

# Drag Force on Cars in Flooded Streets

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**KVIS – ISB**

**Student Research Collaboration Program Presentation**

# OUTLINE

- PART 1 : Introduction
- PART 2 : Method
- PART 3 : Result
- PART 4 : Conclusion
- PART 5 : Program Result



# Existing Research

E.g.

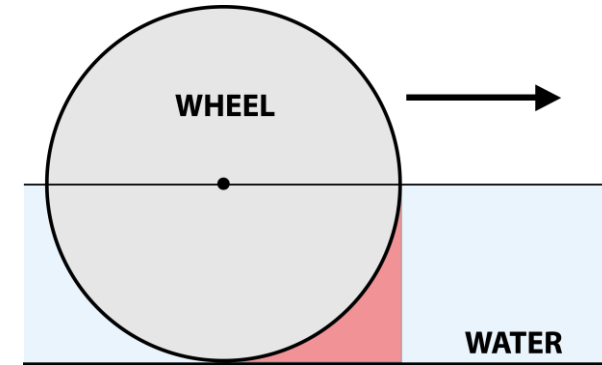
- Coefficient of friction with thin films of water
- Factors affecting floods carrying parked cars away

# RESEARCH QUESTION

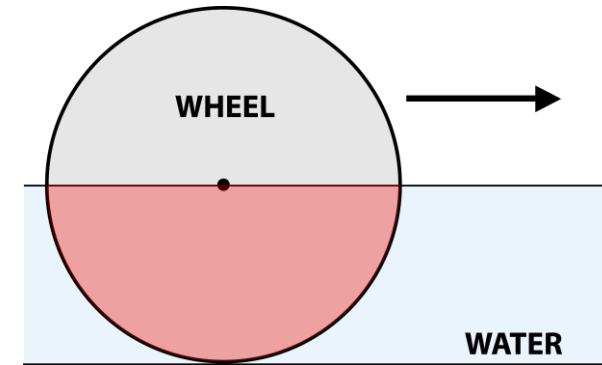
**How does depth of water and velocity of the car affect the magnitude of the drag force?**

# Dominant Factors of Drag Force

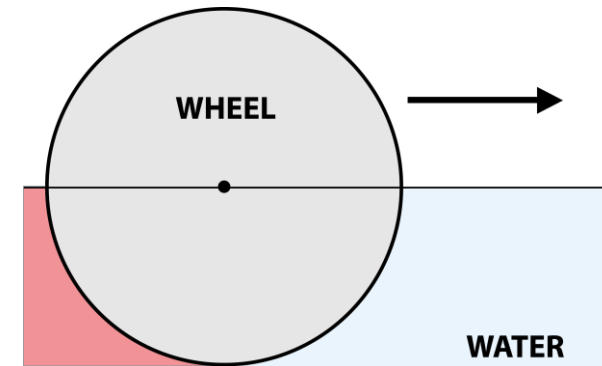
1. Displacement of water at the front of the wheels and formation of waves



