BAIT BALL SIMULATION

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Undergraduate Research Day
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Agenda

What is a Bait Ball?

Adopting Rowlands' Model

Our Model

What We Learned

Next Steps

WHAT IS A BAIT BALL?

A **bait ball** occurs when small fish swarm in a tightly packed spherical formation about a common center.

(Webb, 2015, p. 271)

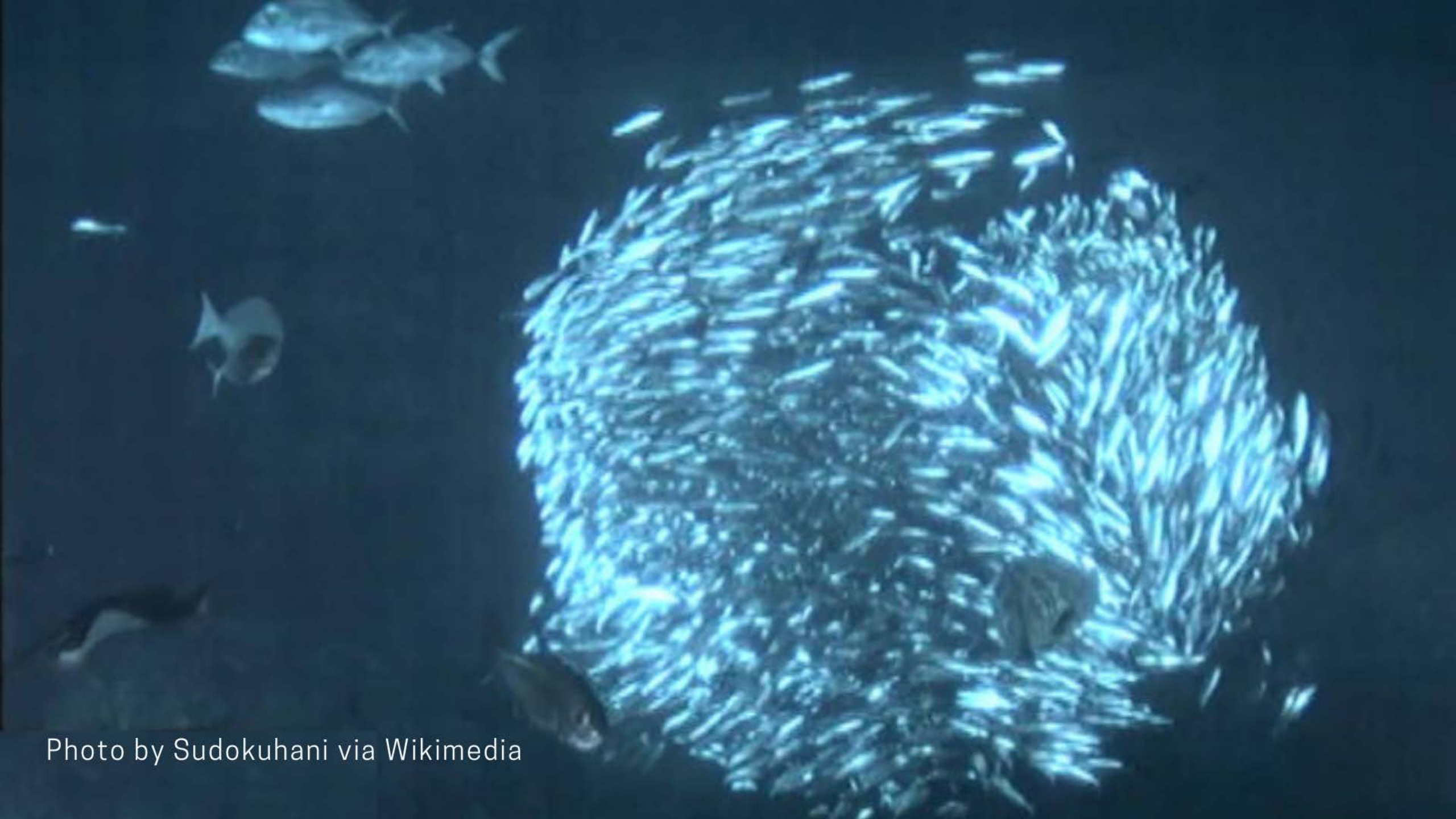


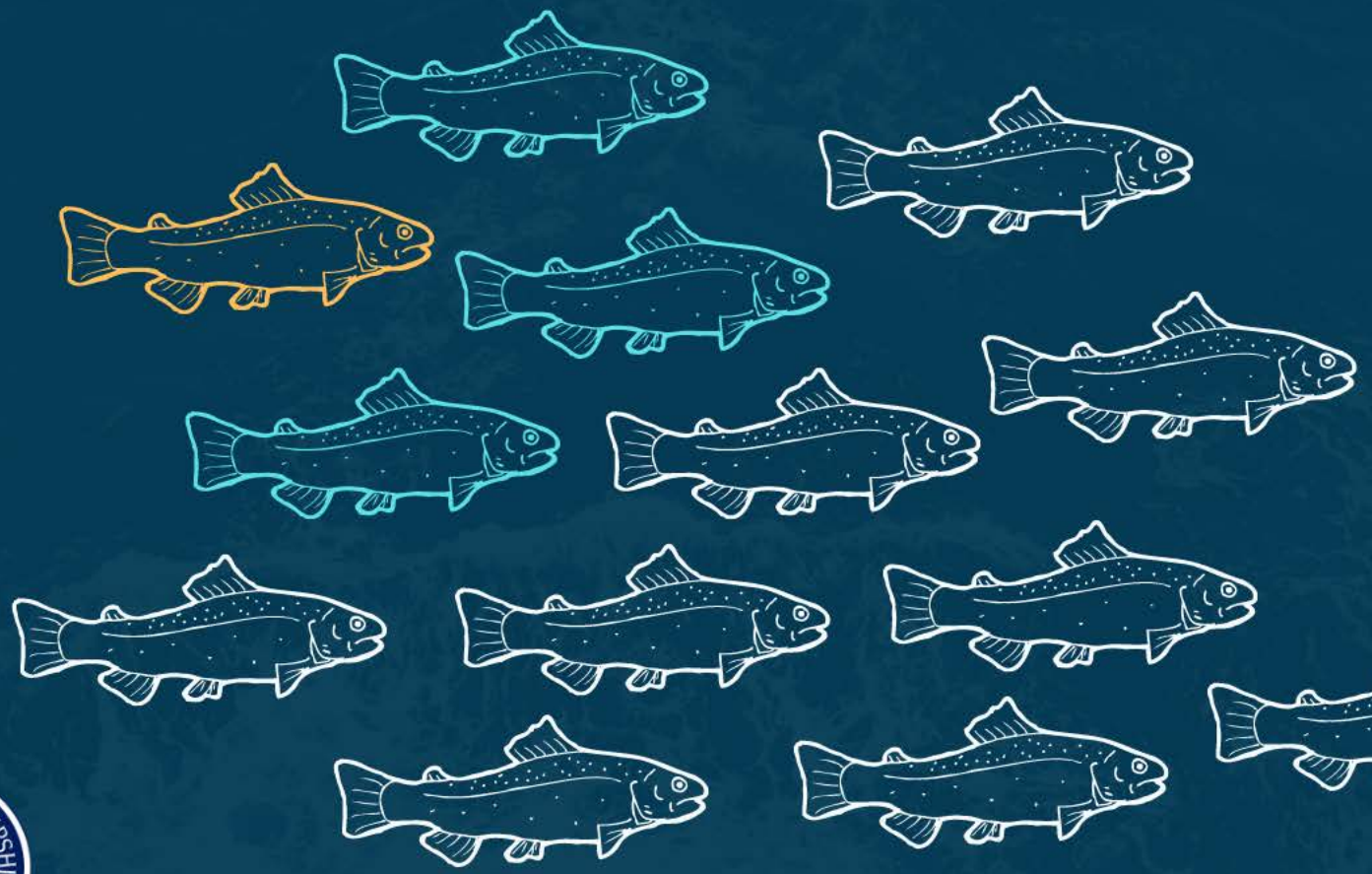
Photo by Sudokuhani via Wikimedia

ADOPTING ROWLANDS' MODEL

Agent-based model (looks at individual actions)

