

# STRANDED BELUGAS IN COOK INLET

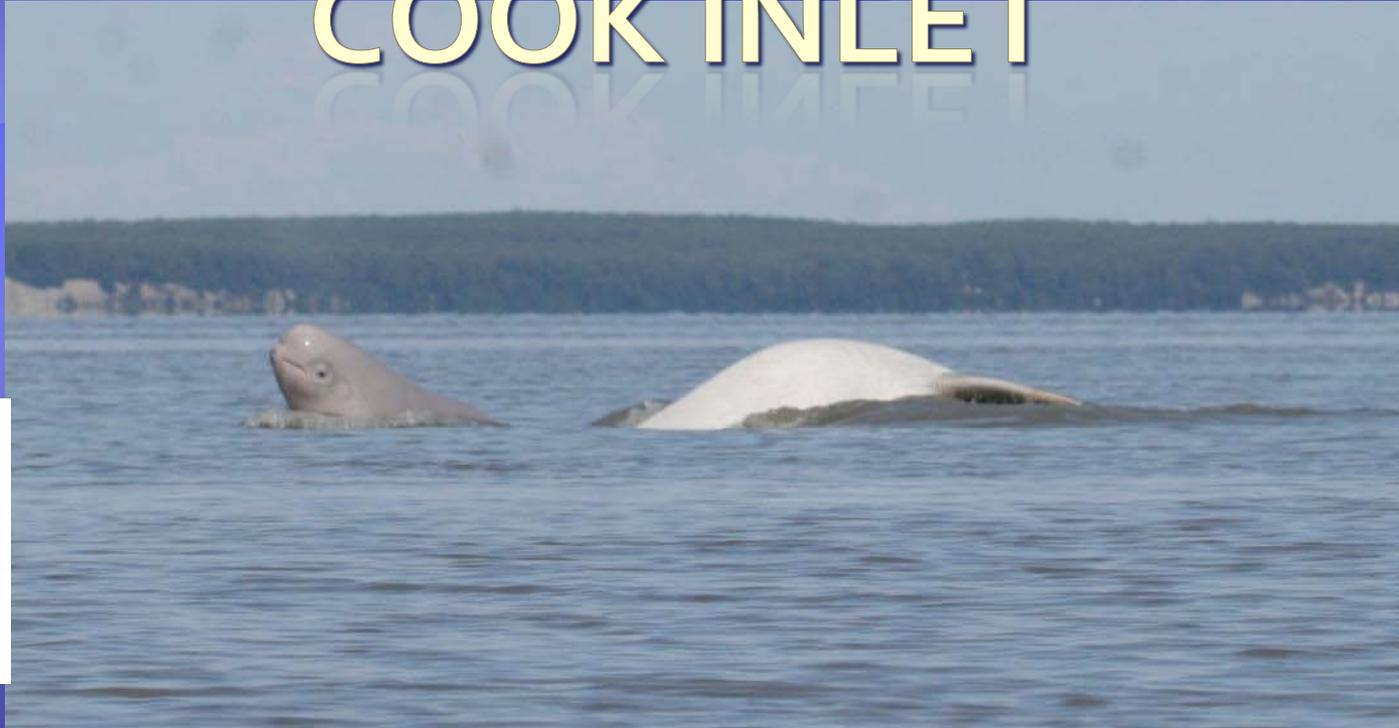
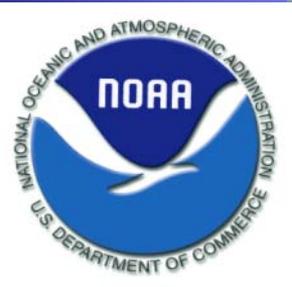


Photo provided by C. Garner



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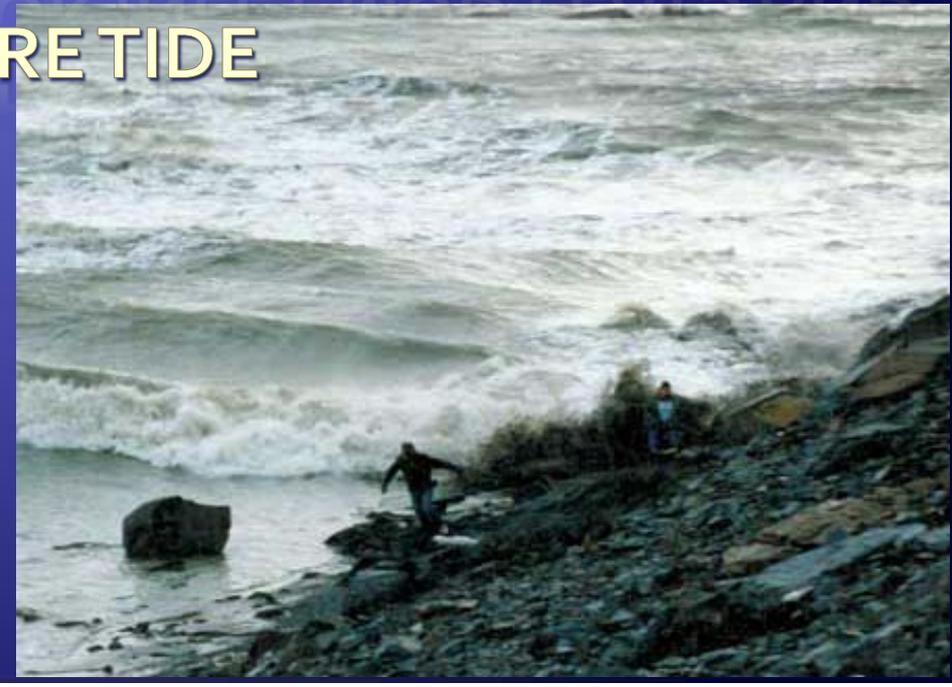
Barbara Mahoney, Brad Smith, Mandy Magura

NMFS





## COOK INLET MUD FLATS AND BORE TIDE



# NECROPSY COMPONENTS



## Gross necropsy

- ◆ Morphometrics
- ◆ Carcass condition scoring
- ◆ Body condition scoring
- ◆ Examination for significant lesions
- ◆ Interpretation of the findings

## Samples

- ◆ Histopathology
- ◆ Life History samples
- ◆ Contaminants and biotoxin
- ◆ Diseases
- ◆ Archives – AMMTAP (NIST) and Museum of the North

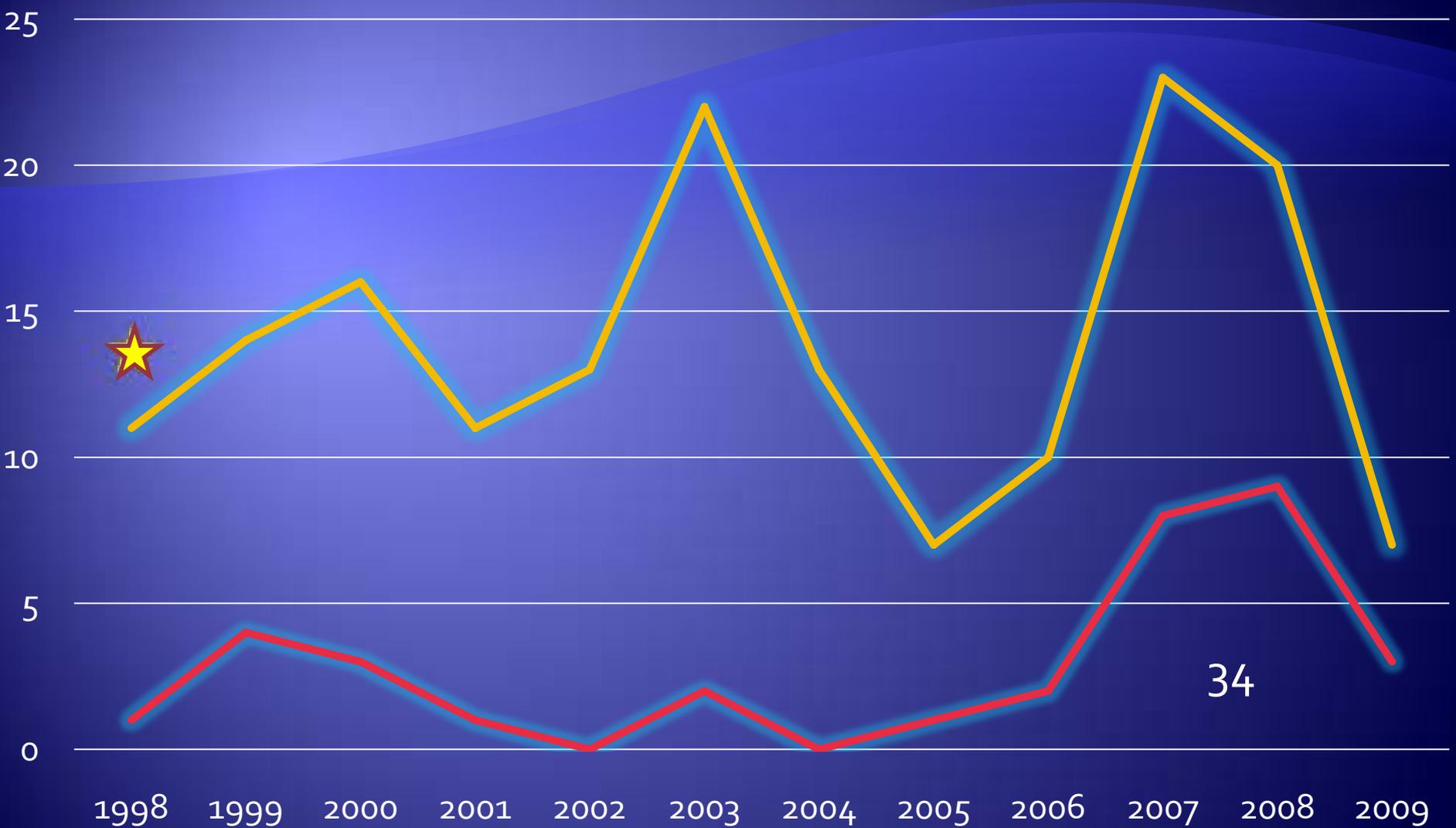
# IF POSSIBLE, SALVAGE OF BLUBBER IN THE NATIVE COMMUNITIES