2. Friction between water and sides of the wheels

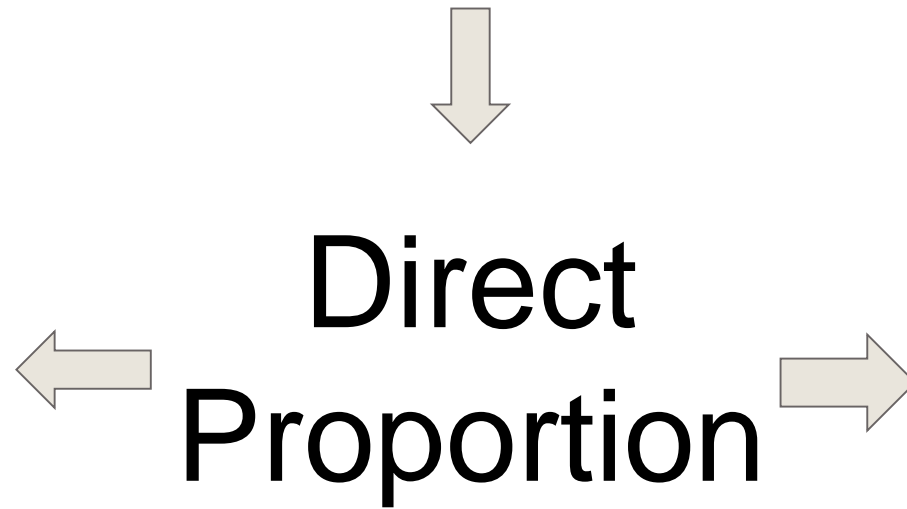


3. Turbulence at the back of the wheels



