

# Mosquito Control in Florida

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# Mosquitoes



- **Over 3,500 species worldwide (80 in FL)**
  - **Breed in almost every known aquatic habitat**
    - **EXCEPT** very swift currents and open bodies of water
  - **Biology of each species is unique**
    - Larval habitat
    - Host preferences
    - Flight ranges
    - Differences in appearance (morphological differences)
    - Temperature tolerances



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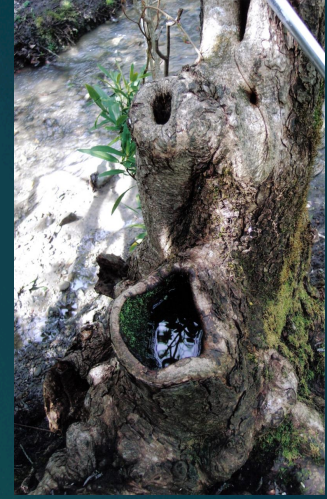


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# Mosquitoes in Florida



- Larvae inhabit a wide variety of aquatic habitats

- Freshwater swamps and marshes
- Salt marshes
- Mangrove swamps
- Drainage ditches
- Lakes (grassy margins)
- Crab holes
- Tree holes
- Floodwater pools
- Artificial containers
- Pastures
- Citrus furrows



- Constitutes enormous potential area for production in FL!





# Florida's Ecology

- Warm climate
- Regular rainfall
- Endemic disease vector species
- Suitable amplification hosts (migratory birds)
- Historical disease presence
  - Prime for introductions of exotic diseases & invasive mosquito species