# WHAT DID WE FIND?

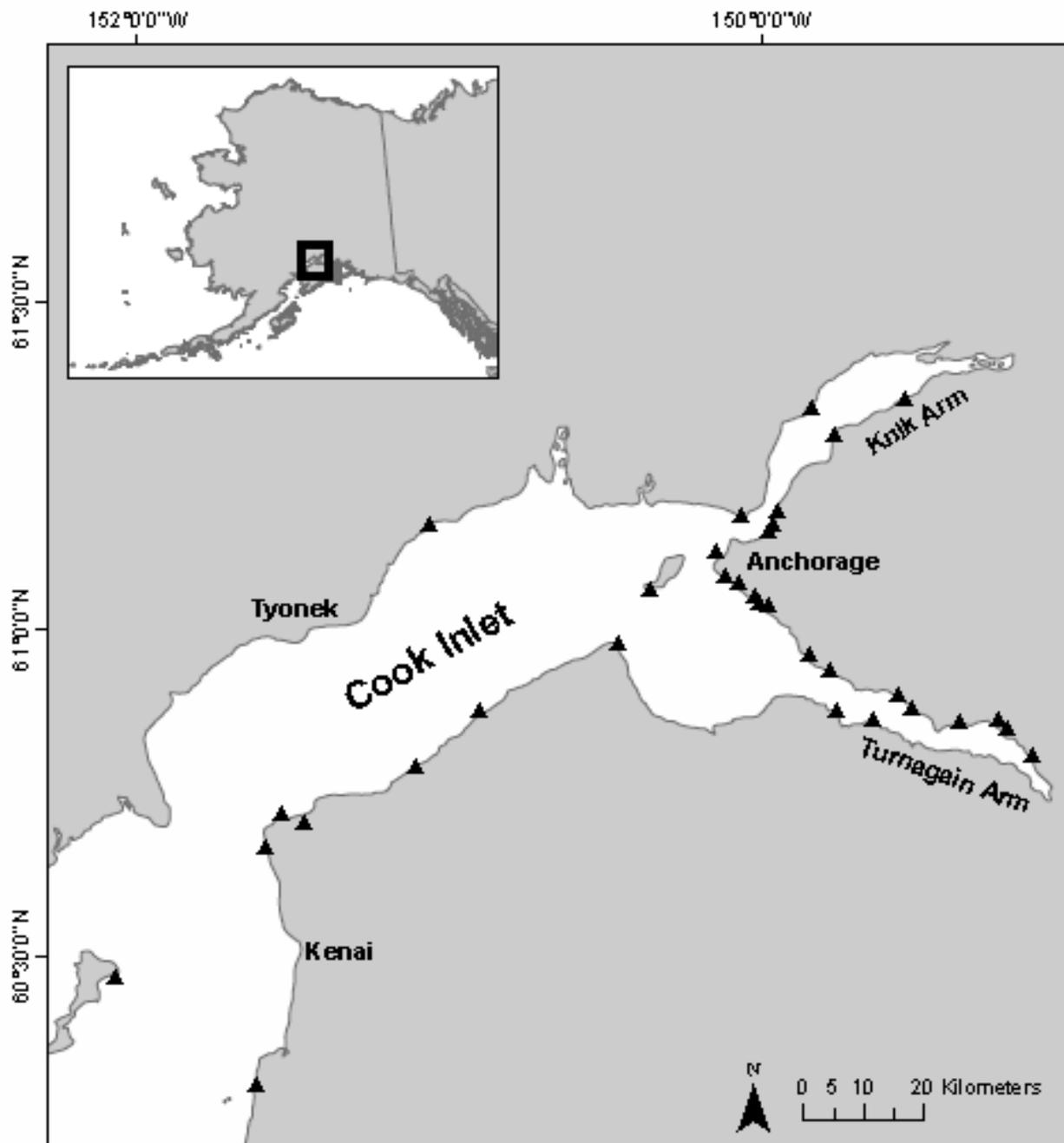


# Recorded Mortalities vs. Necropsied Belugas



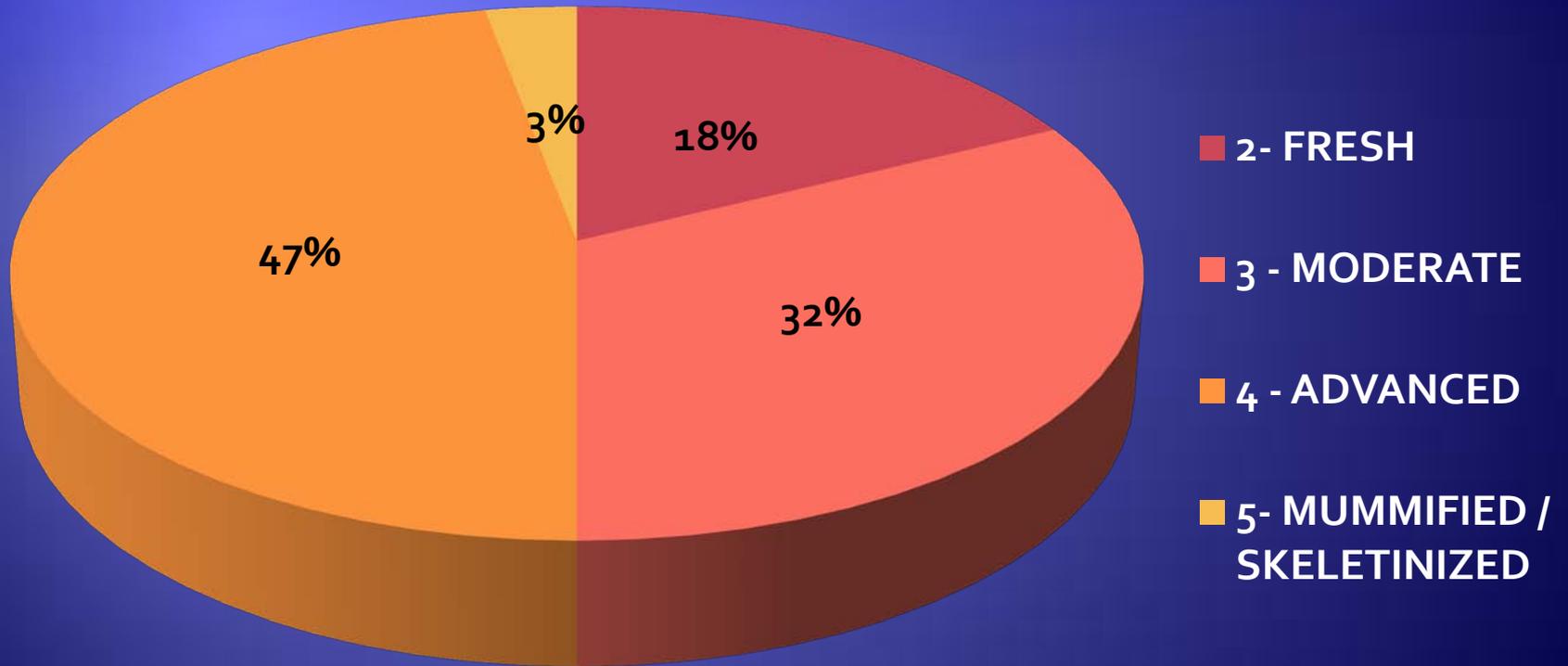
— # necropsied    — stranding morts

 NMFS, archives



