



Baseline variation of steroid hormones in short-finned pilot whales



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ENVIRONMENT
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Short-finned pilot whale (*Globicephala macrorhynchus*)

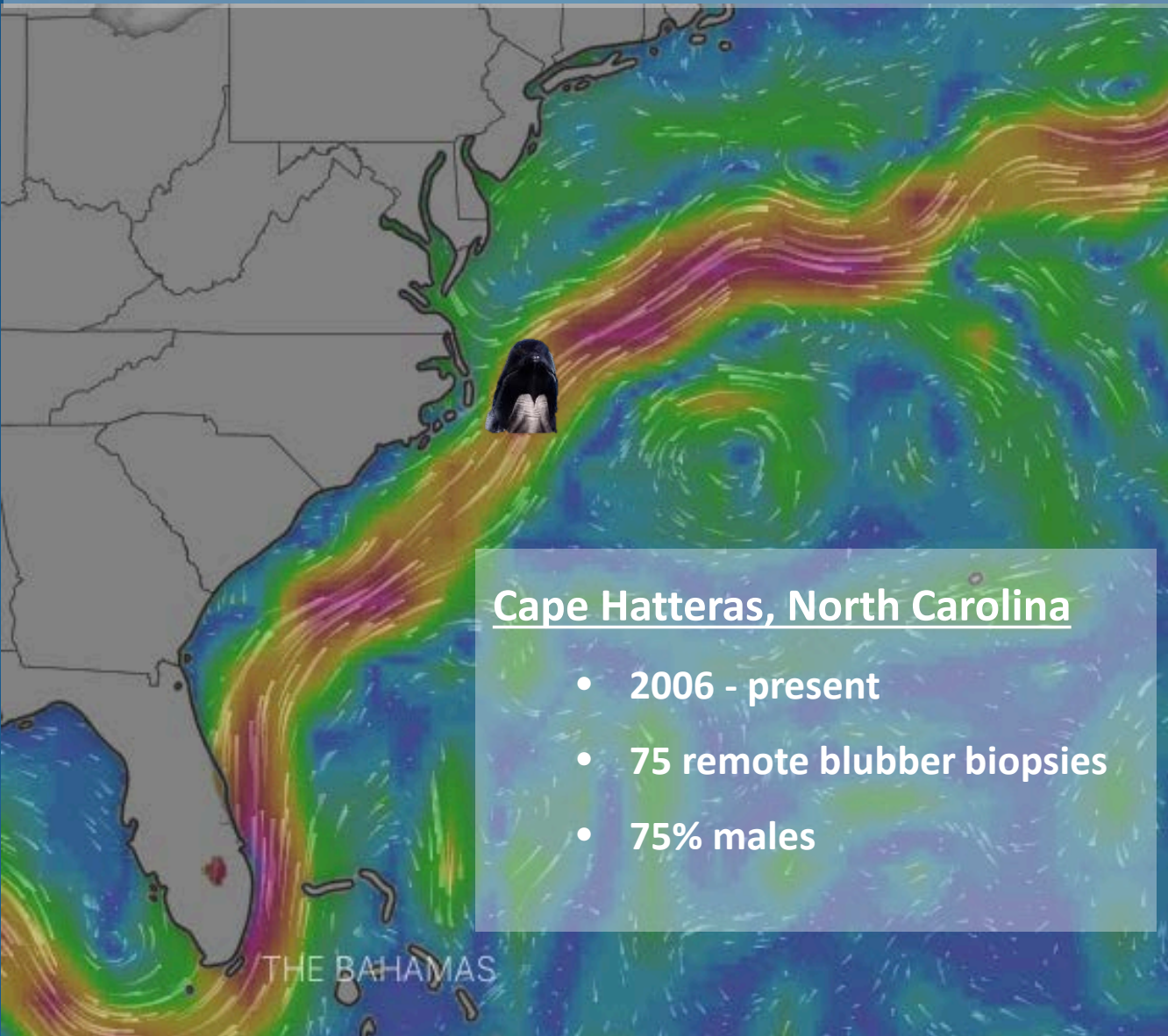


Cape Hatteras, North Carolina

- 2006 - present
- 75 remote blubber biopsies
- 75% males

THE BAHAMAS

Short-finned pilot whale (*Globicephala macrorhynchus*)