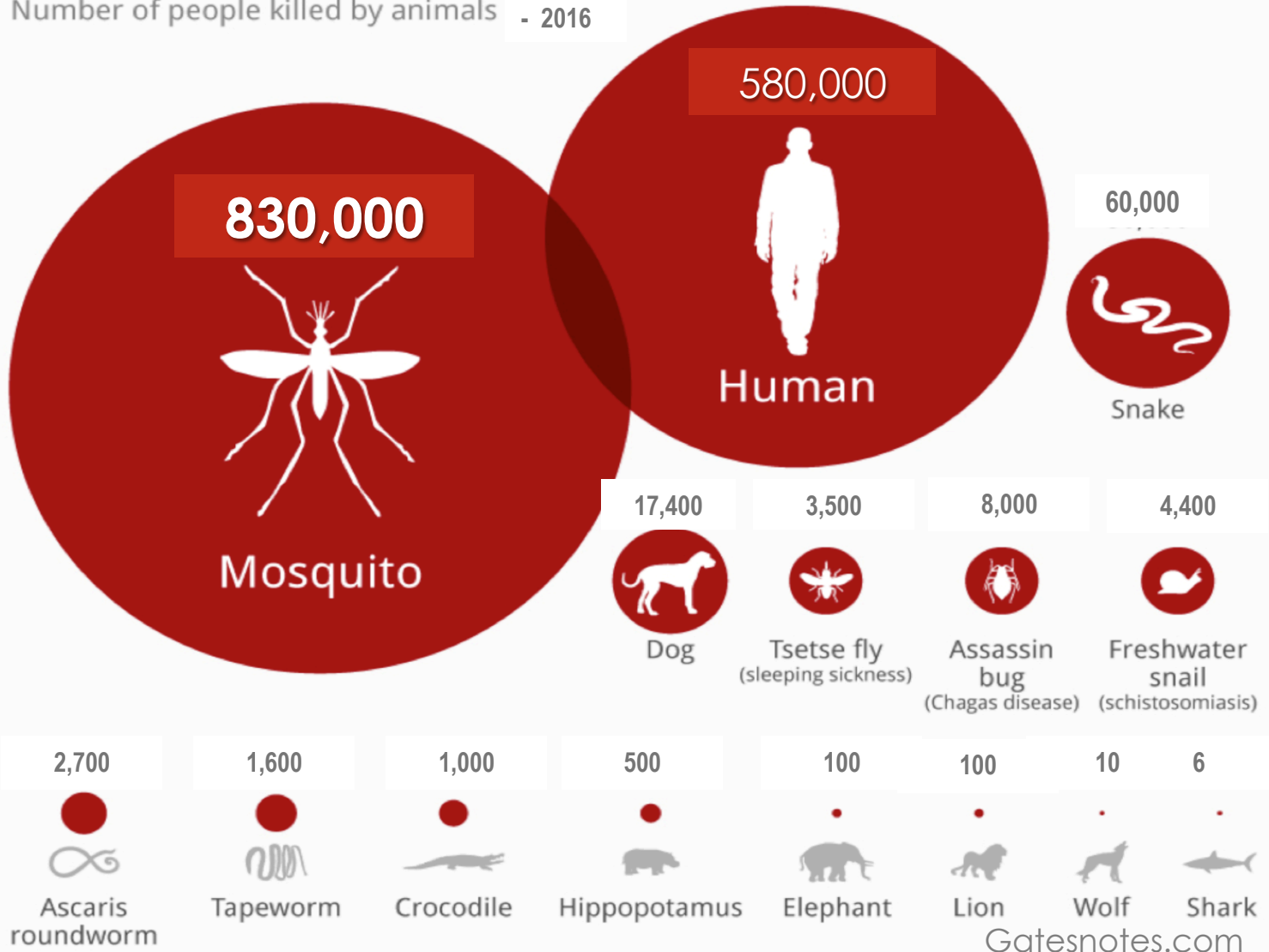




# Mosquitoes - at best an annoyance - at worst vectors of deadly diseases

## The World's Deadliest Animals

Number of people killed by animals - 2016





# History of Illness in Florida

- As little as 100 years ago life was unbearable
  - Pestilence and mosquito-borne disease raged
- Congress debated merits of statehood
  - Florida could never be developed, nor would it ever be a fit place to live - John Randolph (VA)
    - “Land of swamps, of quagmires, of frogs and alligators and *mosquitoes.*”



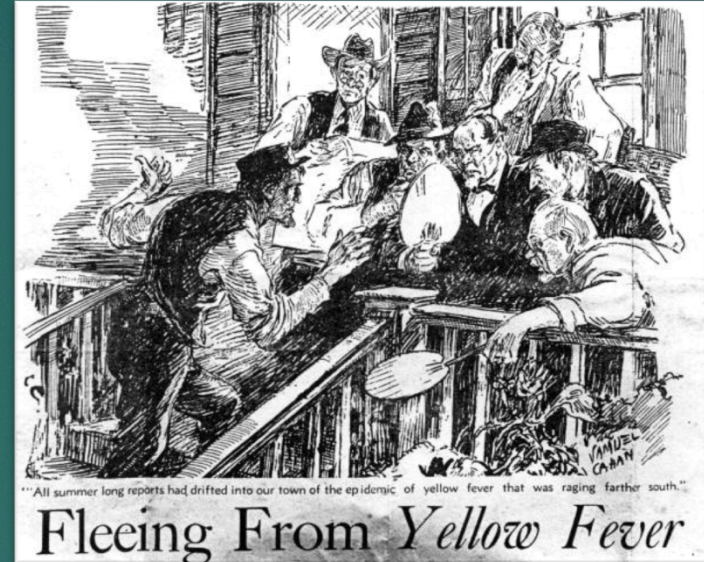






# History of Illness in Florida

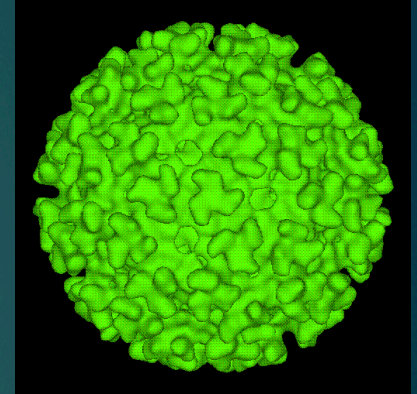
- **Malaria Belt**
  - Jacksonville, St. Augustine, Tallahassee, and Pensacola
- **1877 Yellow fever epidemic**
  - Jacksonville and Fernandina Beach
  - “The State's worst holocaust”
- **1887 Yellow fever epidemics**
  - Key West, Tampa, Plant City, and Manatee
- **1888 Yellow fever epidemic**
  - Jacksonville - 10,000 people fled (Duval County population 26,700)
- All of that has changed thanks to **mosquito control!**





# Florida Arboviruses

- RNA viruses in 2 genera
  - *Flavivirus*
    - West Nile virus (WNV)
    - St. Louis encephalitis virus (SLEV)
    - Dengue virus (DENV)
    - Zika virus (ZIKV)
  - *Alphavirus*
    - Eastern equine encephalitis virus (EEEV)
    - Chikungunya virus (CHIKV)