## DISTRIBUTION OF NECROPSIED BELUGAS.

# CARCASS CODES



# AGE AND REPRODUCTIVE STATUS

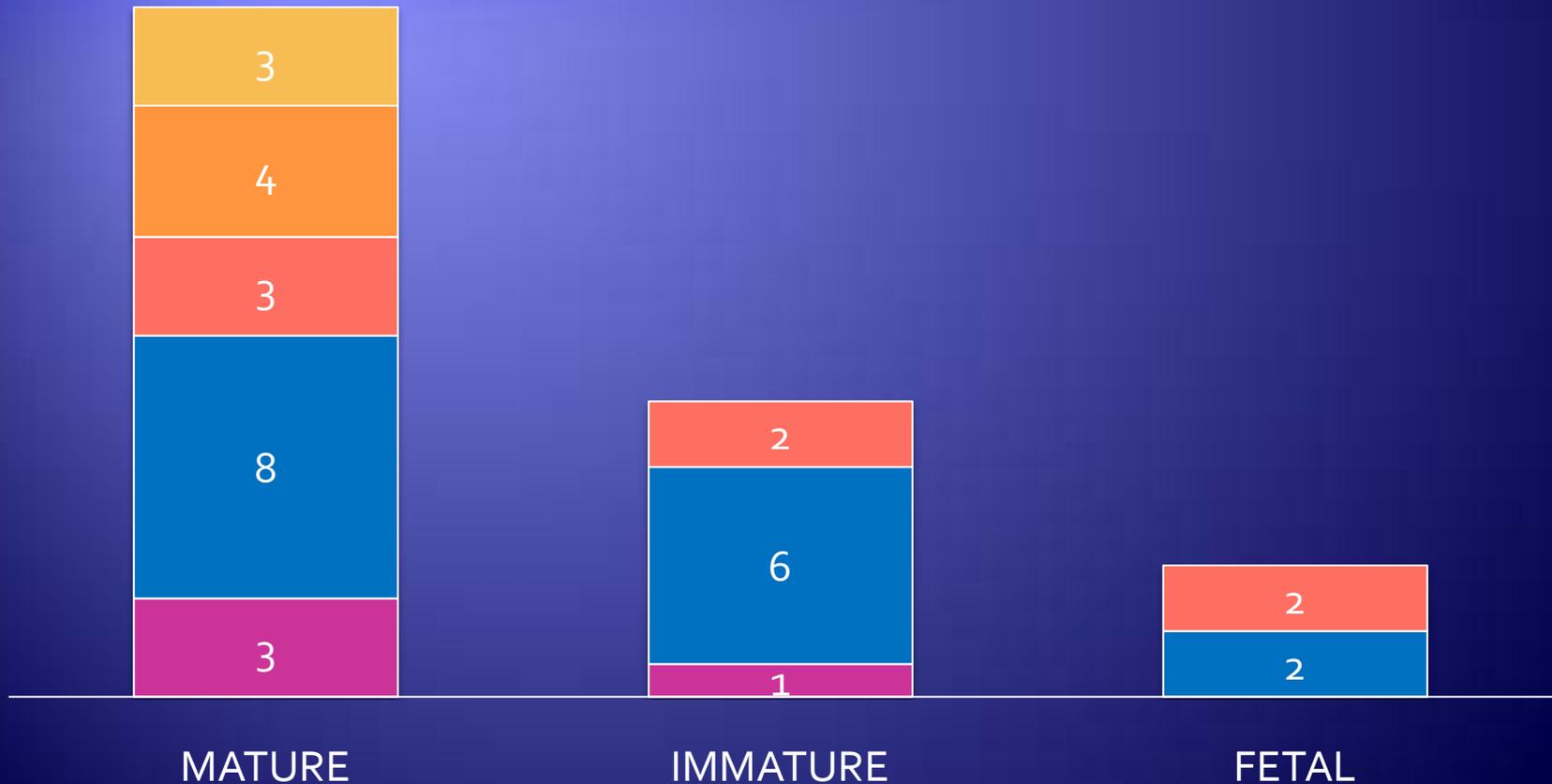
■ UNK SEX

■ FEMALE - NS

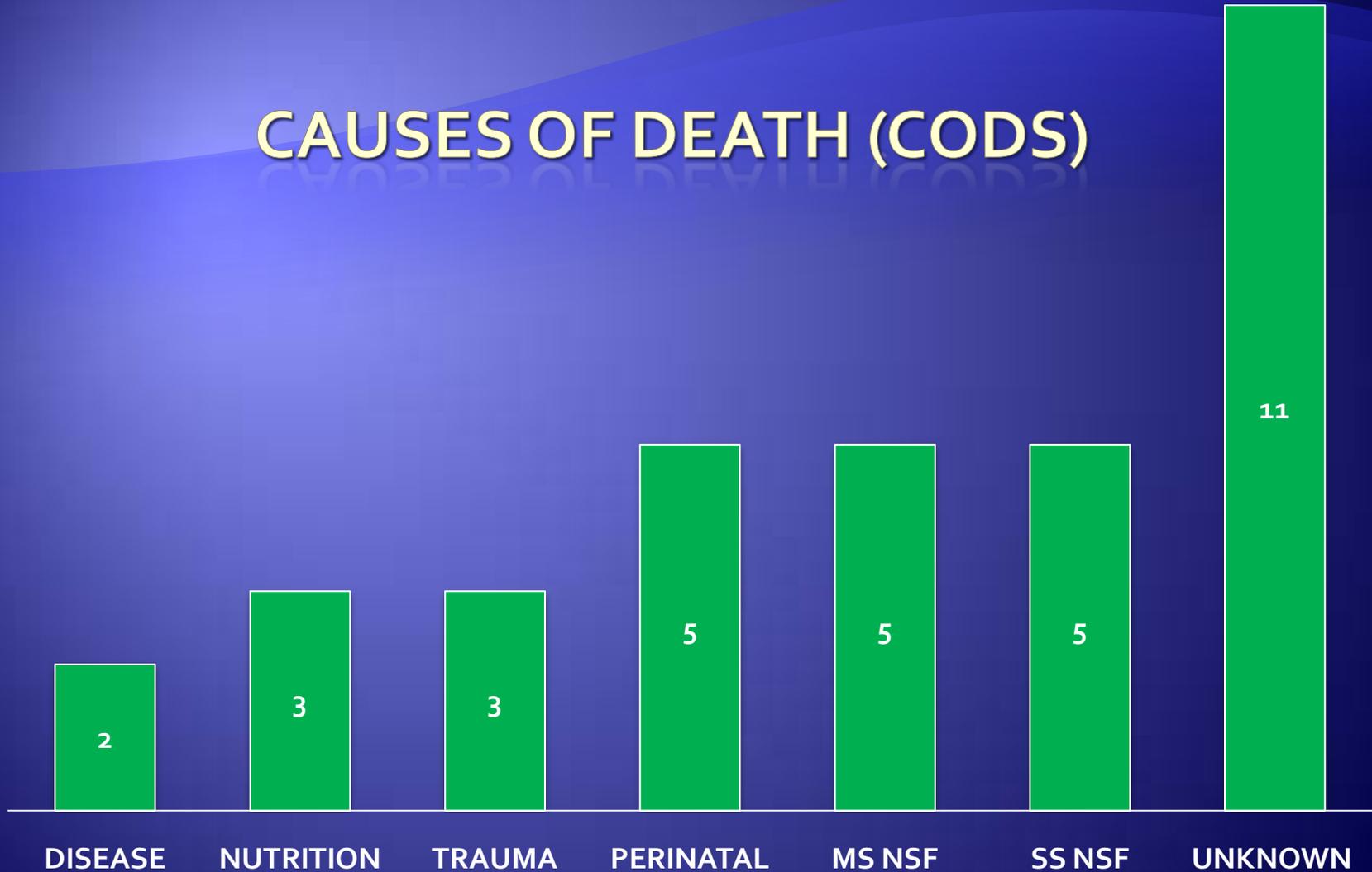
■ FEMALE - POST PARTUM

■ MALES

■ FEMALE - PREG.