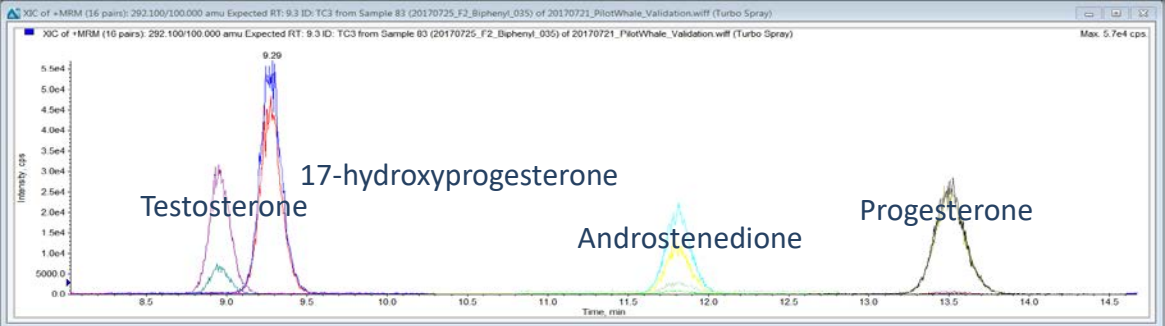


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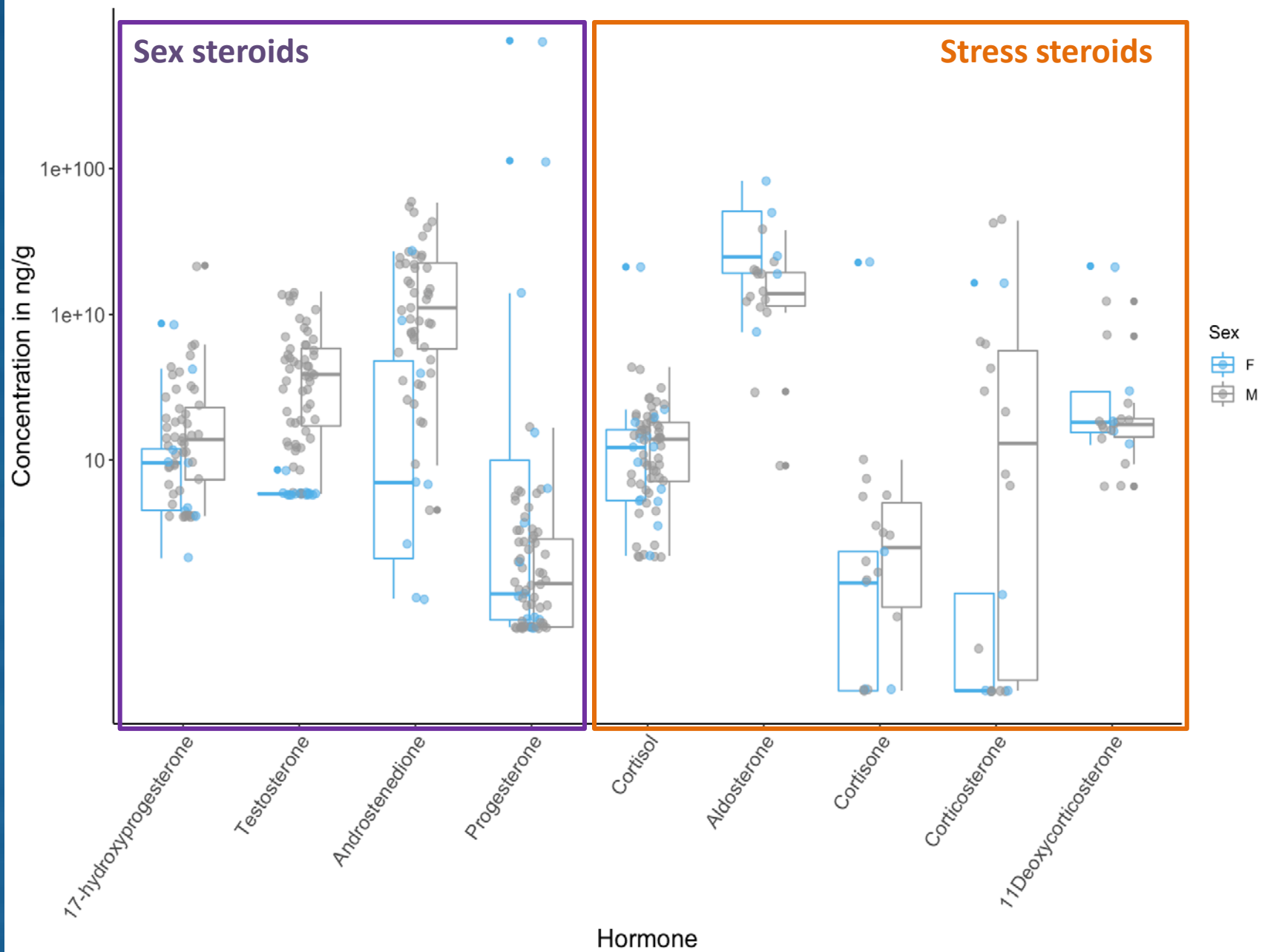
Liquid Chromatography Tandem Mass Spectrometry (LC-MS/MS)



