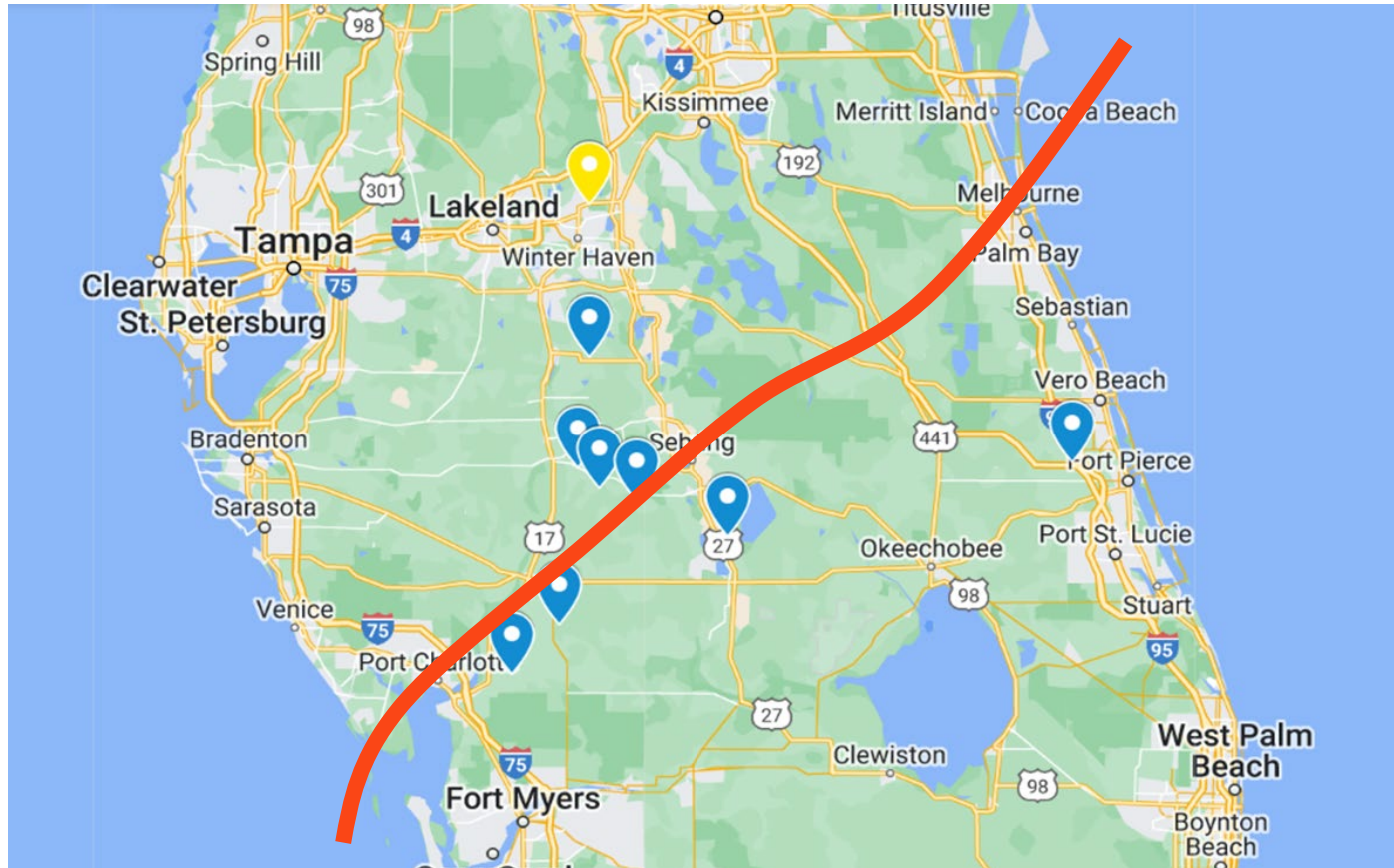


# How bad is it?

Mitigating the effects of hurricanes on citrus trees

Christopher Vincent and Zeng Michalczyk

# Lessons from Hurricane Ian



**G. Zeng Michalczyk:**  
**MS Student**



# Main points

- Different windspeeds cause different kinds of damage.
- Damage from high windspeeds persists for months to years.
- Water is key to mitigating post-storm stress.
- Canopy recovery is important for Category 3+.
- We won't cover flooding, but this is just as important as wind damage.