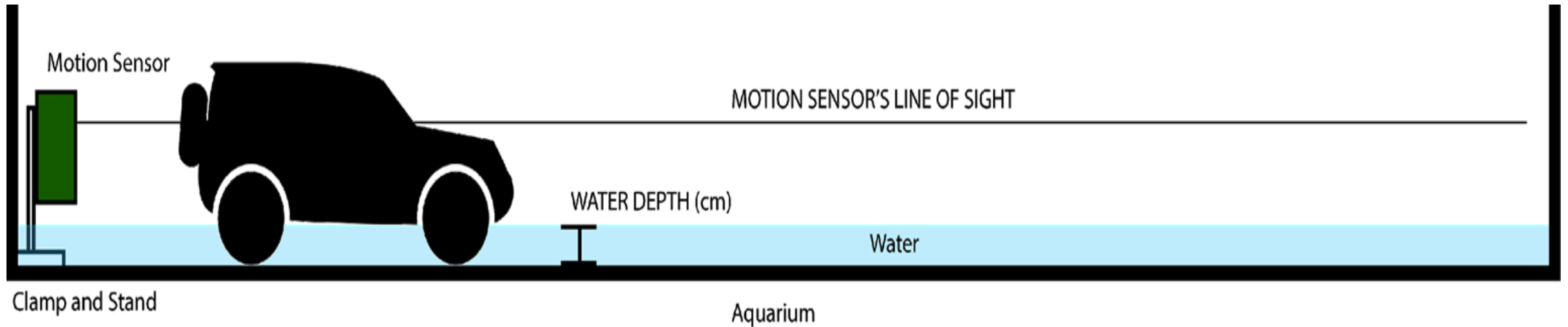
# Drag Force

Water  
Level



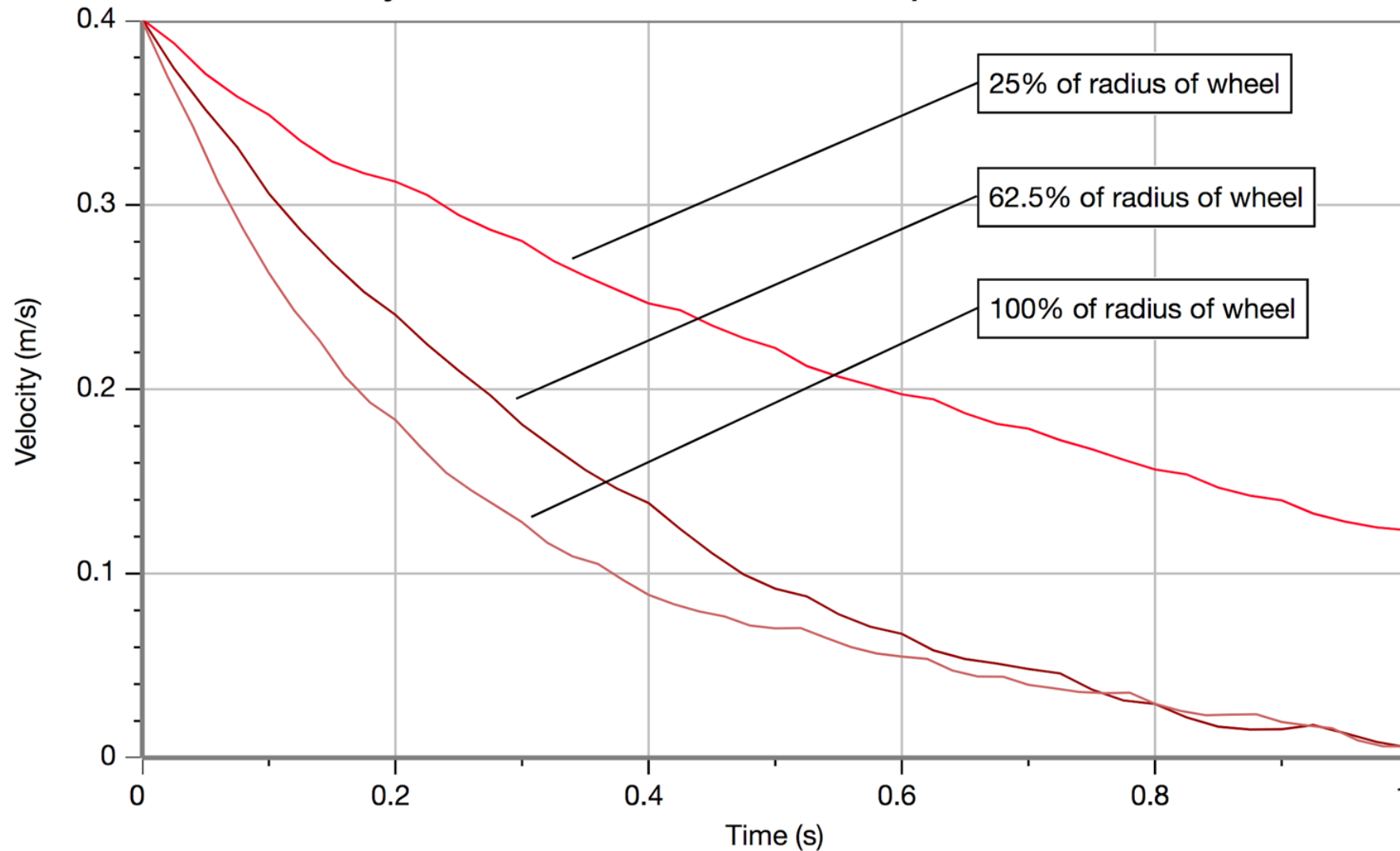