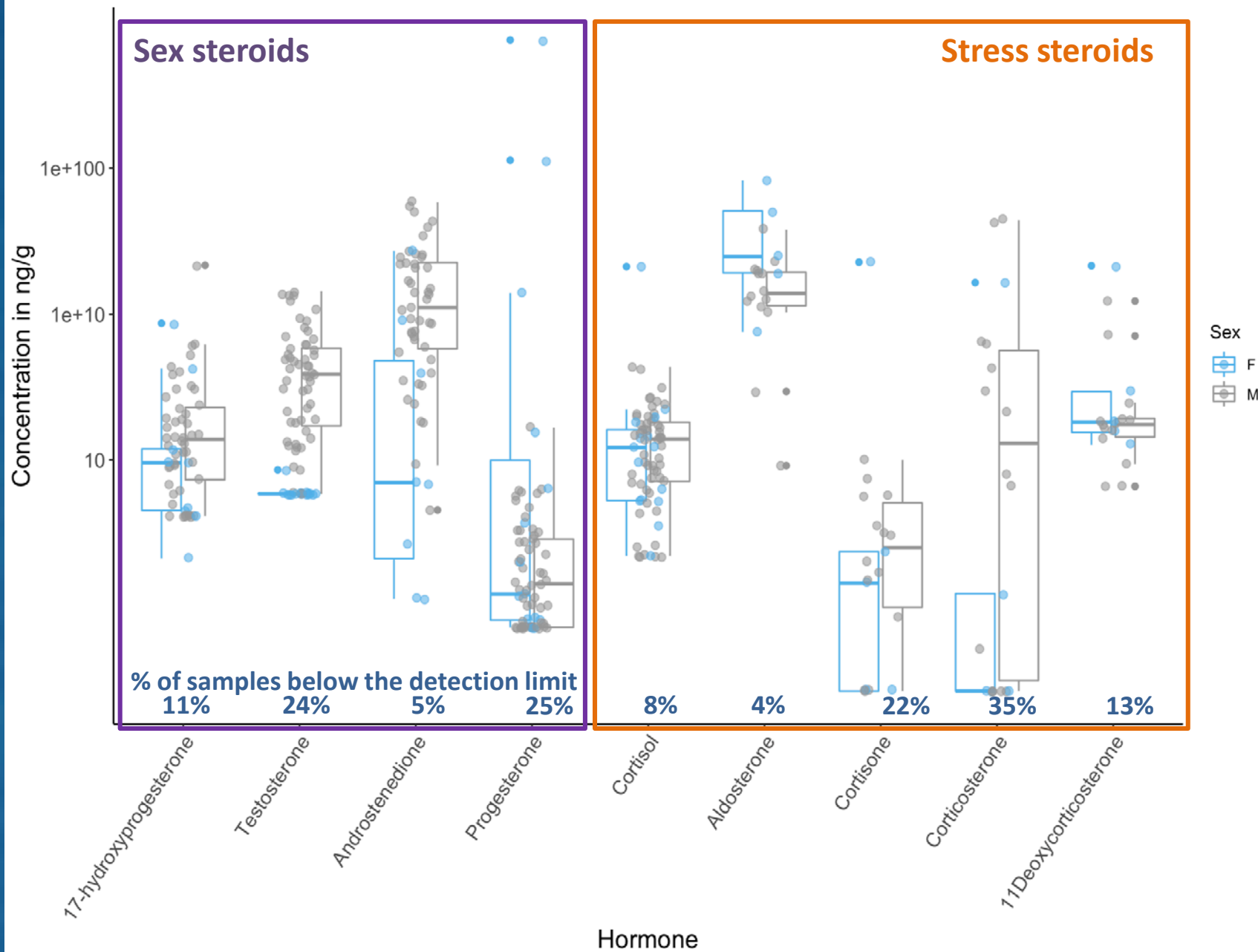
- 4 Sex Steroids (Biphenyl Column)
- 8 Stress Steroids (C18 Column)
- Dropped: 11deoxycortisol, DHEA , & DHEAS
- Matched internal standards