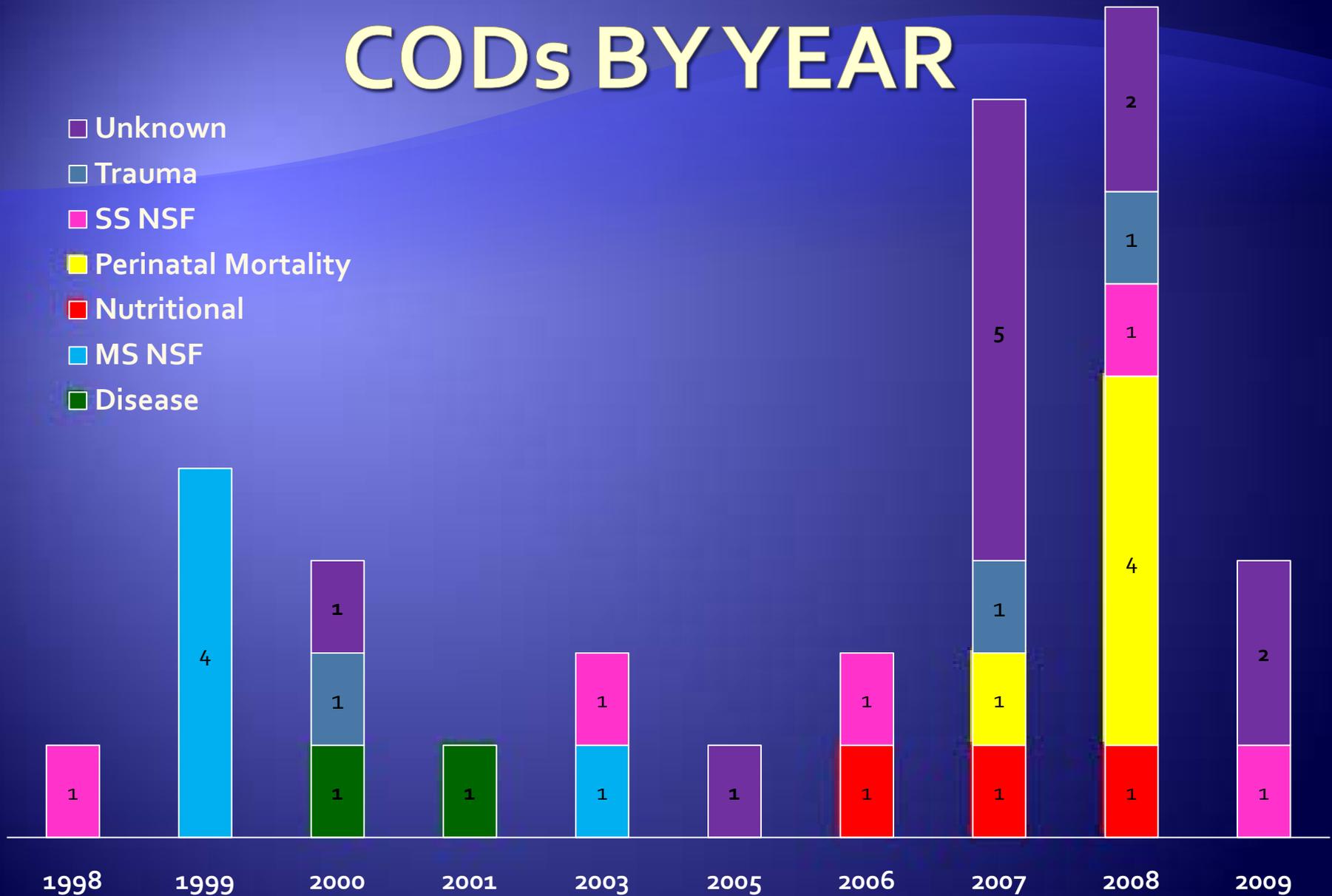


# CAUSES OF DEATH (CODS)



# CODs BY YEAR

- Unknown
- Trauma
- SS NSF
- Perinatal Mortality
- Nutritional
- MS NSF
- Disease



# LARGE PROPORTION OF UNKNOWN CODS.



# MASS AND SINGLE STRANDINGS NSF

Single stranding - 5

Mass stranding – 5



# PERINATAL DEATHS / ABORTIONS AND PREGNANT OR LACTATING FEMALES

3 Pregnant Females; - 2006, 08, 09

3 post partum – 2000, 08, 09

Aborted fetuses- 2008

1 Neonate



# NUTRITION (6/34)

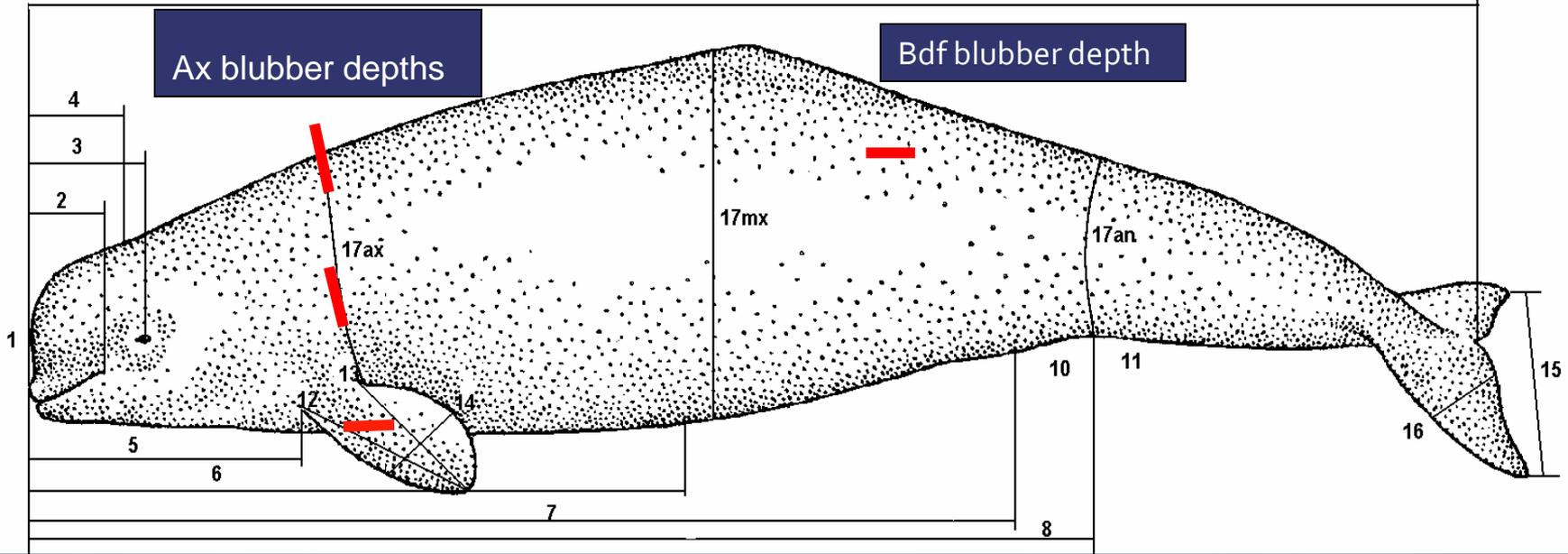
- COD (n=3)
  - young males in JI/Aug
- 3 animals – Contributory
  - 1 fetus, 2 calves
  - July, Aug., Oct., Sept.
- Thin blubber (0-3 cm)
- Empty stomachs.
- 1 calf with systemic herpesvirus
- BIG PROBLEM – WHAT IS REALLY “NORMAL?”
- MEASURABLE SCORING?



# SAMPLING PROTOCOLS: MORPHS

Snout to center of eye	Thickness of dorsal Ax blubber
Snout to center of blowhole	Thickness of lateral Ax blubber
Snout to fluke notch	Thickness of ventral Ax blubber
Width of fluke	Blubber depth behind dorsal ridge
1/2 Axial circumference	Weight of the L1-L12 epaxial muscle
1/2 anal circumference	

