



Arboviral Disease Prevention & Management in the Florida Keys

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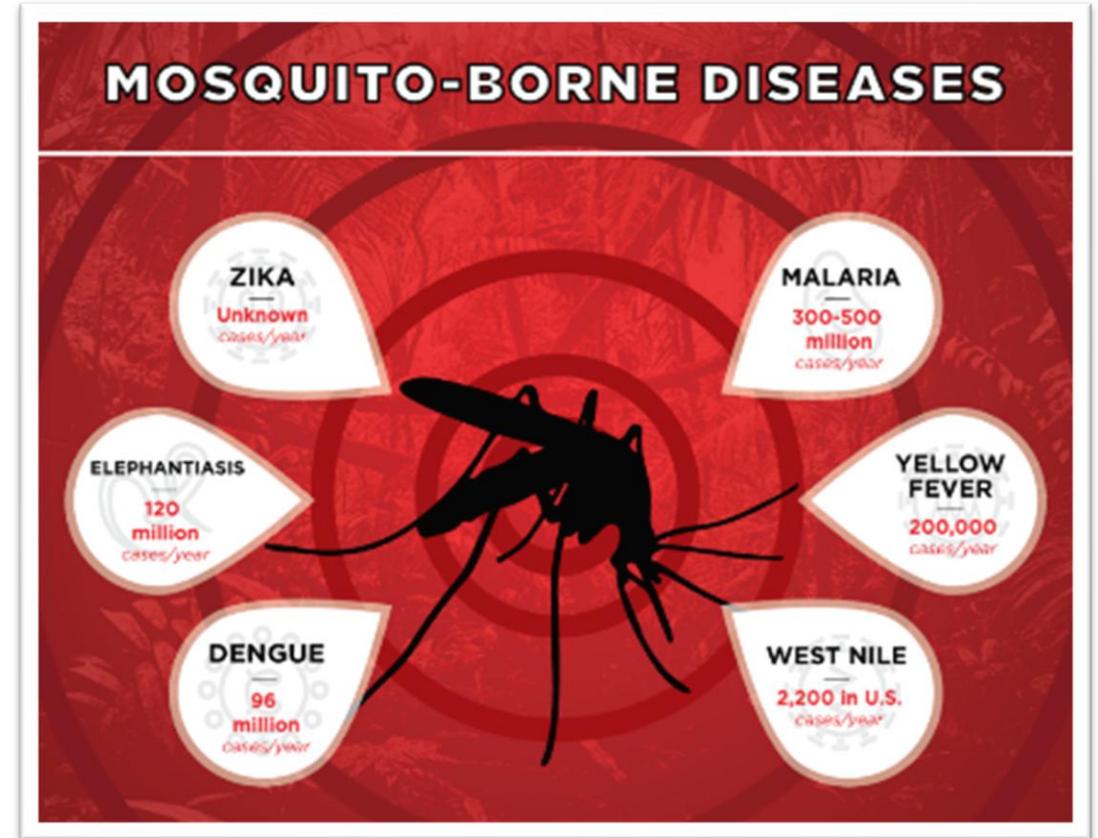
Executive Director

Florida Keys Mosquito Control District



A Shared Challenge

- **Scientists:** generating and interpreting evidence
- **Policy makers:** enabling action and funding
- **Public & communities:** participation and trust
- **Effective control happens where these intersect**



Why the Florida Keys?