- Filarial disease  
Dog heartworm





# Supporting FL Mosquito Control

## FDACS Mission

- **Provide regulatory framework for mosquito control programs**
  - Licensing
  - Certification
  - Pesticide registration and application
- **Administer pass through funding from FL Legislature**
  - Aid to local government
  - Competitive grant process for applied mosquito control research
- **Provide science based technical assistance**
- **Conduct statewide emergency mosquito control**





# Regulatory Authority







## Ch. 388, Florida Statute, Mosquito Control Law

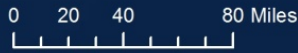
*...to achieve and maintain such levels of arthropod control as will protect human health and safety and foster the quality of life of the people...*





# Mosquito Control Programs in Florida

-  State-approved programs
-  State-approved programs that are split county programs
-  Counties without a state-approved program
-  Counties that contain a program that is not state-approved
-  Headquarter location of program
-  Aerial program capability



Fort Myers Beach

Amelia Island

East Volusia

# Capabilities Widely Varied



Created by Shalom Siebert



# Integrated Mosquito Management

Controlling mosquitoes in FL requires a fully comprehensive **IMM** regime

- Public education
- Source reduction
- Habitat manipulation
- Surveillance
- Larviciding
- Adulticiding
- Resistance Monitoring





# Methods of Mosquito Control



- **Biological control**
  - *Gambusia* species
- **Physical control**
  - Land and water management
    - Impoundments
    - Mosquito ditching
- **Source reduction/premises sanitation**

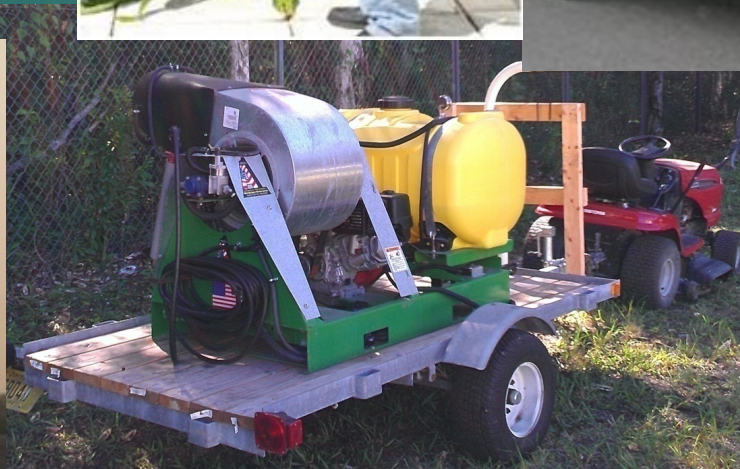
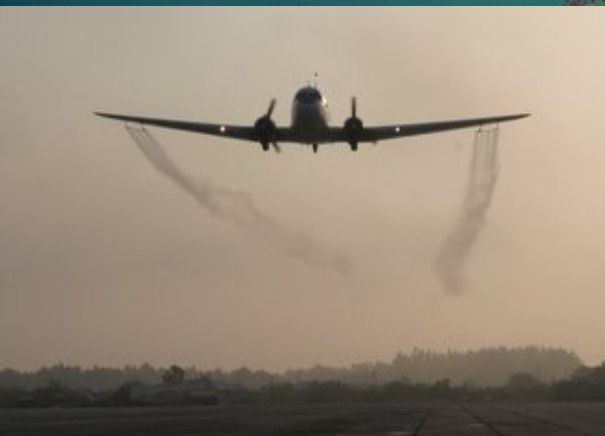




# Methods of Mosquito Control

## Adulticiding

- Air & Ground
  - Handheld, backpack, ATV-mounted, truck-mounted
    - ULV
    - Barrier
    - Thermal





# Methods of Mosquito Control

## Larviciding

- Air & Ground
  - Liquid
  - Granular
  - Tablets





# Surveillance

- Defines the nature and extent of problem
  - Species distribution and abundance
- Demonstrable increase in mosquito populations required;  
5E-13.036, F.A.C.
  - Quantifiable increase (or sustained elevation) over base line populations
  - >25 adult mosquitoes/trap/trap night
  - Service requests from public verified





# Thank you!

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