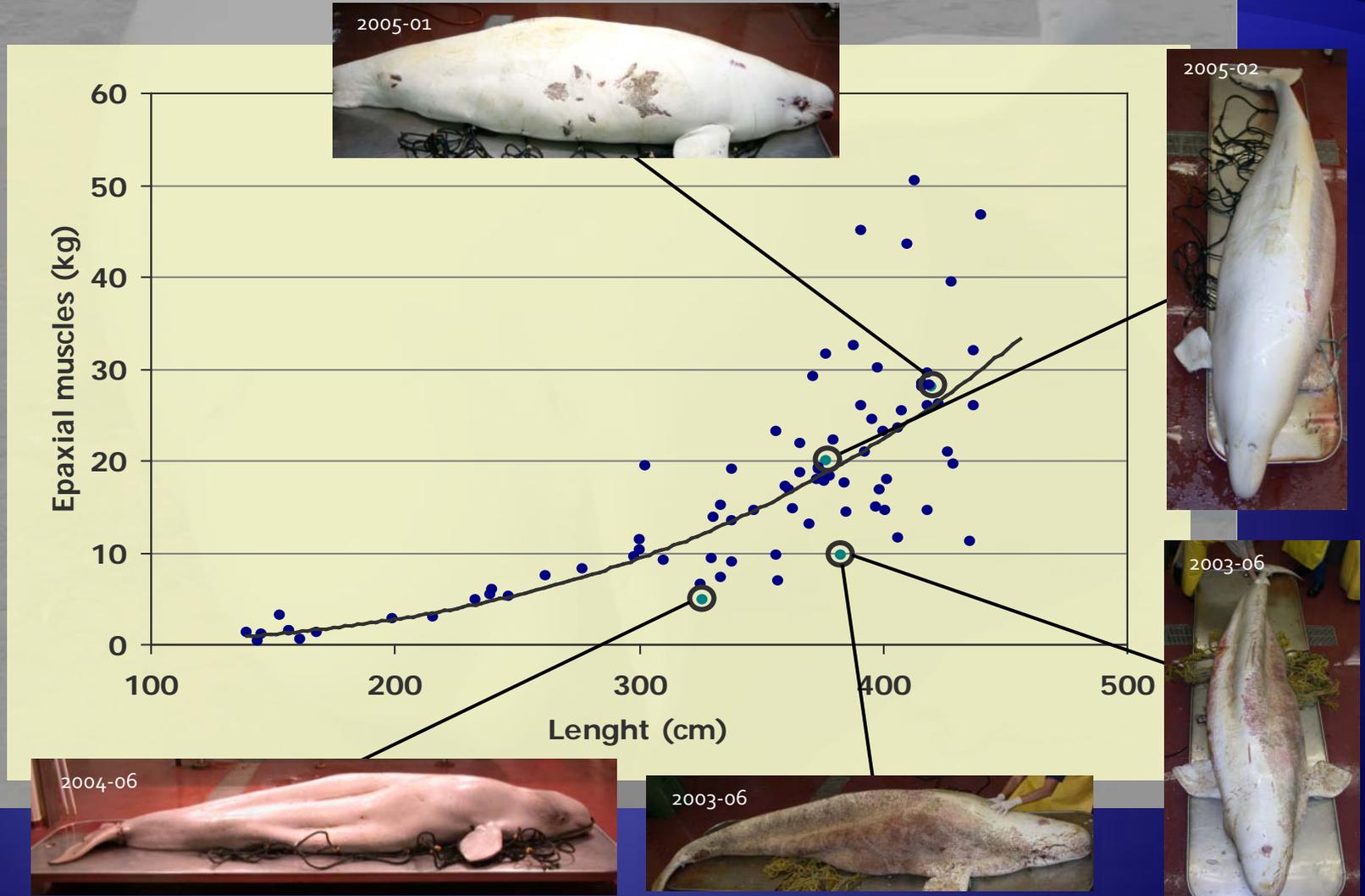
9





KBH062810-01  
6/30/10  
Pl Possession

# Weight epaxial muscles / Total length



Graph and photos compliments of Dr. S. Lair; St. Lawrence seaway pathologist – Quebec, CANADA

# TRAUMA

- 5 cases
- TRAUMA – non-specified and KW.
- 3 COD
- 1 contributory
- 1 Incidental
- Two were previously reported in Sheldon et al 2003.
- Could be missing some trauma – human and KW.



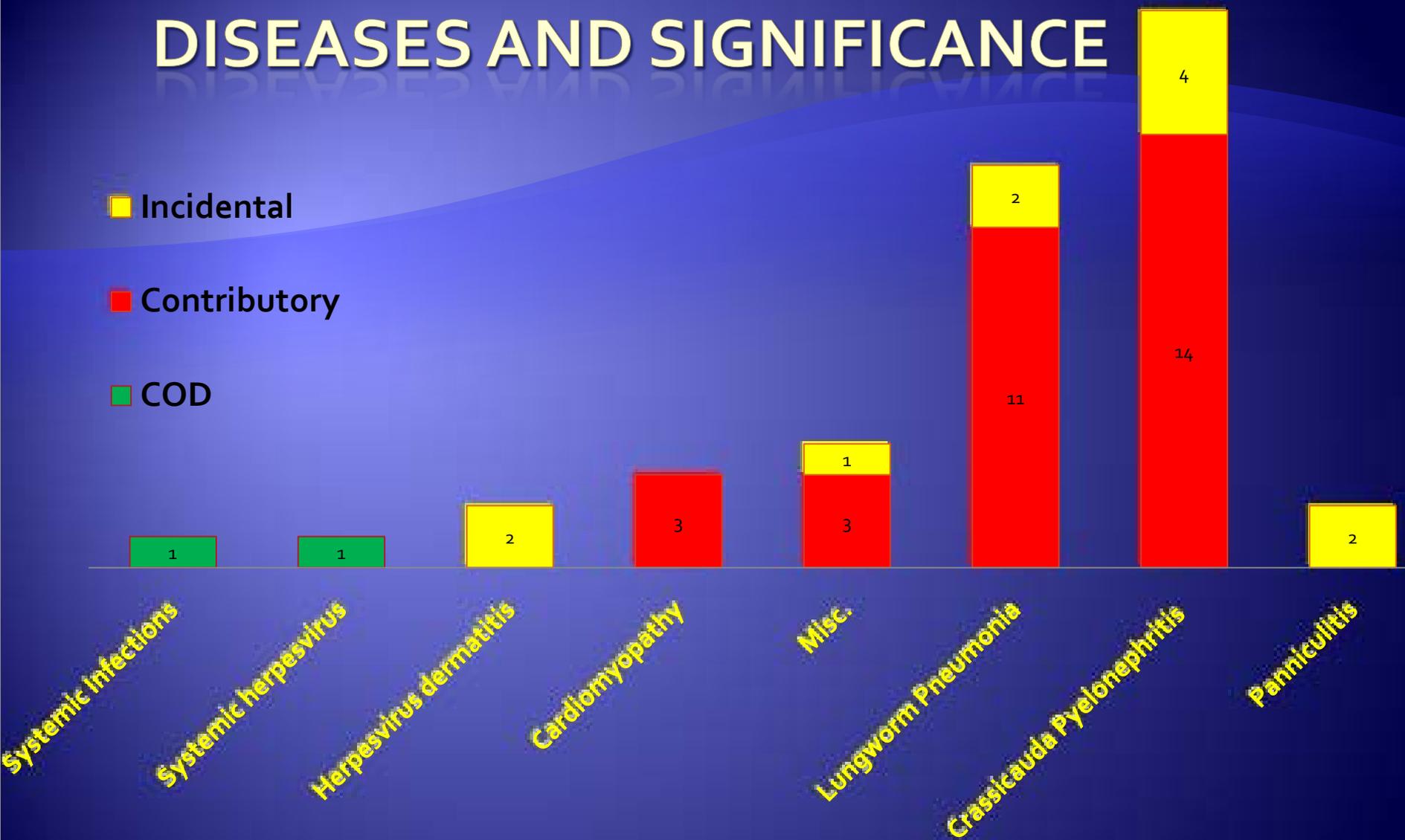
Sheldon, KEW, Rugh DJ, Mahoney BA, ME Dahlheim. 2003. Killer Whale predation on belugas in Cook Inlet, Alaska: Implications for a Depleted population. *Marine Mammal Science*. 19:529-544.

