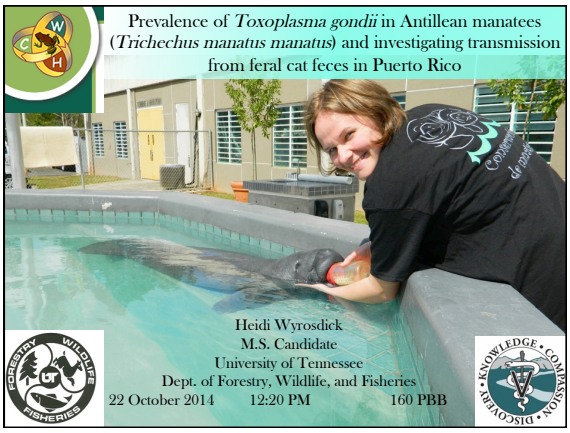
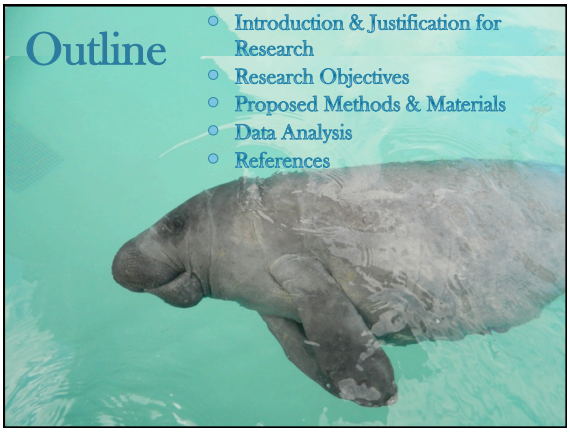
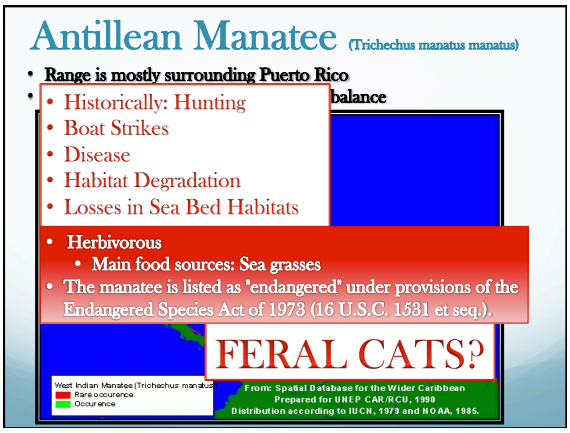
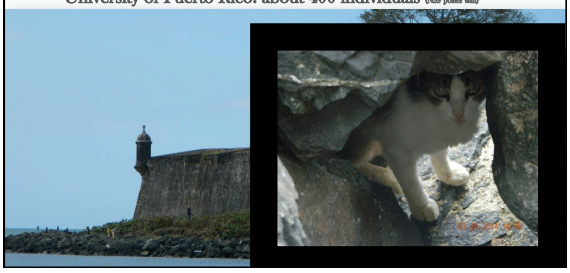

Prevalence of *Toxoplasma gondii* in Antillean manatees (*Trichechus manatus manatus*) and investigating transmission from feral cat feces in Puerto Rico
Heidi Wyrosdick
M.S. Candidate
University of Tennessee
Dept. of Forestry, Wildlife, and Fisheries
22 October 2014 12:20 PM 160 PBB


Outline
Introduction & Justification for Research
Research Objectives
Proposed Methods & Materials
Data Analysis
References


Antillean Manatee (Trichechus manatus manatus)
Range is mostly surrounding Puerto Rico
balance
Historically: Hunting
Boat Strikes
Disease
Habitat Degradation
Losses in Sea Bed Habitats
Herbivorous
Main food sources: Sea grasses
The manatee is listed as "endangered" under provisions of the Endangered Species Act of 1973 (16 U.S.C. 1531 et seq.).
FERAL CATS?
West Indian Manatee (Trichechus manatus
Rare occurence
Occurence
From: Spatial Database for the Wider Caribbean
Prepared for UNEP CAR/RCU, 1999
Distribution according to IUCN, 1979 and NOAA, 1985.

