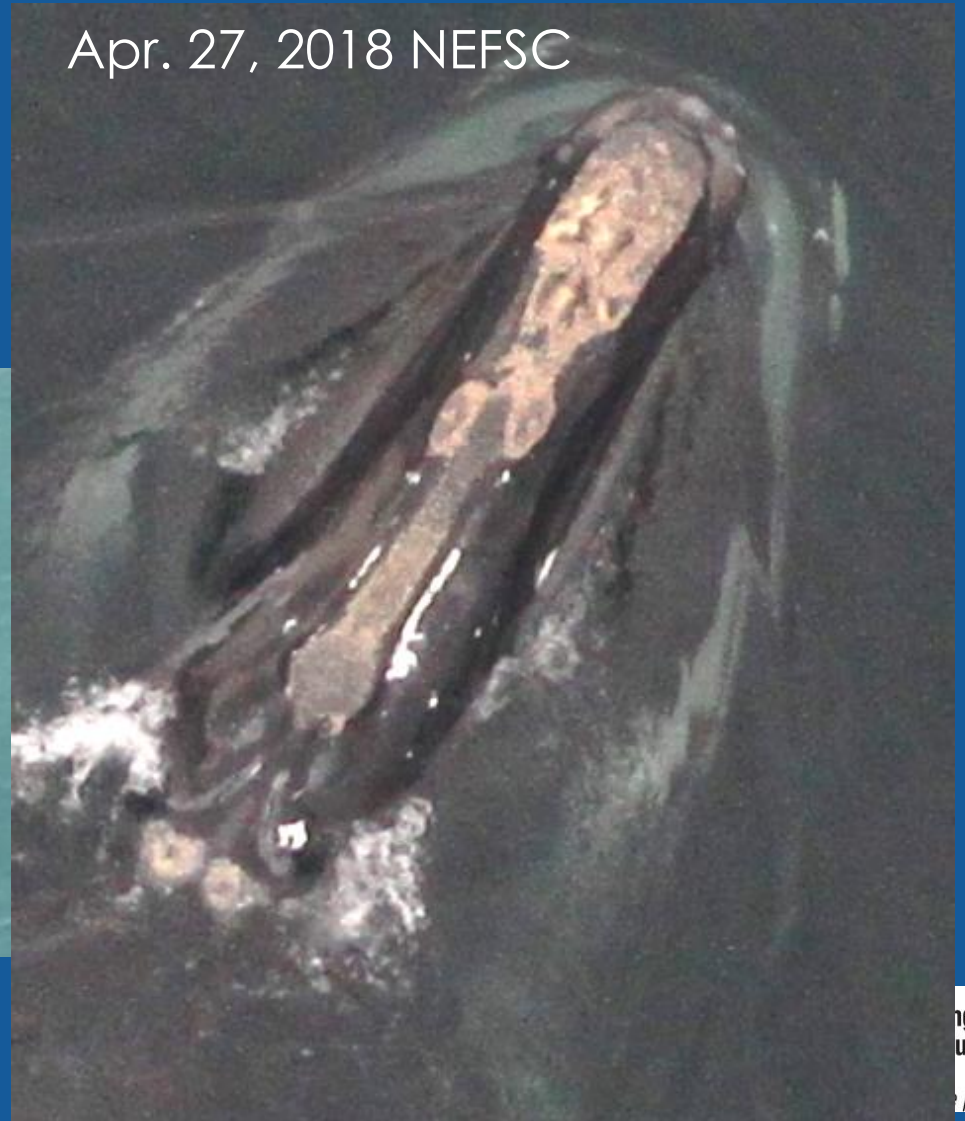
Mitosis: 14  
No name: 07



# #3120 "Oakley"

Oakley: 11  
No name: 10

Apr. 27, 2018 NEFSC



Jan. 21, 2018 NEA



# #3290 Arrow

Arrow: 15  
No name: 06

Apr. 14, 2017 NEA



# #3620 “Lone Star”

Lone Star: 15  
No name: 06

Feb. 27, 2012 CCS



Jul. 5, 2018 NEFSC

# #3823 Sundog

Sundog: 17  
No name: 04



Aug. 12, 2018 NEA/CWI

#3912 “Sickle”

Sickle: 16  
No name: 05



Jun. 12, 2017 SBNMS

# #3920 Cottontail

Cottontail: 10  
Bunny: 06  
No name: 05

Apr. 28, 2013 NEA



# #4194 "Popcorn"

Popcorn: 14  
No name: 07

Apr. 17, 2017 CCS





# #4601 Gully

Gully: 20  
No name: 01

Jul. 17, 2019 NEA/CWI



# #4650 “Sebastian”

Sebastian: 17  
No name: 04

Aug. 10, 2019 NEA/CWI



Thanks to:

- this extraordinary community of dedicated, passionate, collaborative people,
- to the Consortium for providing the glue, and
- to NMFS for the long-standing support of the Catalog maintenance

# Acknowledgements