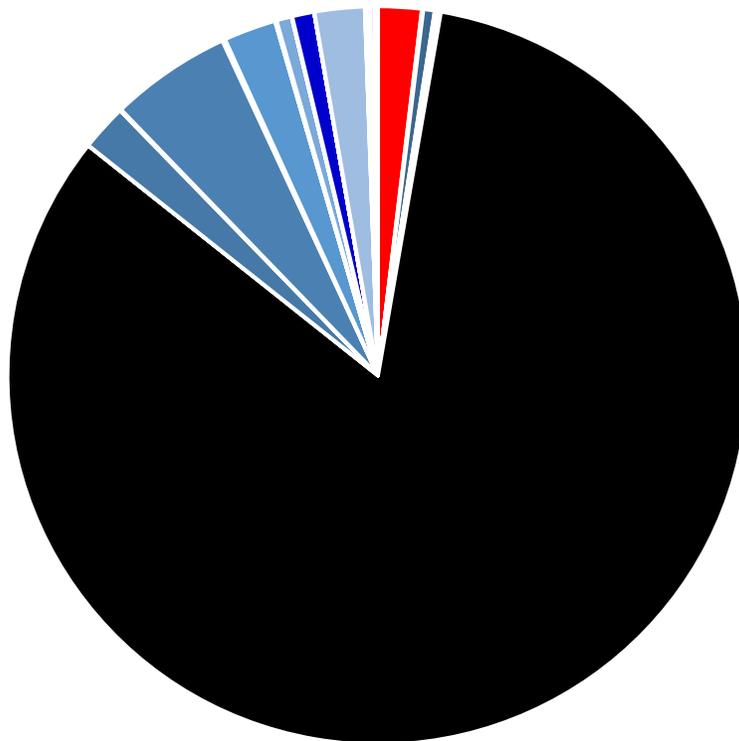


- Recurrent risk of dengue and other arboviruses
- Urban, suburban, and mangrove environments
- *Aedes aegypti*: small population, large impact



Mosquitoes of the Florida Keys

(Total female mosquitoes trapped 2020-2024, n = 5,997,741)