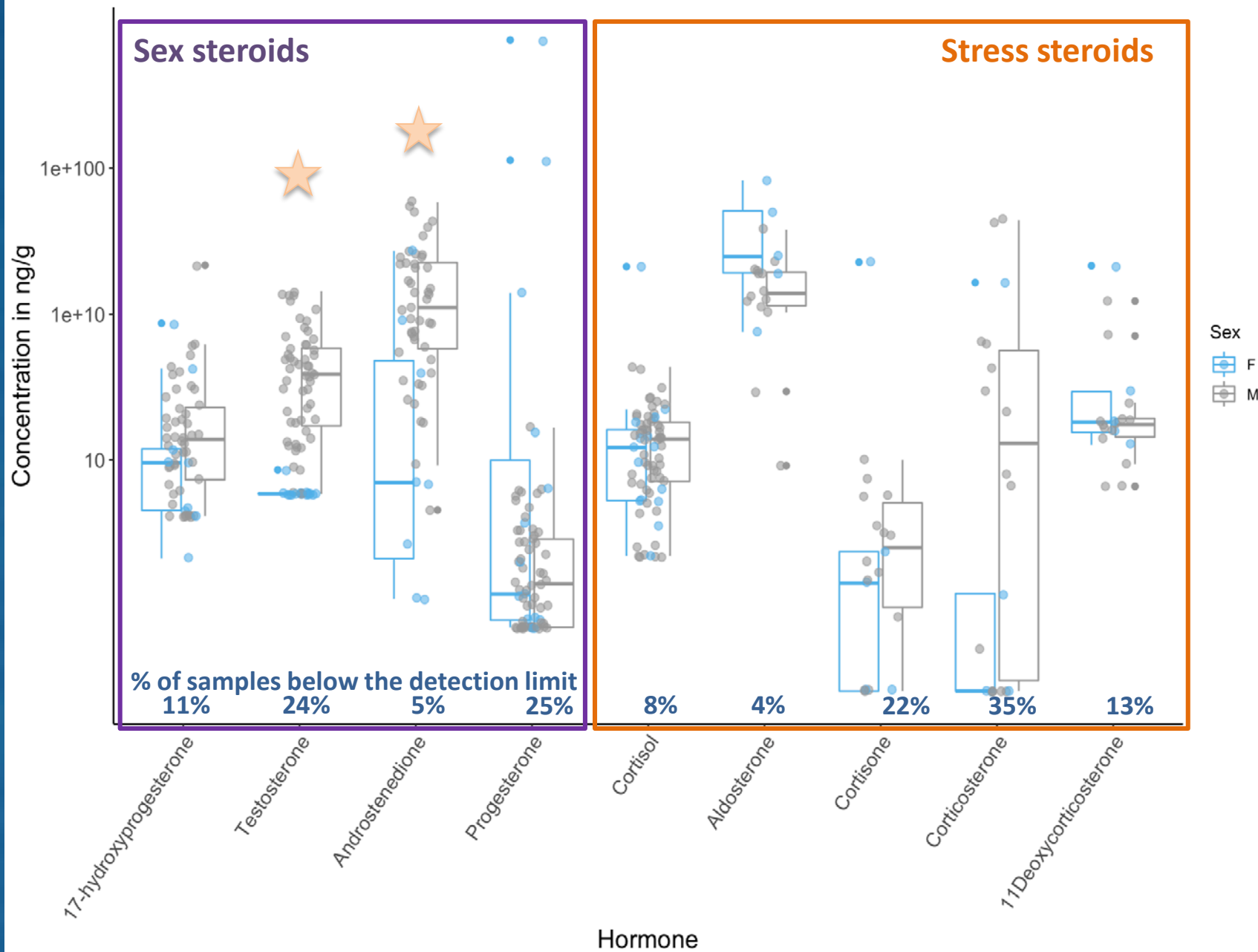
Concentrations of Steroid Hormones in Short-finned Pilot Whale Blubber



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Correlations between steroid hormones concentrations