Car  
Velocity

# APPARATUS SET-UP



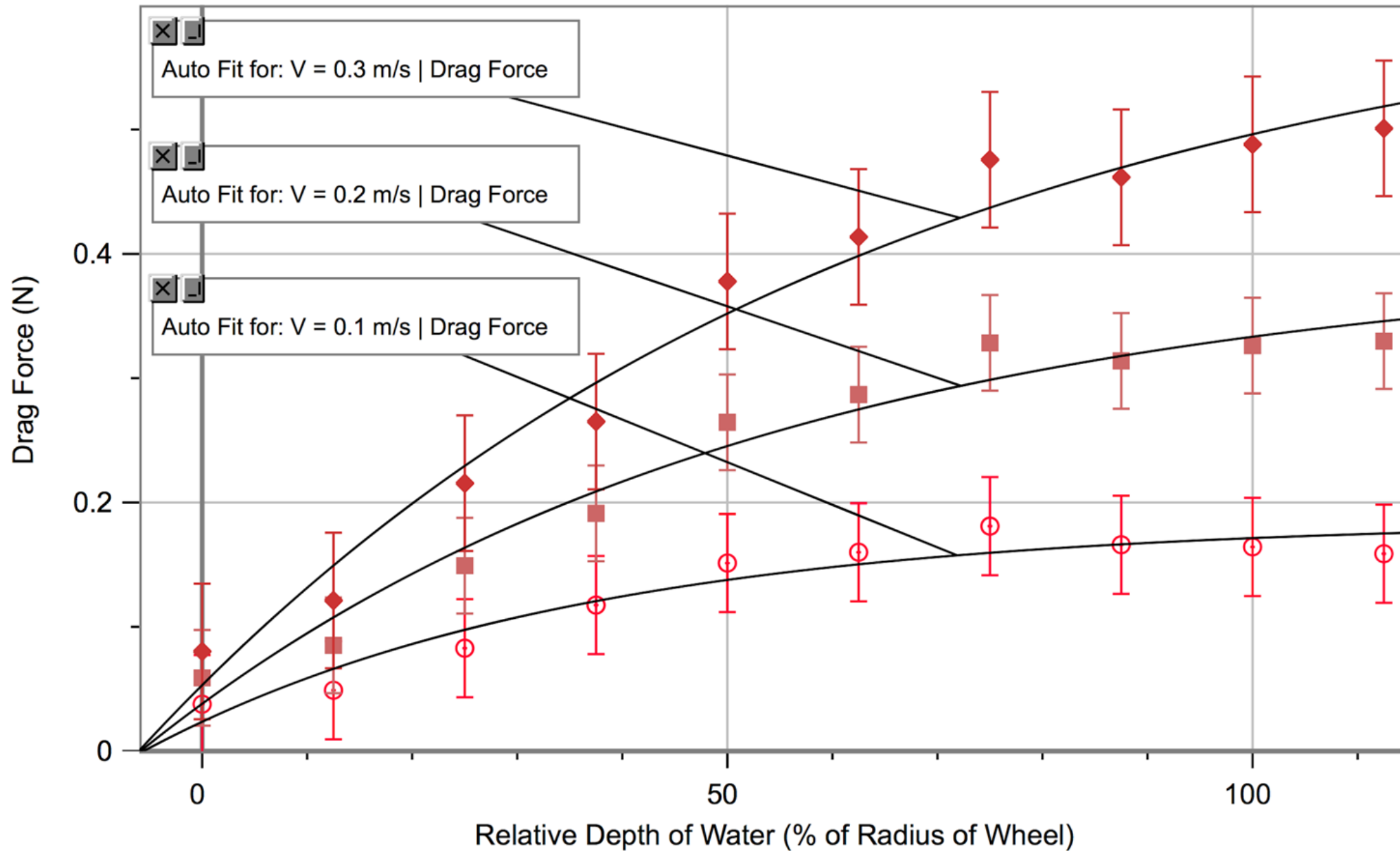
# Sample Data

## Velocity