***Aedes aegypti* (2%)**

***Aedes taeniorhynchus* (83%)**

***Culex quinquefasciatus* (1%)**



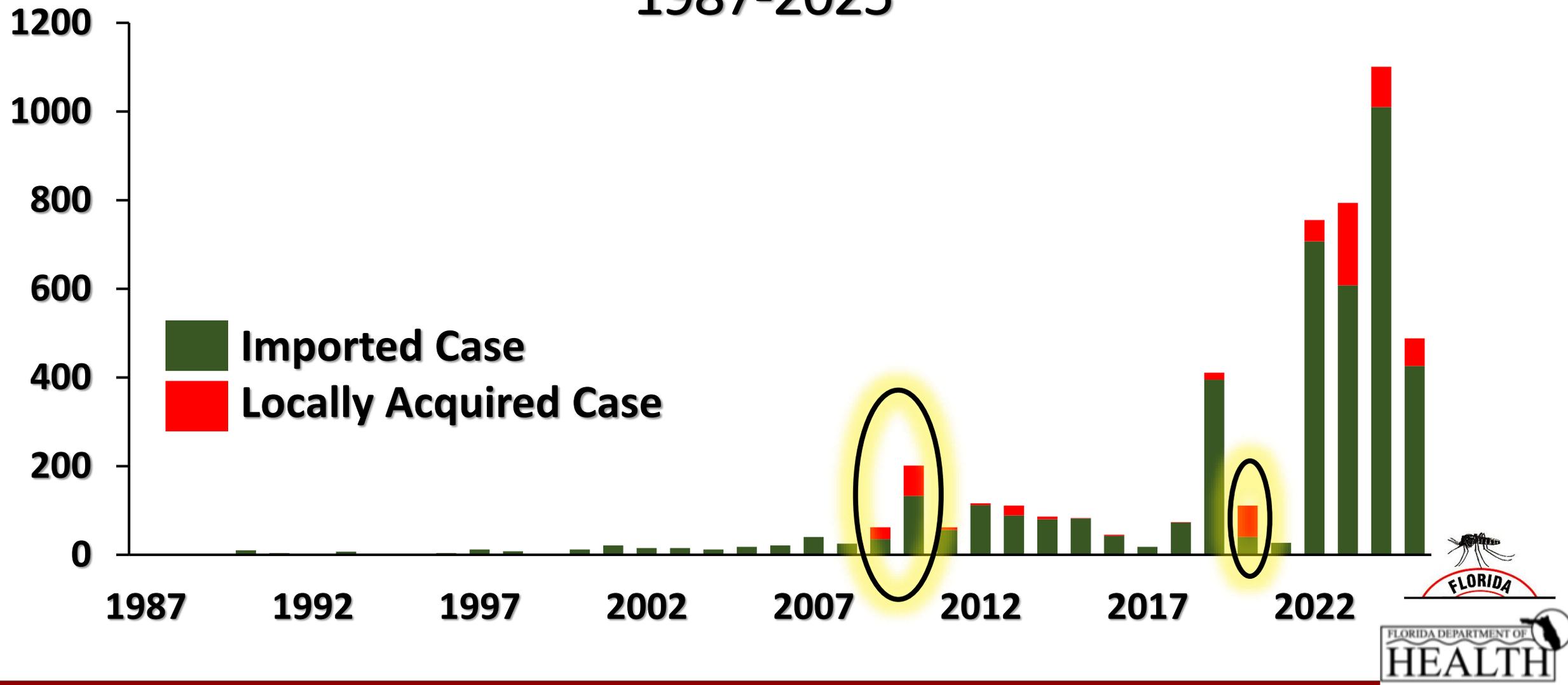
Aedes aegypti



Photo: fme1.ifas.ufl.edu

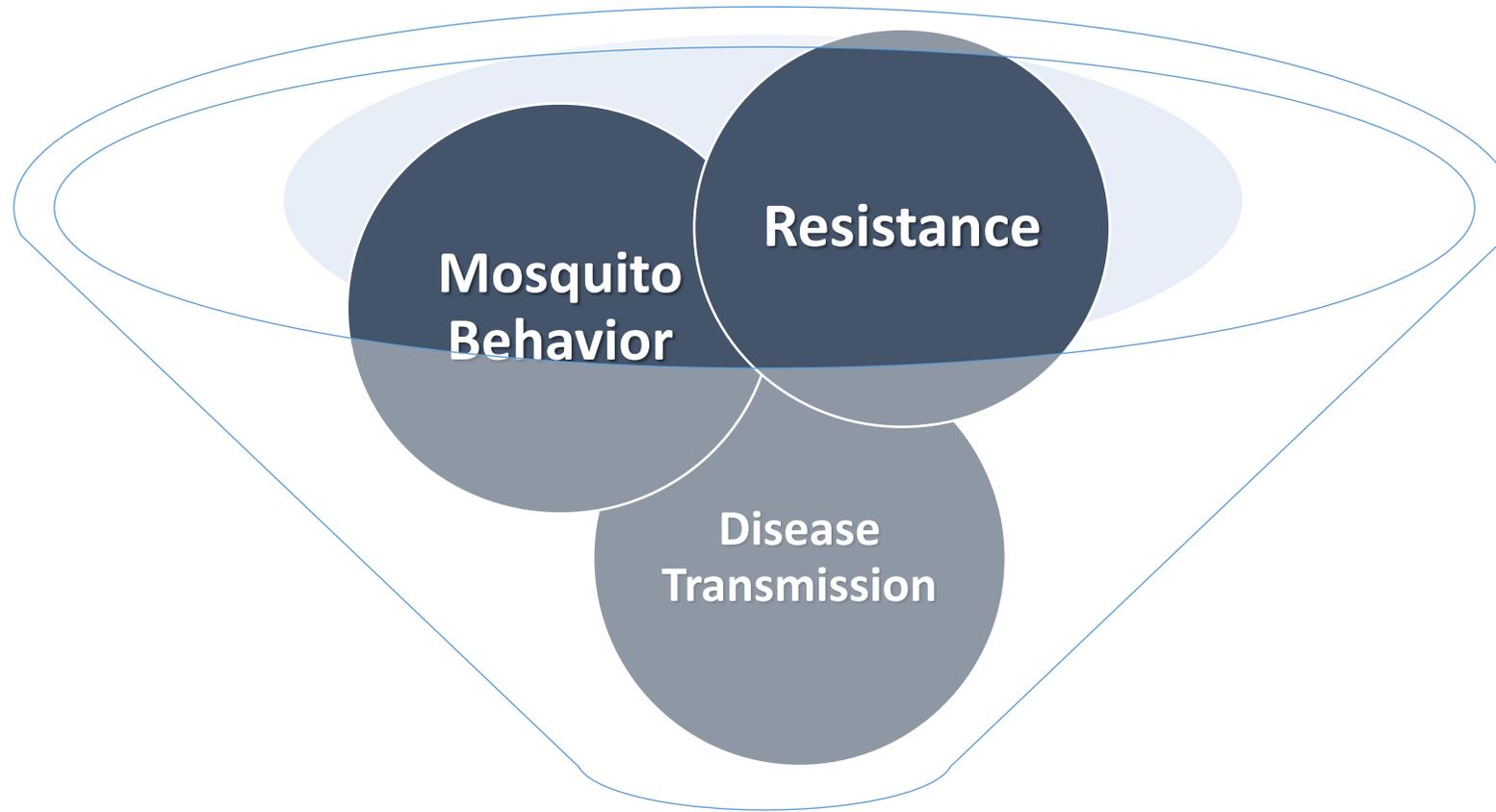


Dengue Cases in Florida 1987-2025



Current *Aedes aegypti* Control Measures





**Need for New
Tools**



Liquid Application of *Bacillus thuringiensis israelensis*

- Rapid coverage of large areas
- Treat cryptic containers
- Target specific
- Visible efficacy
- Non-intrusive for residents
- Previously used in forestry



Working with *Bti* in the Air

- **Hidden Cups (2011)**
 - 70% control of larvae
- **Container Indices (2012)**
 - 58% control, day after treatment
- **Adult Control (2013)**
 - 50% control of adults
- **Large/Small Container Study (2014)**
 - No Significant Difference