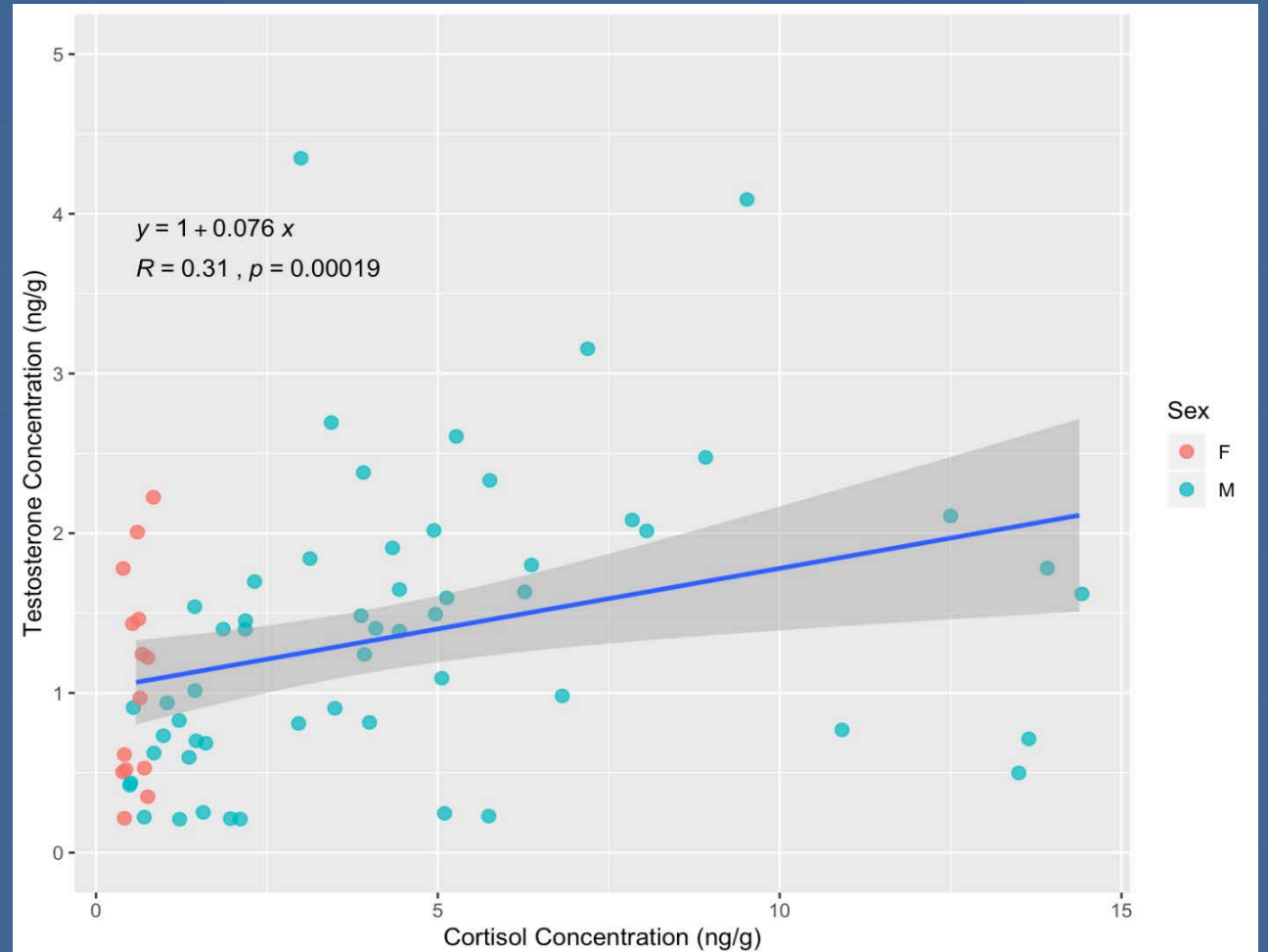
	Testosterone	Androstenedione	Progesterone	17-hydroxy progesterone	Cortisol	Cortisone	Corticosterone	11-deoxy corticosterone
Aldosterone					*			
11- deoxy corticosterone			**	*			**	
Corticosterone			*					
Cortisone								
Cortisol	***		*	*				
17-hydroxy progesterone	***	***	*					
Progesterone		**						
Androstenedione	***							