# DISEASES AND SIGNIFICANCE

Incidental

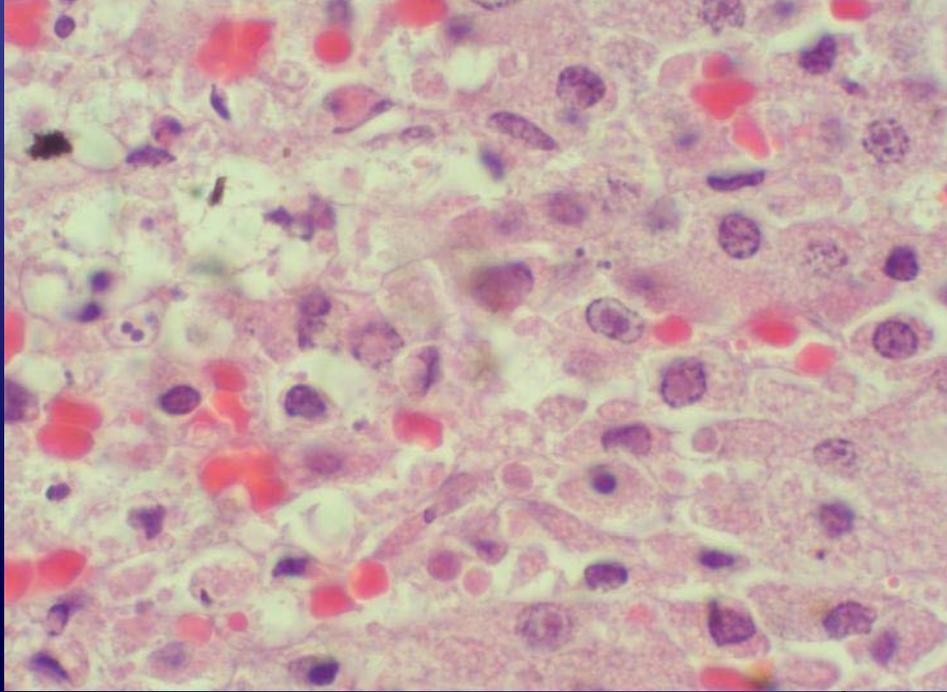
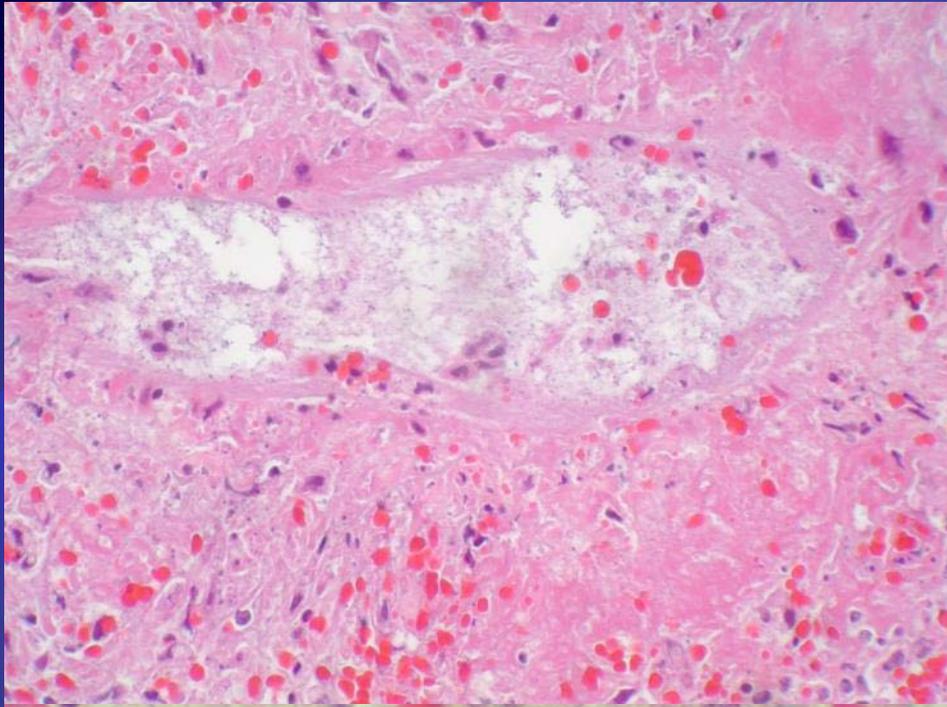
Contributory

COD



Misc. includes: A contributory pulmonary congestion, a mild lymphocytic Meningoencephalitis, pleuropneumonia and an incidental Sarcocystis sp. cyst in the muscle

# SYSTEMIC HERPESVIRUS



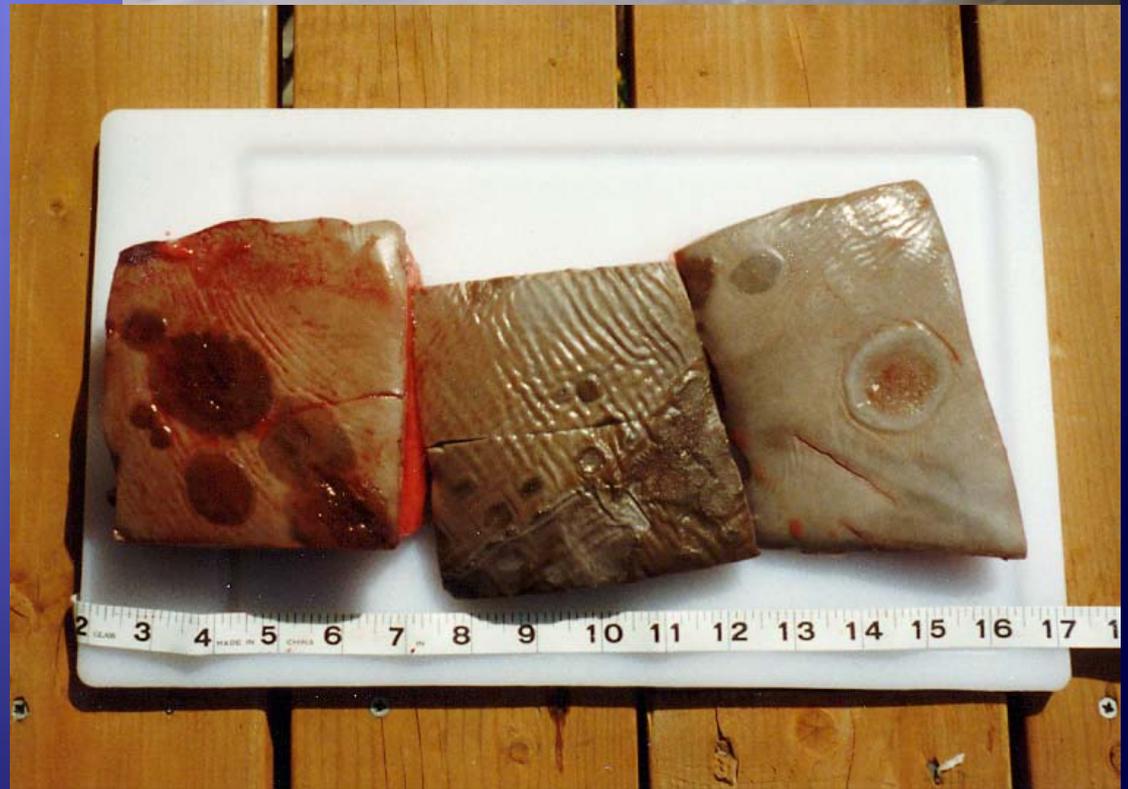
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# HERPESVIRUS DERMATITIS