vs. Time at Different Depths of Water

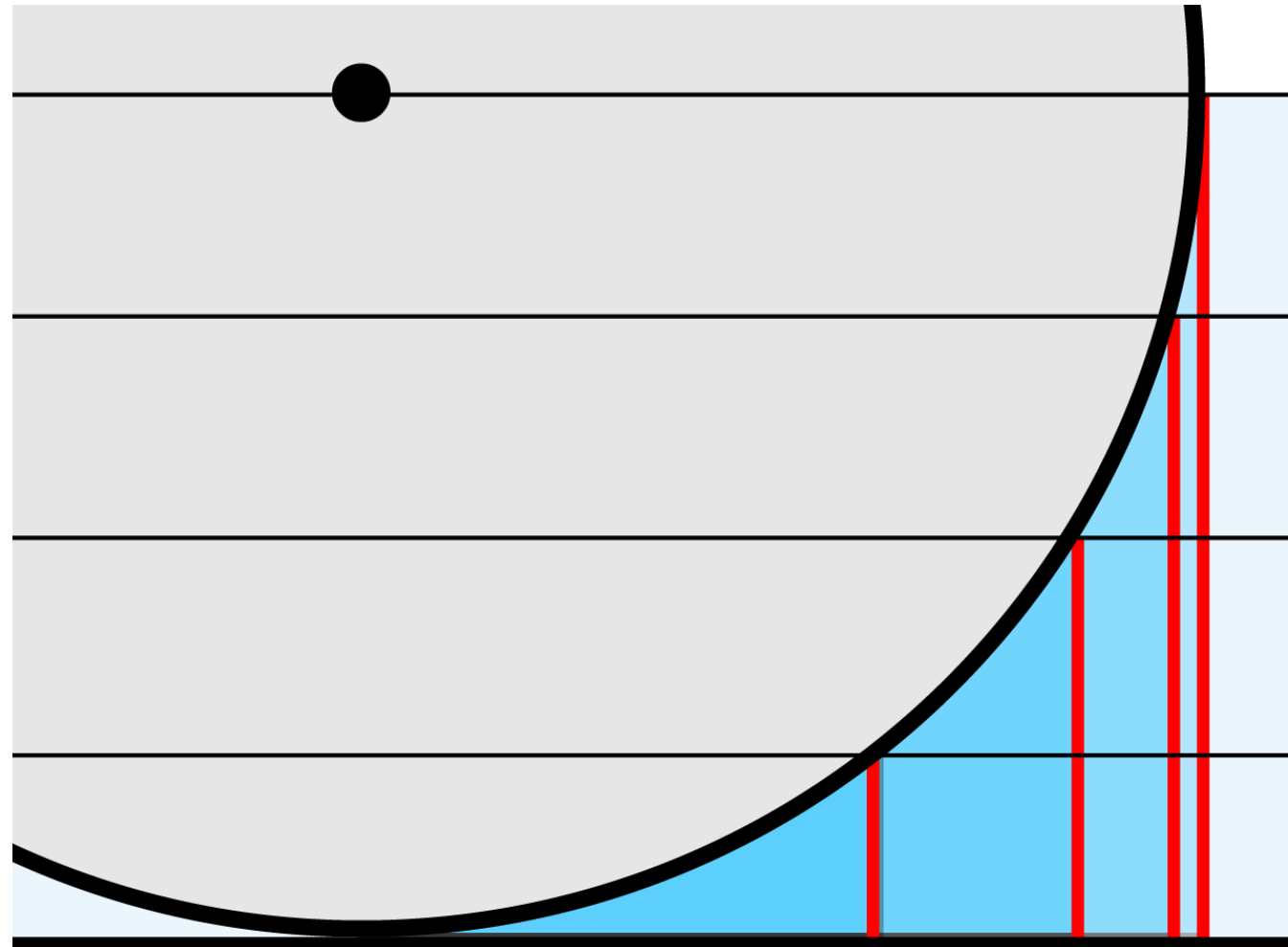
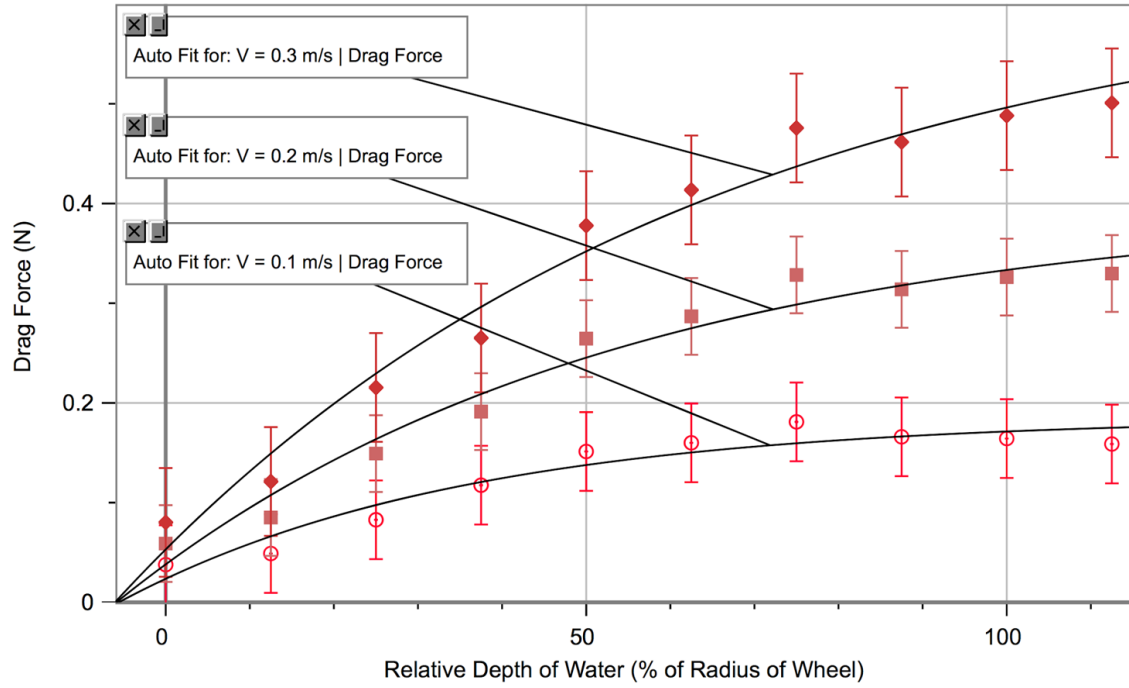