(Rowlands et al., 2014)

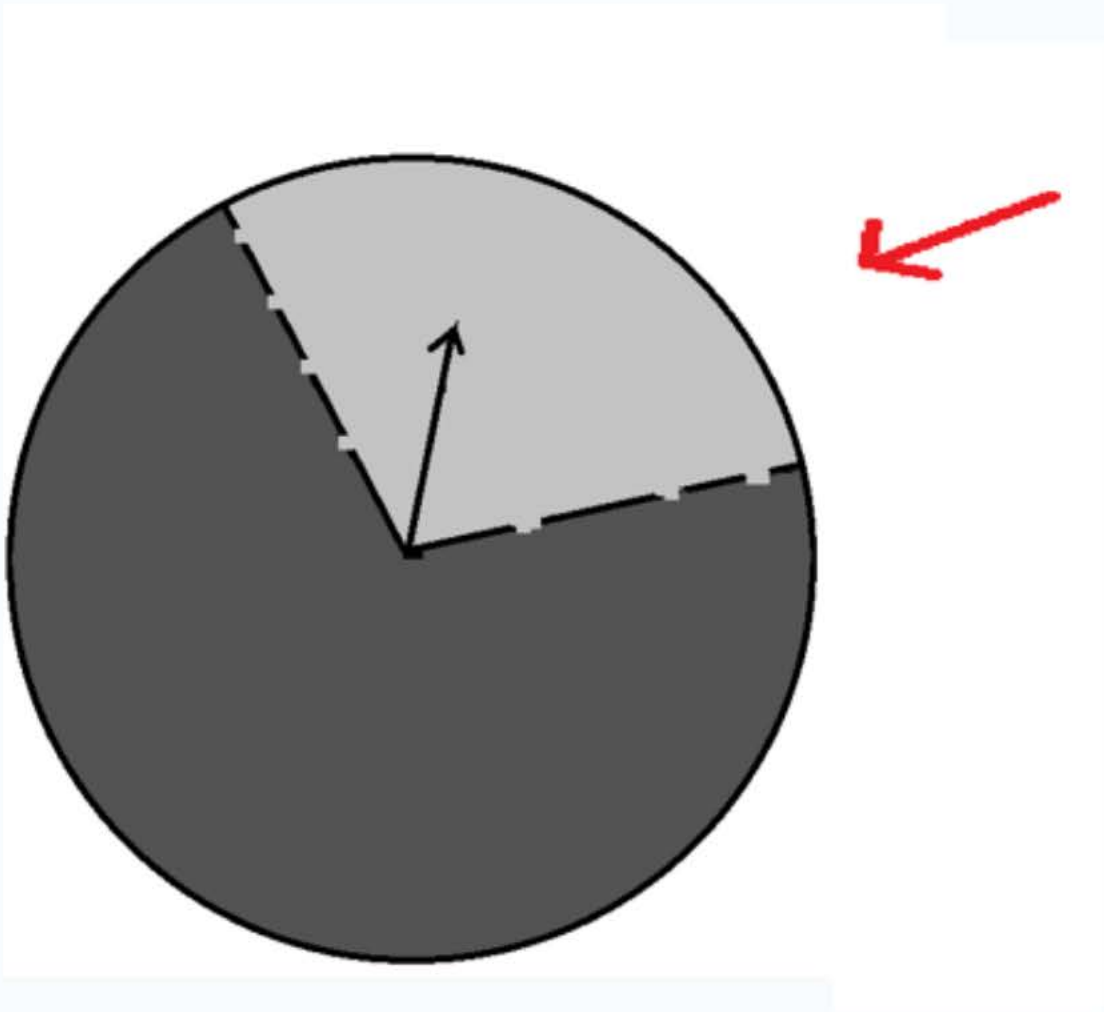
OUR MODEL

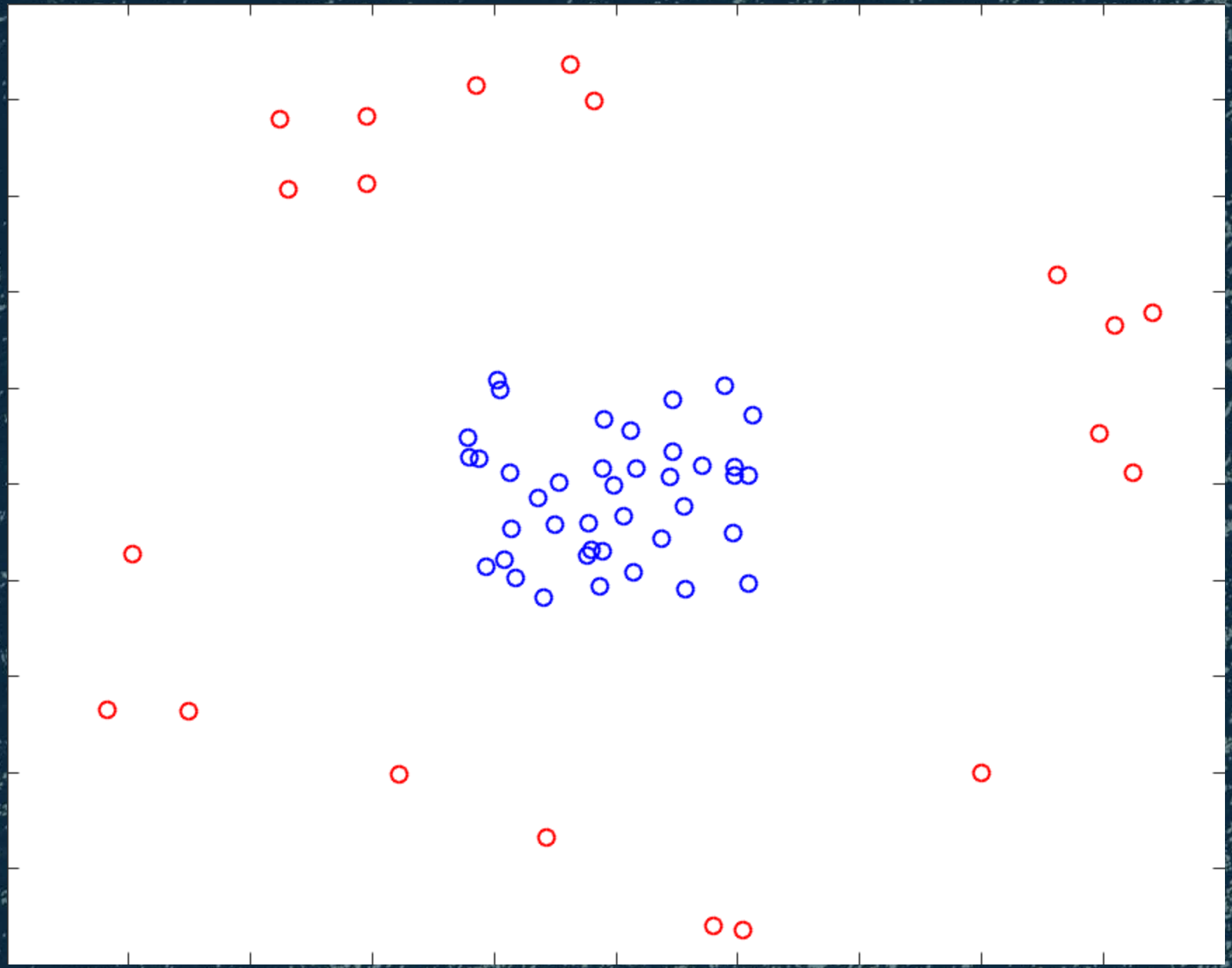


- Relative Position
- Neighboring Fish
- Predators

Predators & Calculations

- Field of View
- Distance to Predator
- Direction Away from Predator





WHAT WE LEARNED

"Too Many" Neighbors

Global Behavior

Resistance Vectors

NEXT STEPS

3 Dimensions

Sensory Organs

Hyperparameters

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THANK YOU

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Sources

Rowlands, G. (2014). The role of projection in the control of bird flocks. *Proceedings of the National Academy of Sciences*, 111(29), p. 1-5. 10.1073/pnas.1402202111

Webb, C.H. (2015). Bait ball. *The Georgia Review*, 689, p. 271.