• 2 / 34

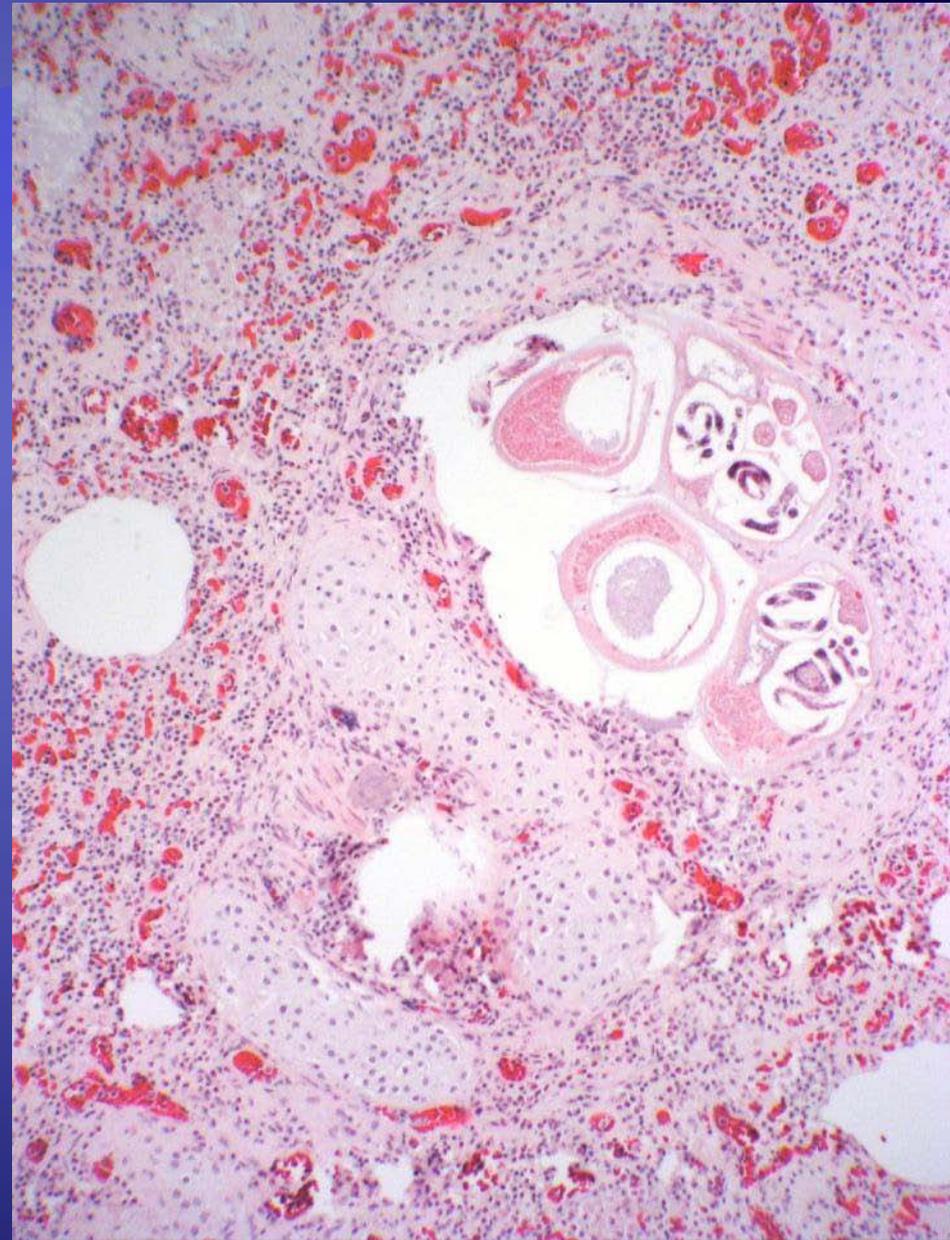
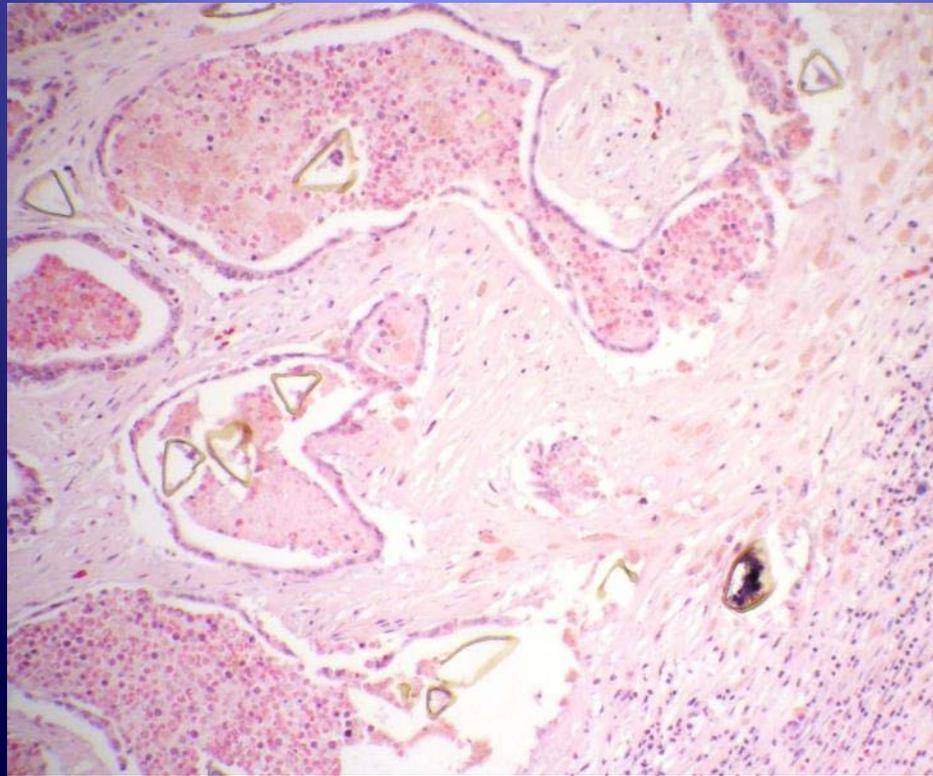
- Problems are being seen as a new lesion in Churchill thought to be due to herpesvirus.
- Seen in captive animals
- One case in St. Lawrence
- Positive in a few blowhole swabs in live-capture Bristol Bay animals.
- More an indicator of stress ?



# SYSTEMIC INFECTIONS

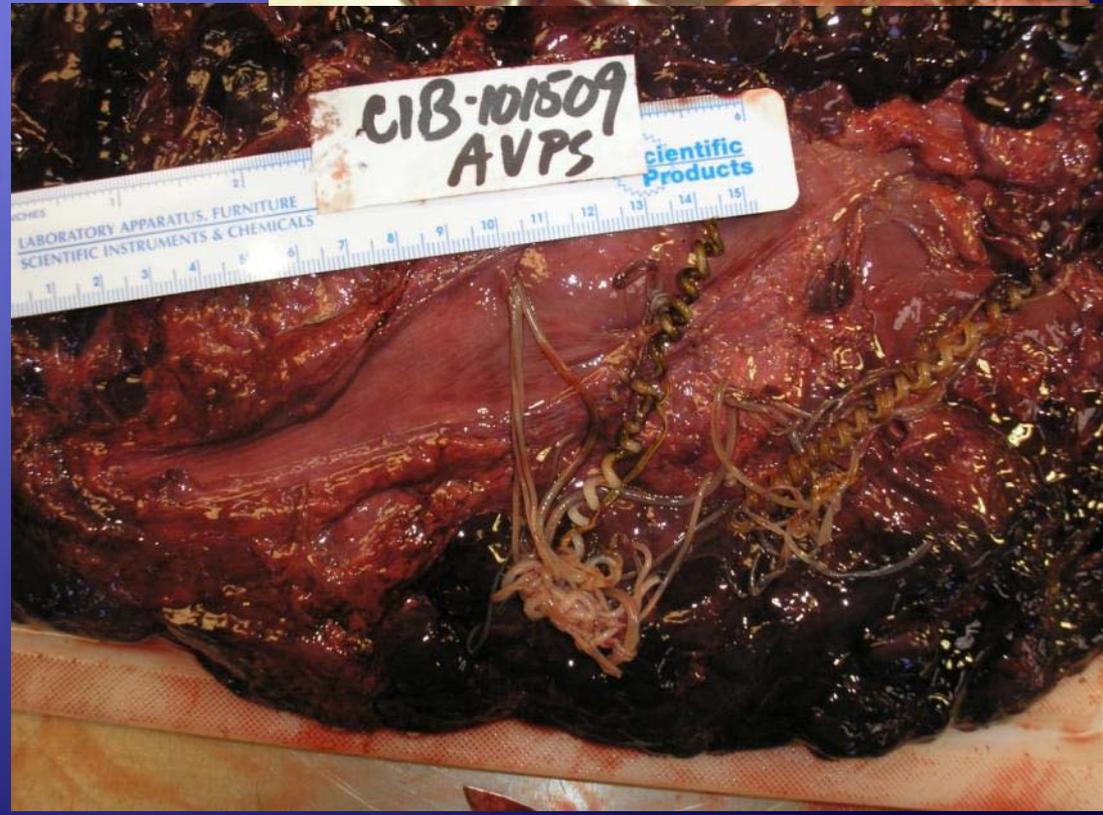
young Voo-089

Bronchopneumonia, Necrotizing  
hepatitis, liver flukes, necrotizing skin  
and tongue lesions



# CRASSICAUDA GILIAKIANA

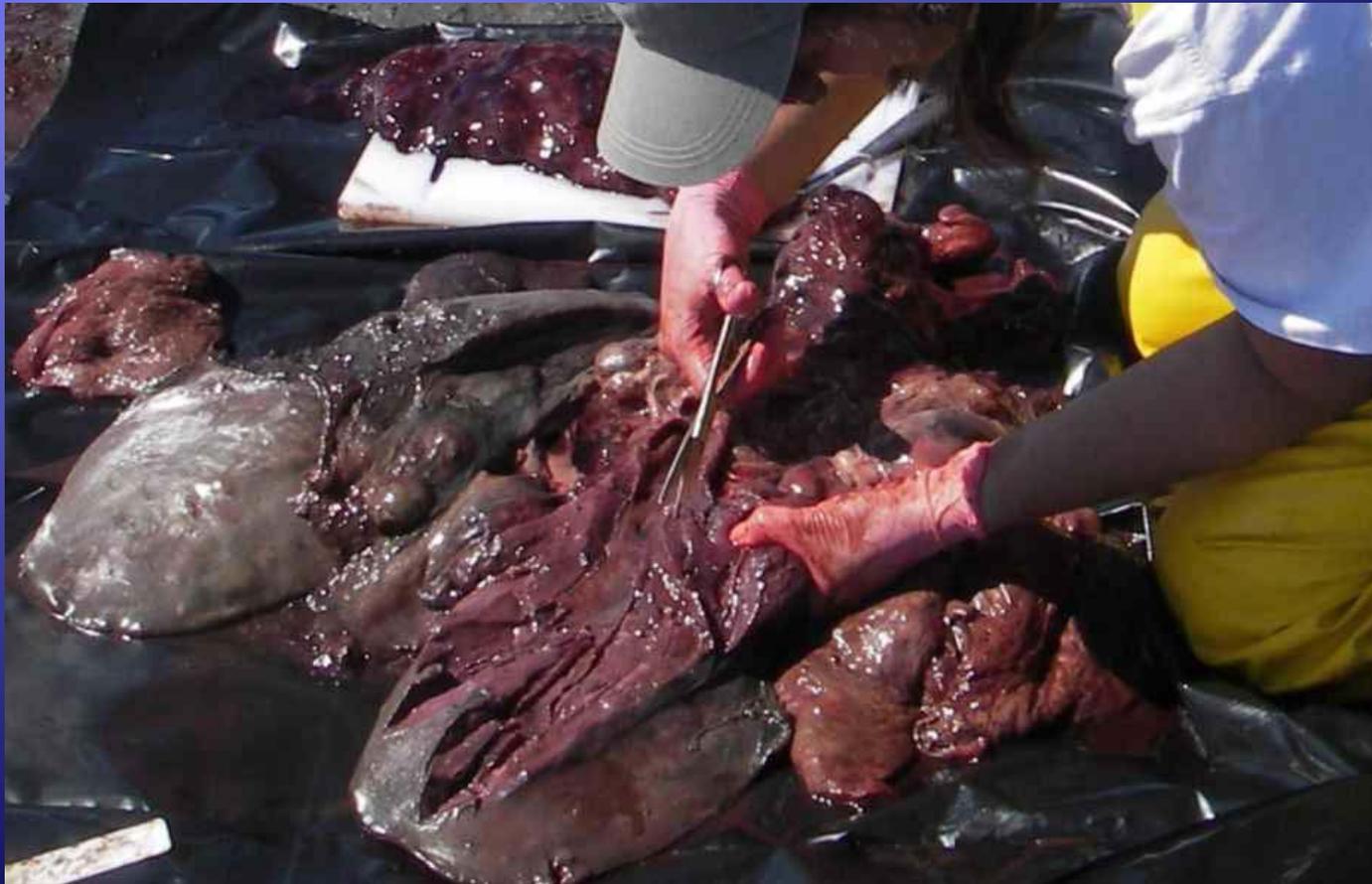
- ◆ 18/25 POS (72%)
- ◆ Rare in other Alaskan and Canadian belugas.