# RESULT

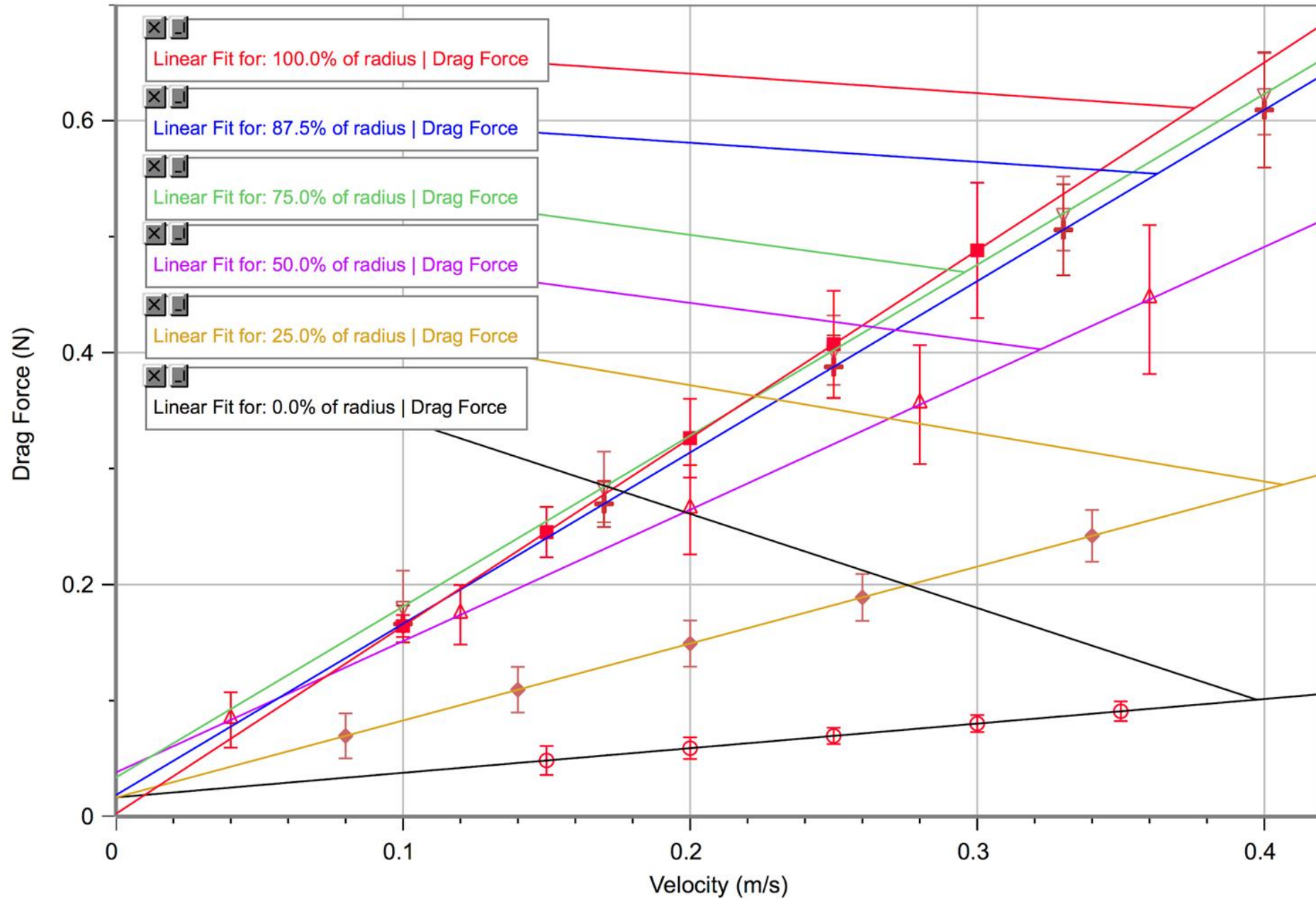
# Drag Force vs. Relative Depth of Water at Different Velocities