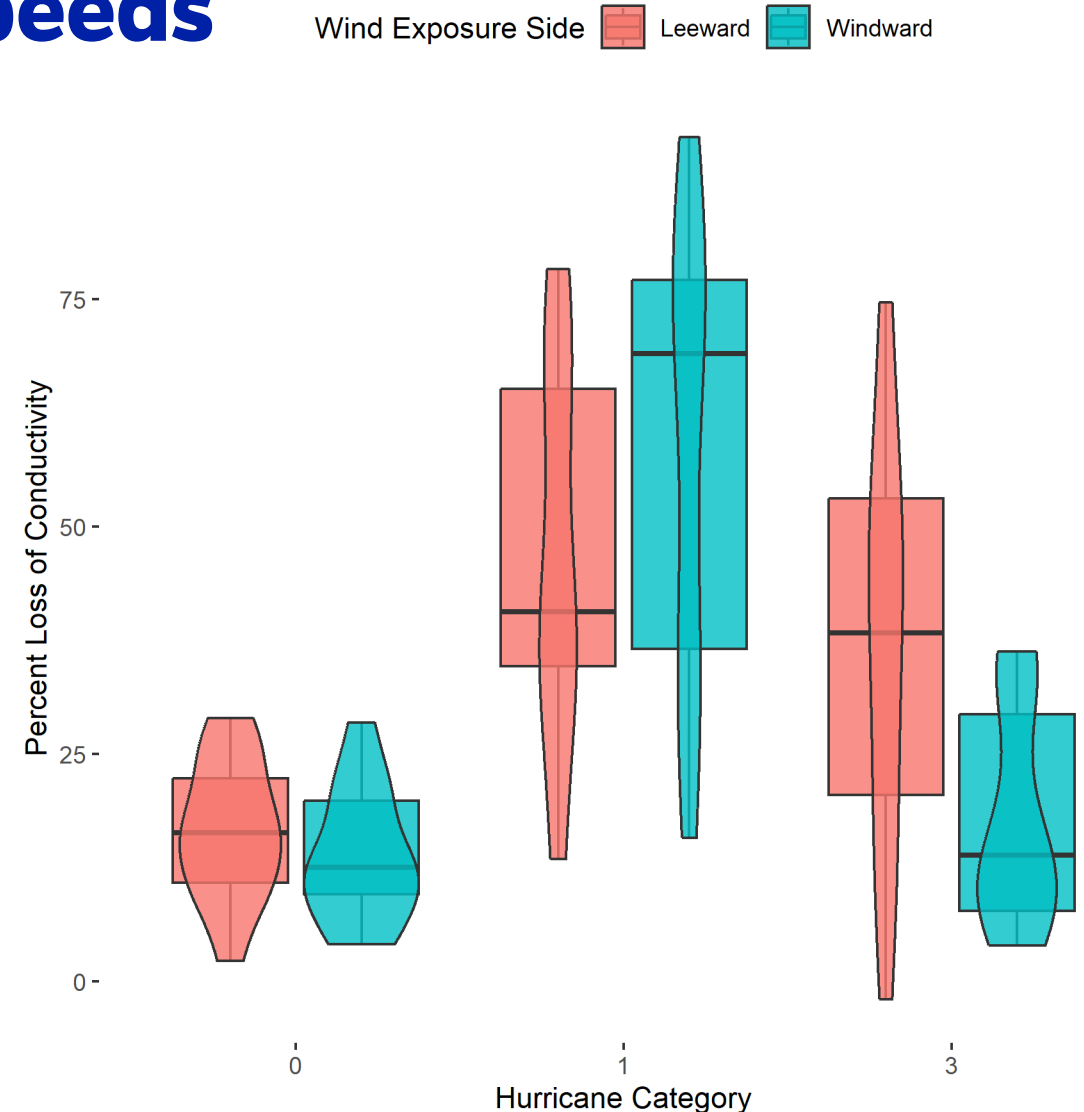
# Different windspeeds

- Category 1
  - Branch strain but minimal defoliation.
  - Initial fruit drop moderate (continues after storm).
- Category 3
  - Branch and limb breakage.
  - Dramatic defoliation.
  - Dramatic fruit drop.
- Why don't we have category 2 here?