Operational Applications: Easily Scalable by Air

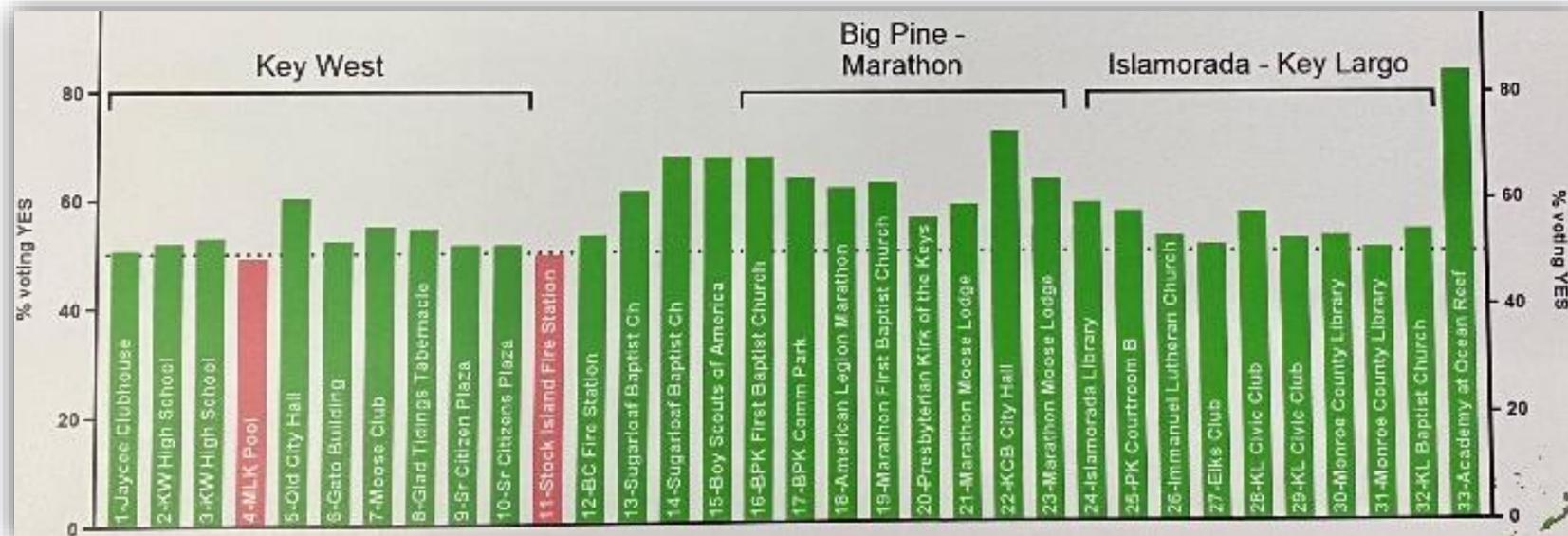


- **Treatments conducted weekly over Key West**
- **Truck mission conducted after rainfall in areas of concern**
- **Additional aerial missions conducted for disease response**



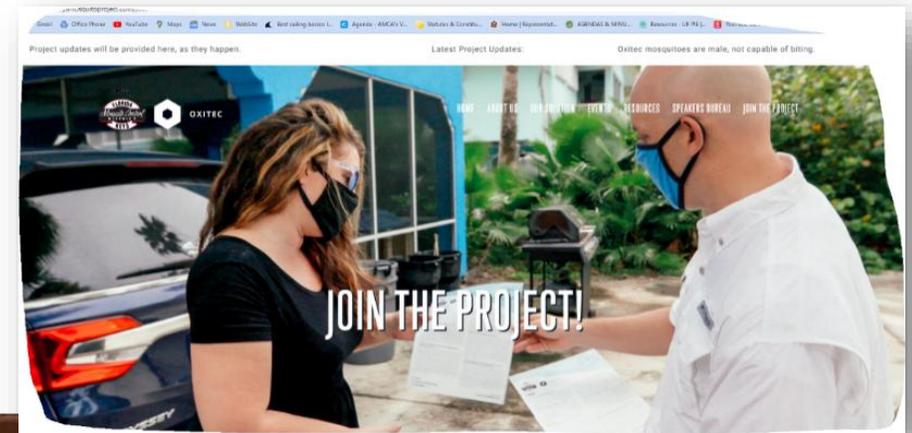
FKMCD-Oxitec Project Timeline

- 2010: Conversation/Collaboration Begins
- 2010 – 2015: Jurisdictional questions
- ~2015: FDA Takes Oversight
- 2016: Local Voter Referendum
- 2017: EPA Takes Oversight
- 2020: EPA, FDACS, and FKMCD Board Approvals
- 2022-2023: Trials Conducted Under Experimental Use Permit



Know Your Audience

- **Communication Survey Online**
 - What do you know about the project?
 - How do you get your information?
- **Focus our Message and Reach More People**
 - Weekly Radio Spots
 - Printed mail materials
 - Dedicated website
 - www.keysmosquitoproject.com
- **Monthly Webinars throughout Project Timeline**





Project Elements

Evaluation Elements

1. Male flight range and longevity
 - Same as wild *Ae. aegypti*
2. Duration of effect (residual activity)
 - Once releases ended, no genes detected after a few months
3. Evaluation of natural breeding sites
 - Were found in cryptic habitats
4. % kill of female mosquitoes
 - Larvicidal efficacy 100%
5. Neighborhood suppression
 - Reduction seen in release areas



How Do We Scale These Technologies?



- **Mass Rearing Facilities**
- **Shipping**
- **Distribution Through Treatment Areas**
 - **Box vs. Adults**
 - **Hand**
 - **Vehicle**
 - **Drone?**
 - **Aircraft?**



Key Takeaways

- Evidence must guide action
- No single tool is sufficient
- Community trust shows up in outcomes
- Collaboration is the real force multiplier