Feral Cat Populations

- Save the Gato: estimates 250 individuals
- University of Puerto Rico: about 400 individuals (NSF poster wall)

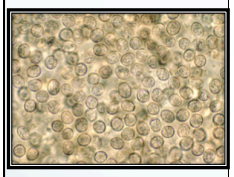


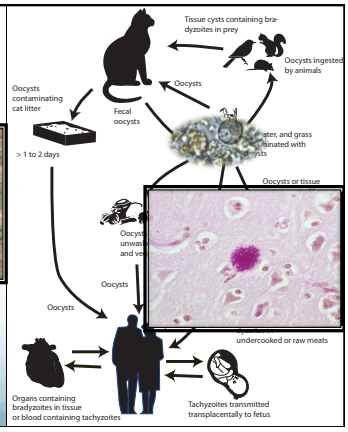
A cat and Its Parasite

- Etiological agent: *Toxoplasma gondii*
- Disease: Toxoplasmosis
- Classification:
  - Eukaryotic Protozoan
    - Subphylum:Apicomplexa
    - Subclass: Coccidia
- Intestinal parasite of felids
- DH: Wild and Domestic Felids
- IH: All Mammals and Birds (Assadi-Rad *et al.*, 1995)
- Human Health Threat (US: 1/3 of Population) (CDC Website: Parasites)

The Parasite

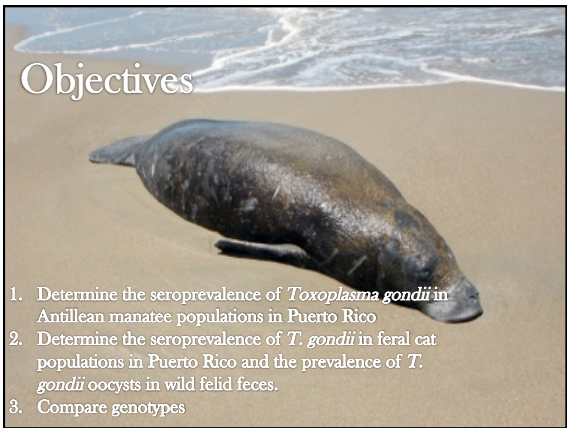
Toxoplasma gondii






FRESHWATER RUNOFF
SLIME?!


Justification
Sporulated Oocyst
Manatee


Objectives
1. Determine the seroprevalence of *Toxoplasma gondii* in Antillean manatee populations in Puerto Rico
2. Determine the seroprevalence of *T. gondii* in feral cat populations in Puerto Rico and the prevalence of *T. gondii* oocysts in wild felid feces.
3. Compare genotypes

Methods and Materials

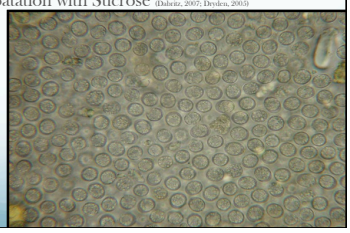
- Sampling: Manatees
  - Live Animals:
    - Health assessment study by the Manatee Conservation Center of Puerto Rico
      - Serum collection (+ blood clot)
  - Deceased Animals:
    - Opportunistic Collection of:
      - Serum and blood pooled around heart
      - Heart
      - Brain
      - Tongue
      - Instestine
      - Pancreas
      - Milk

Methods and Materials

- Sampling: Felids
  - 1mL of Serum (+blood clot)
  - 4 grams of Feces

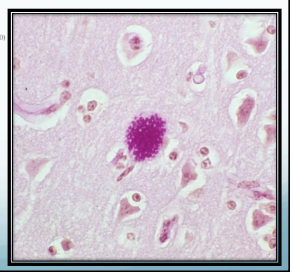
Material and Methods

- Screening
  - MAT (Modified Agglutination Test) (Desmonts and Remington, 1980; Dubey and Desmonts, 1987)
    - All serum samples
    - IgG>/=32
  - Centrifugal Fecal Floatation with Sucrose (Dubeitz, 2007; Dryden, 2005)
    - All fecal samples
    - Oocysts Shedding



Material and Methods

- PCR (Polymerase Chain Reaction) (Homan *et al.* 2000)
  - All tissues
  - Determine tropism
- Bioassay and Genotyping (Su *et al.* 2010)
  - All fresh Heart Samples
  - Blood clot in live clinical animals



Data Analysis

- Prevalence data will be analyzed by logistic regression with AIC to evaluate whether transmission of *T. gondii* is driven by sex, age or location.
- Seroprevalence of *T. gondii* in manatees and felids will be determined based on MAT results
- Descriptive/Comparative analysis of genotypes

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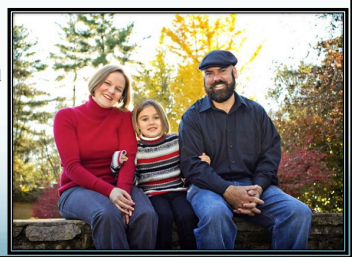
- Aly Chapman: Parasitology Lab
- Family
- Committee
  - Dr. Debra Miller
  - Dr. Richard Gerhold
  - Dr. Chunlei Su
- CWH
  - Dr. Rachel Hill



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- Bossart et al. 2012, provided by Antonio Mignucci
- Photo courtesy of Dr. Lucio-Forster, Cornell University
- Life cycle courtsey of Greg Schweiger
- Photos of parasite stages courtsy of UTCVM: Parasitology Lab
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