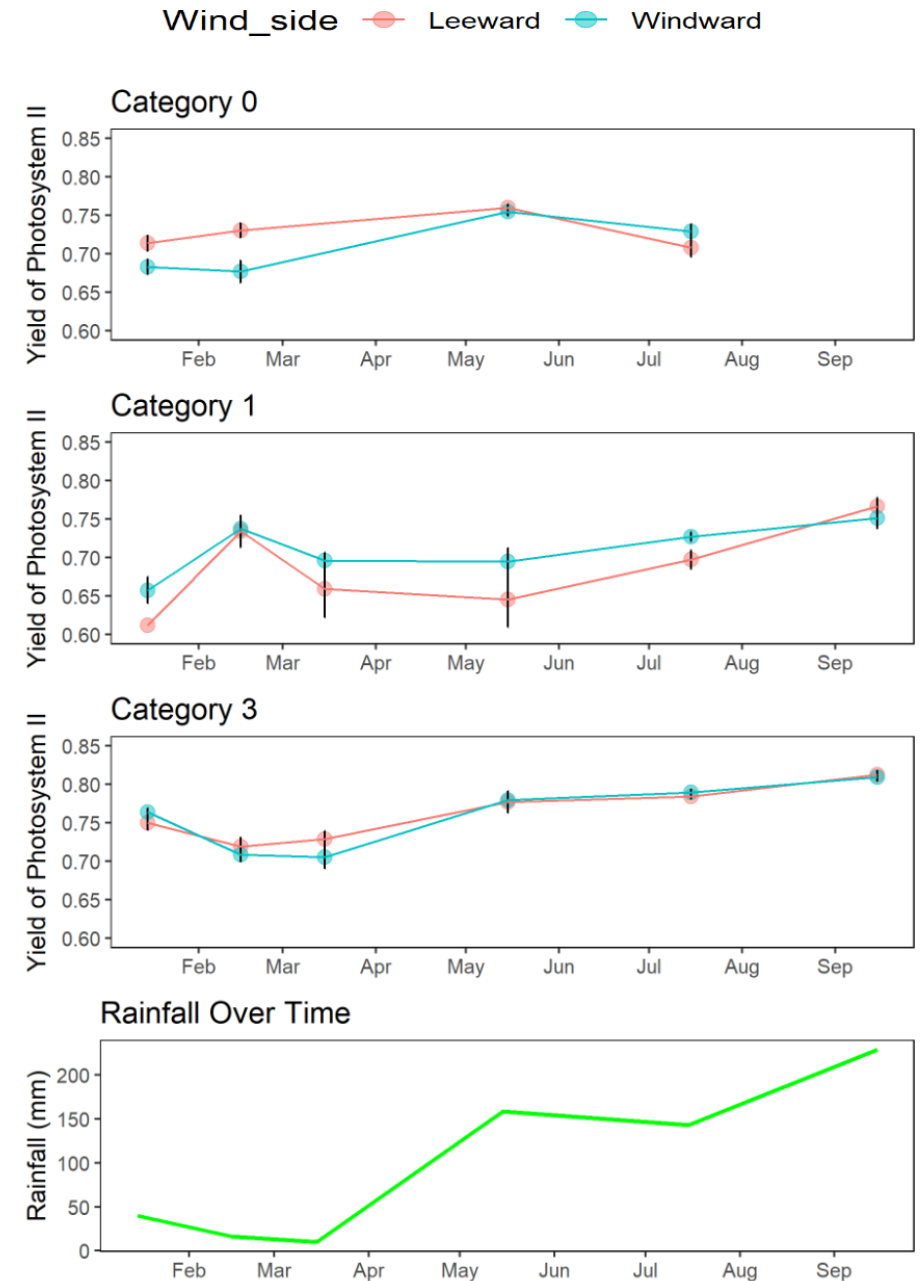
# Damage from different windspeeds

- Category 1
  - Hinders water transport to remaining leaves.
  - Trees are more sensitive to water deficits in the dry season (like HLB, but moreso).
- Category 3
  - Branch and limb breakage, canopy loss.
  - Remaining branches have better water transport than those of Cat 1 trees.
- What are we missing?: roots