*** p < 0.001
 ** p < 0.01
 * p < 0.05

Correlations between steroid hormones concentrations

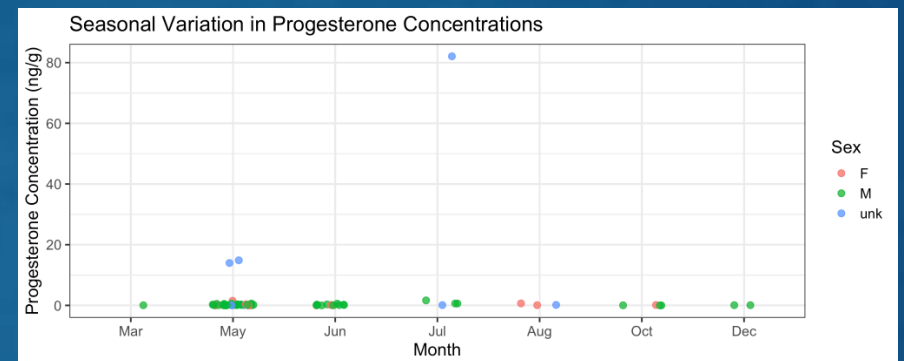
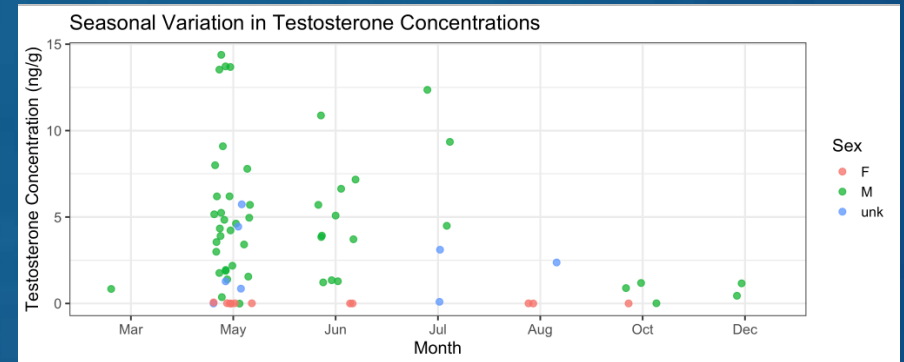
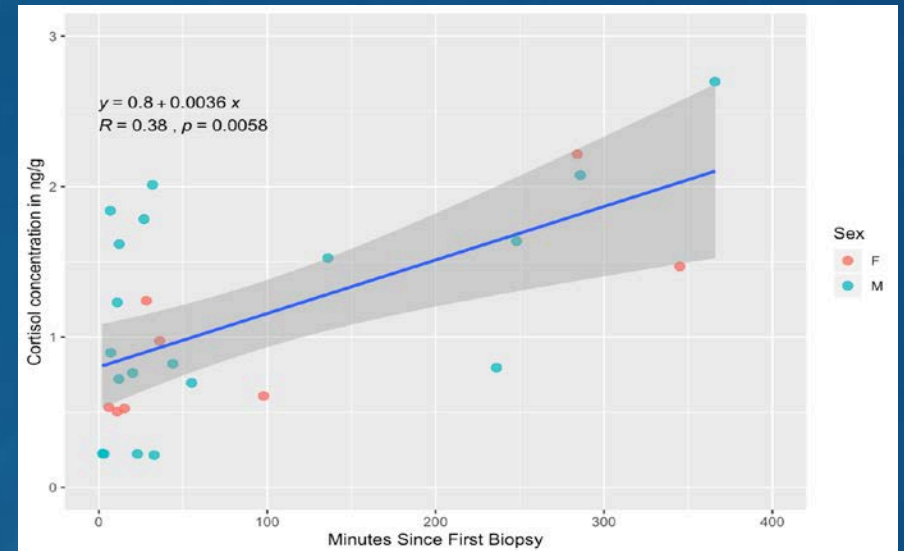
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11- deoxy corticosterone			**					
Corticosterone			*					
Cortisone								
Cortisol	***		*					
17-hydroxy progesterone	***	***	*					
Progesterone		**						
Androstenedione	***							

Cortisol vs. Testosterone



Applications & Future Directions:

- Understanding behavior and demography:
 - Breeding seasons
 - Reproduction rates
- Setting up for stress response studies
 - Primary stress hormones
 - Baseline references
 - Blubber time lag
 - Contextual models that include sex, reproductive status, etc.



Acknowledgments

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Heather Foley
Zach Swaim
Danielle Waples
Andy Read
Doug Nowacek

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