# Lung worms

## Collaborative study

- ◆ Dr. Lena Measures
- ◆ Entire lung collected
  - ◆ Histopathology
  - ◆ Parasite ID and enumeration



# ANCILLARY TESTS - HABS

	# Animals	# samples	# POS	# NEG	% POS
DOMOIC ACID	15	21	1	14	7%
SAXITOXIN	12	17	0	17	0

# ANCILLARY TESTS - BACTE

	No. Animal	No. samples	RESULTS
Aerobic cultures	8	29	NEG or PM overgrowth 1 – Aeromonas sp. 1- Vibrio parahaemolyticus
Fecal pathogens	8	21	3 – Edwardsiella 2 – Aeromonas sp. 3- Enterococcus sp. 3- Pleisomonas sp. 0 - Salmonella Campylobacter, E. coli o157, C. difficile etc.
Brucella PCR	5	17	ALL NEGATIVE
C&S	2	2	SENS TO ALL BUT PENICILLIN AND NEOMYCIN
Chlamydophila sp. (ELISA)	2	3	NEG

# Parasitology:

Agent	# ANIMALS EXAMINED	%POS
Protozoa PCR	3	0%
Crassicauda giliakiana	25	72%
Lungworms	34	38%
Blubber Crassicauda Sp.	25	36%

# VIROLOGY – ANCILLARIES

Virus	SAMPLES	% Pos
Herpesvirus PCR	2	50%
Morbillivirus PCR	13	0%
Viral fecal EM	2	0%
Viral culture	3	0%

# CONCLUSIONS:

- ◆ Many cases have an UNKNOWN COD.
  - ◆ Poor carcass condition
  - ◆ Use more molecular techniques
  - ◆ Are there ways to get out to carcasses more often and more quickly?
  - ◆ Tagging live strands and follow
  - ◆ Consider adding in live-capture / biopsy work in addition to the necropsies.



# MS-NSF and SS-NSF / Trauma

- ◆ Significant proportion of cases are result of strandings in seemingly otherwise healthy individuals.
- ◆ Adults / Pregnant and lactating females
- ◆ Killer whale?
- ◆ Changing distribution of the belugas into the riskier areas.
- ◆ Changes in Bathymetry?
- ◆ Tag or mark else-wise when live-stranded



# Nutrition

- ◆ Cases have been in the last couple of years 2006, 2007, 2008
- ◆ Jl, Aug, Sept, Oct.
- ◆ What is changing?
- ◆ Salmon and other fish stocks?
- ◆ We need better methods of coding body condition



# DISEASES AND SIGNIFICANCE

Detected significant disease in  
2/6 "fresh" animals

Antibiotic resistant bacteria?

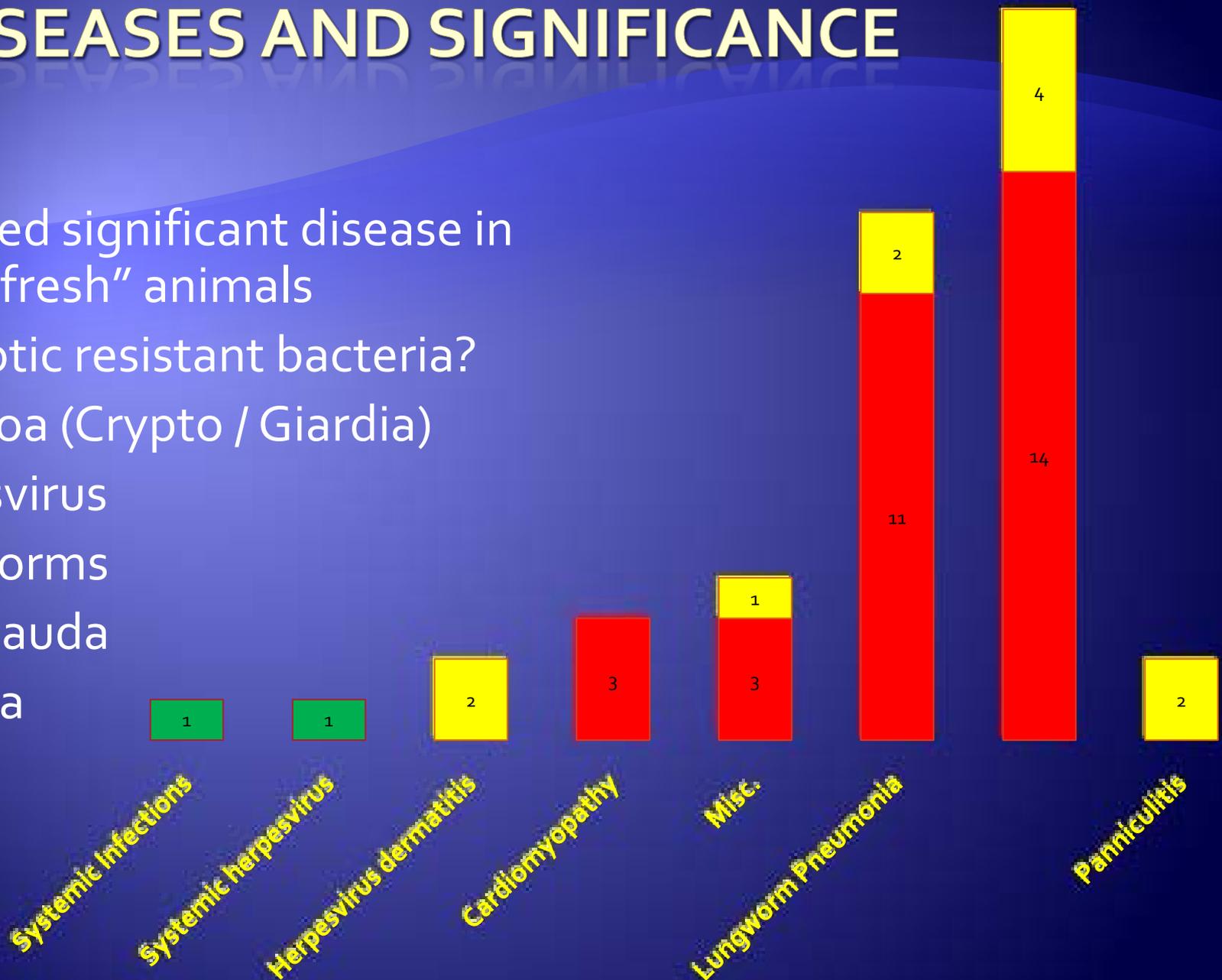
Protozoa (Crypto / Giardia)

Herpesvirus

Lungworms

Crassicauda

Brucella



# Acknowledge

- ◆ Teri Rowles, NMFS
- ◆ Jennifer Dushane and Ian Dickson - AVPS
- ◆ Chris Kaplan, T. McGuire - LGL
- ◆ Chris Garner – US Army
- ◆ Stranding network volunteers, boat drivers, pilots.