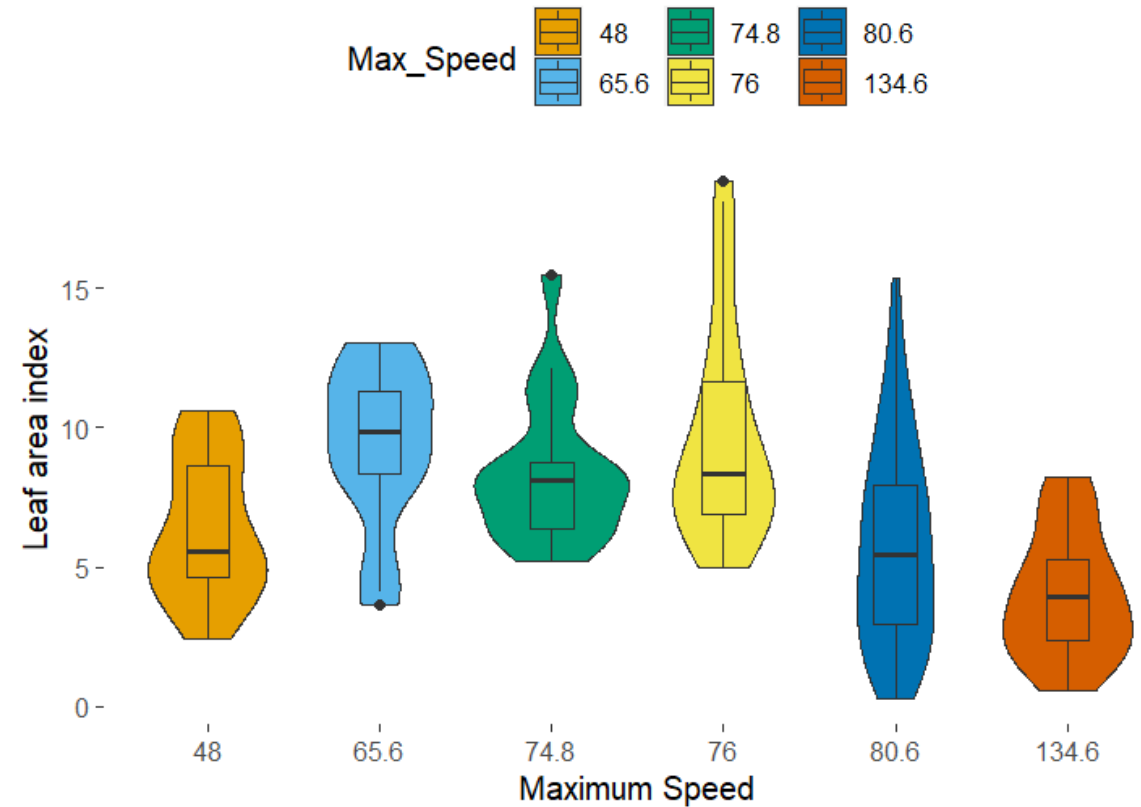
# Recovery timeline from different windspeeds

- Category 1
  - Recovers leaf health after rainy season resumes (eg. 9-12 months later)



# Recovery timeline from different windspeeds

- Category 3
  - Canopy loss still evident 15 months after storm.



# What can we do to recover better/faster

- Category 1
  - Water is key:
    - Supply: Frequent irrigation in small doses.
    - Demand: Particle films reduce water demand/stress.
- Category 3
  - Canopy recovery is key:
    - Maintain supply of water and nutrients (uptake will slow).
    - Use PGRs to hasten and increase new flush growth.





# Action points

- Category 1:
  - Irrigate as frequently as possible
  - Use particle films during warm, dry periods (mid-fall, spring).
- Category 3:
  - Maintain irrigation/nutrition.
  - GA to increase new flushes to recover canopy.
- Base decisions on trees not on meteorological measurements.

**Thank You**

# Research: PGRs



- Increased canopy resilience of trees after pre-stress GA treatment at Category 1, but not Category 3.



	2021		2022	
Treatment	FDF	Yield (lbs/tree)	FDF	Yield (lbs/tree)
Untreated	5.49 b	316 b	5.26 b	35b
GA-treated	7.05 a	380 a	5.54 b	52 ab
GA+2,4-D-treated			7.07 a	68 a