### Drag Force vs. Relative Depth of Water at Different Velocities

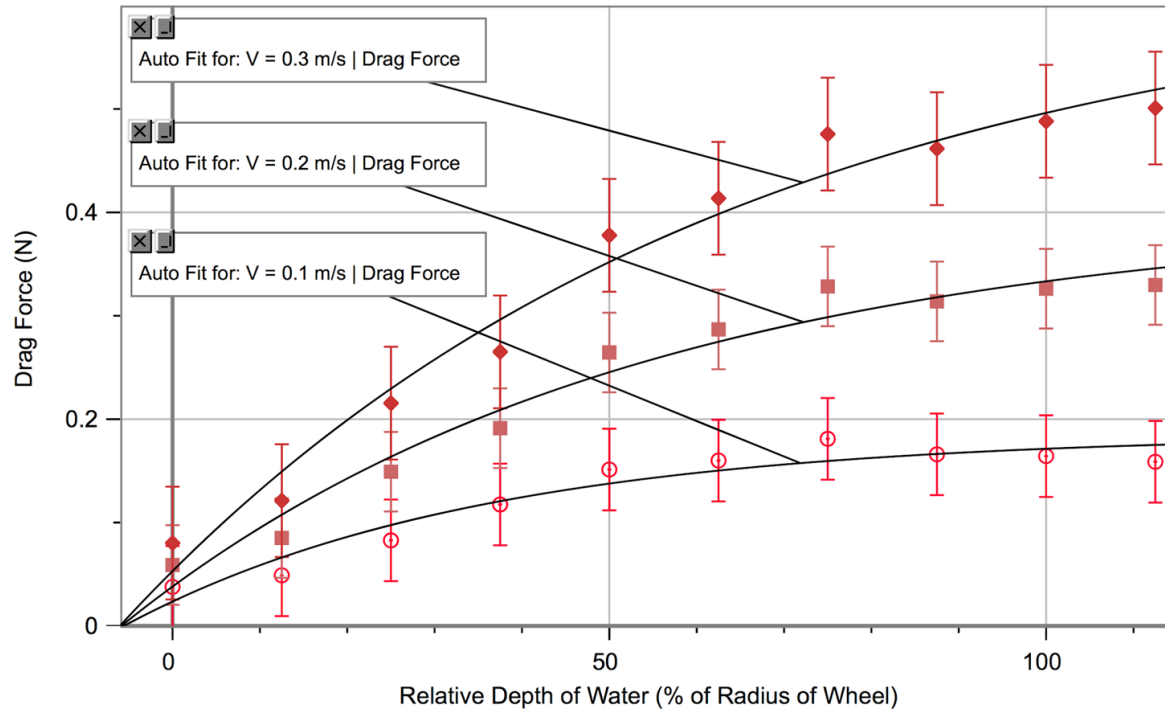


# Drag Force vs. Velocity of Car at Various Depths of Water

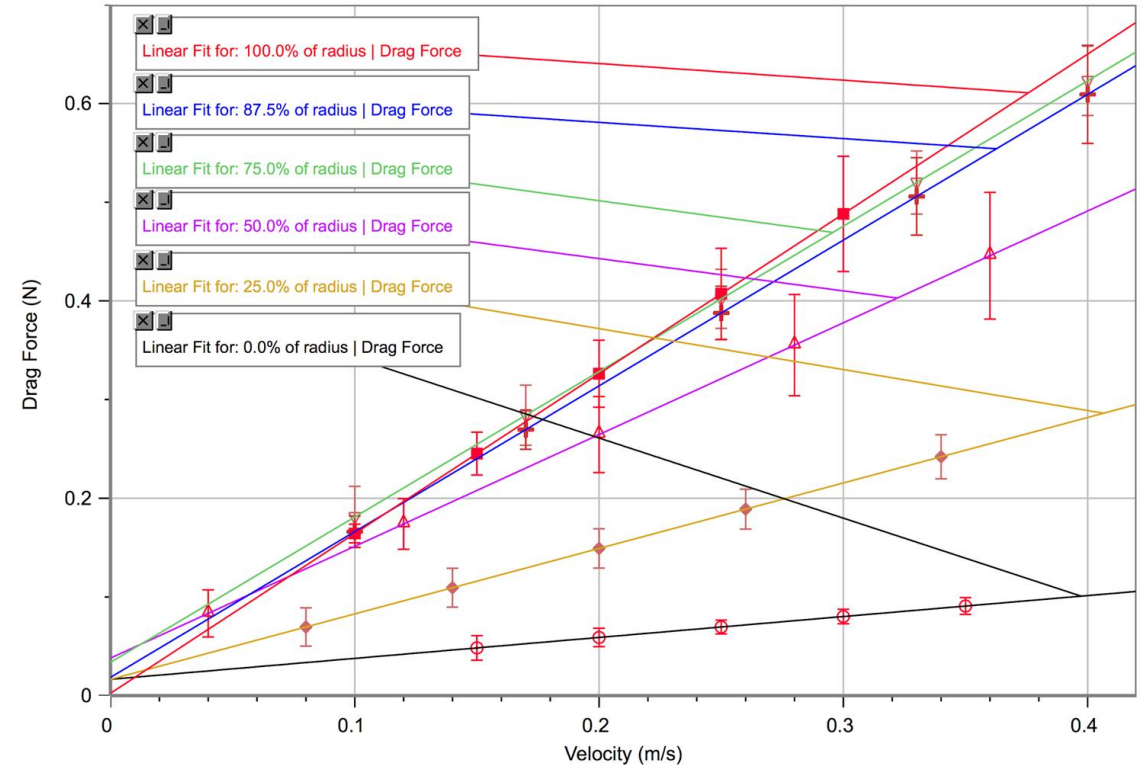


# Conclusion

Drag Force vs. Relative Depth of Water at Different Velocities

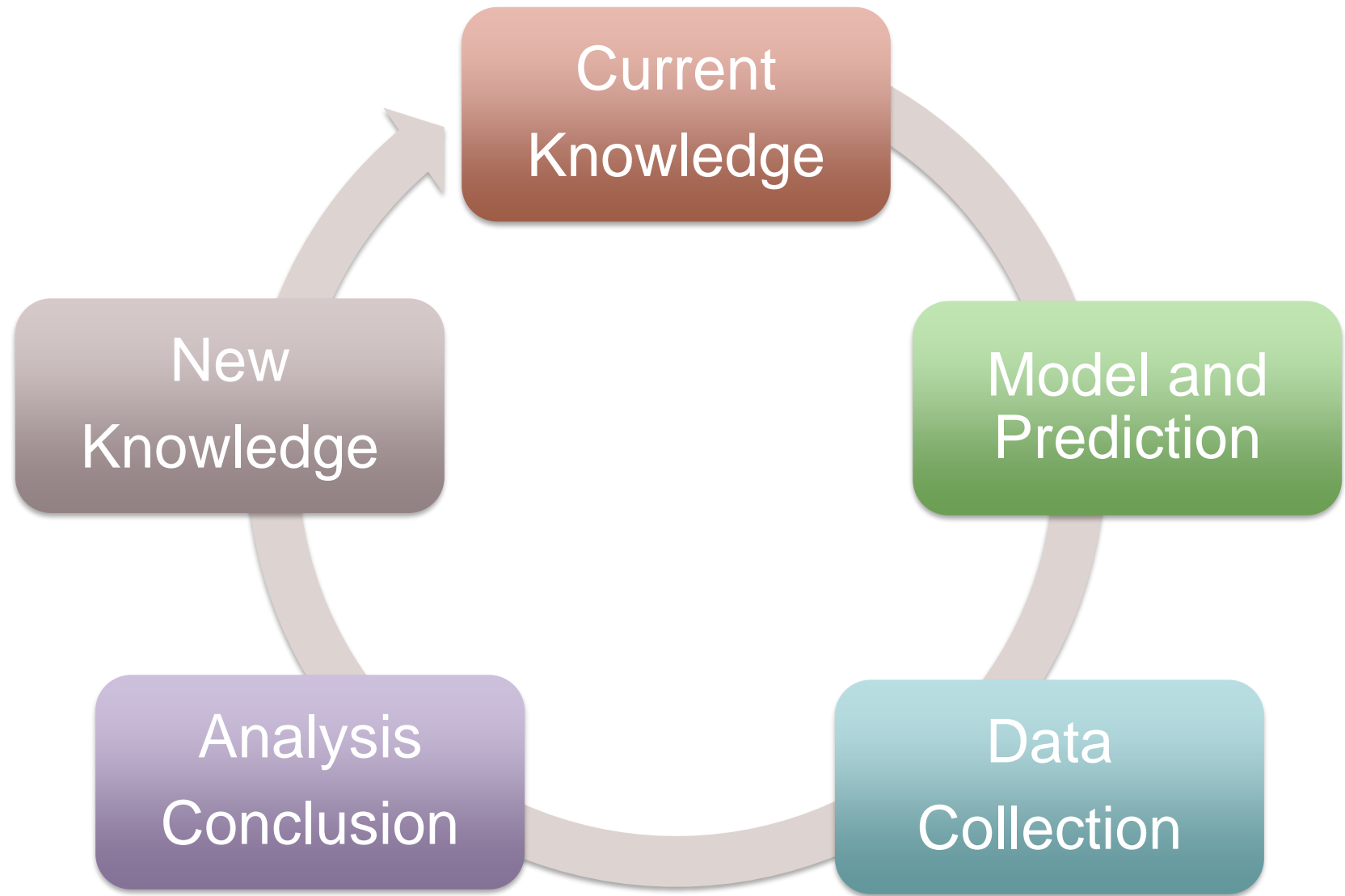


Drag Force vs. Velocity of Car at Various Depths of Water



- Increasing depth of water and velocity of the car increases drag force
- Rate of increase of drag force is greater at shallower depths
- Drag force is proportional to velocity with similar gradients at and above depths of 75% of the wheel's radius

# Program Benefit



# Acknowledgements

- **Dr. Jonathan Eales**
- **Dr. Min Medhisuwakul**
- **International School Bangkok (ISB)**
- **Kamnoetvidya Science Academy (KVIS)**

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