Modeling climate impacts on submerged aquatic vegetation (SAV) in Chesapeake Bay

2021 GIT Funded Project

Applicant: STAR

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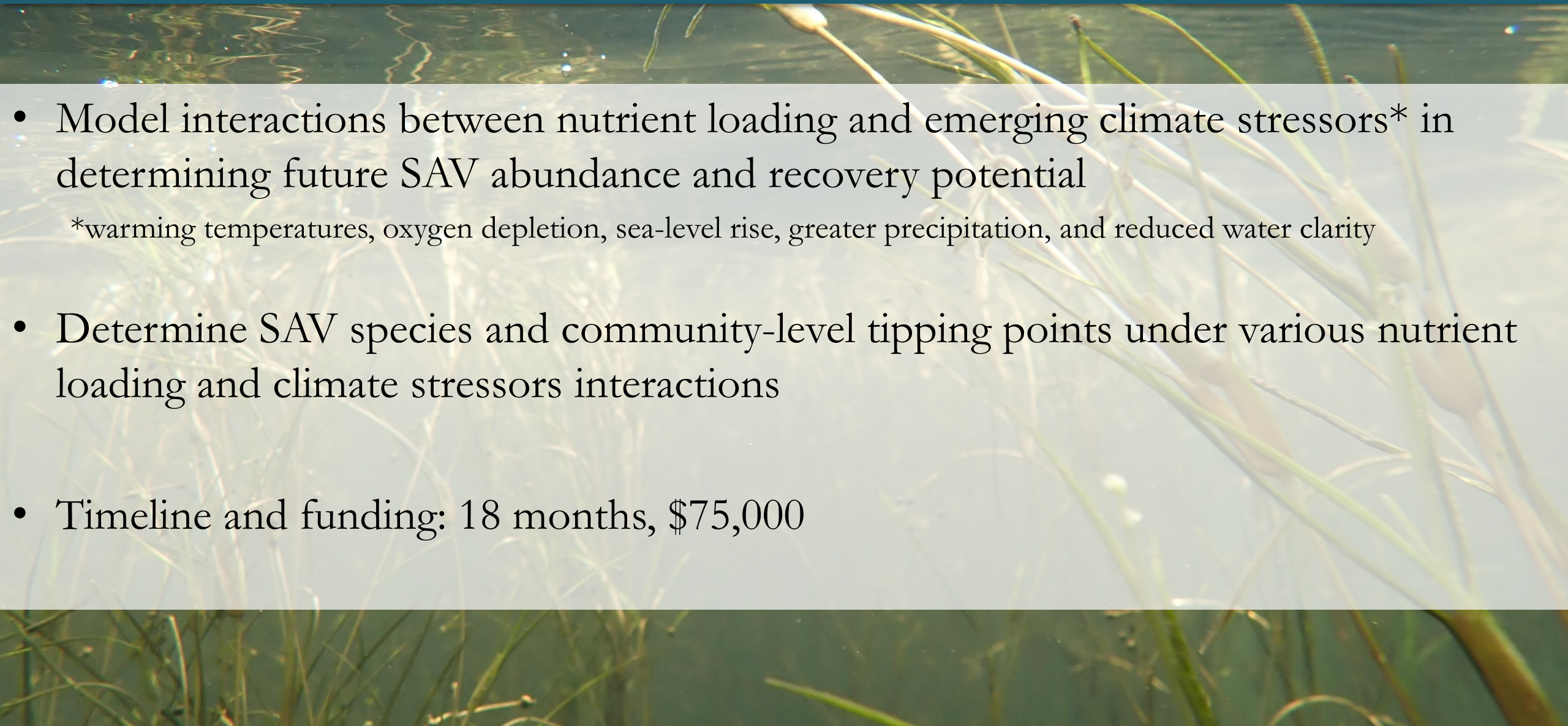
Project Objectives



- Model interactions between nutrient loading and emerging climate stressors* in determining future SAV abundance and recovery potential

  *warming temperatures, oxygen depletion, sea-level rise, greater precipitation, and reduced water clarity

- Determine SAV species and community-level tipping points under various nutrient loading and climate stressors interactions

- Timeline and funding: 18 months, $75,000

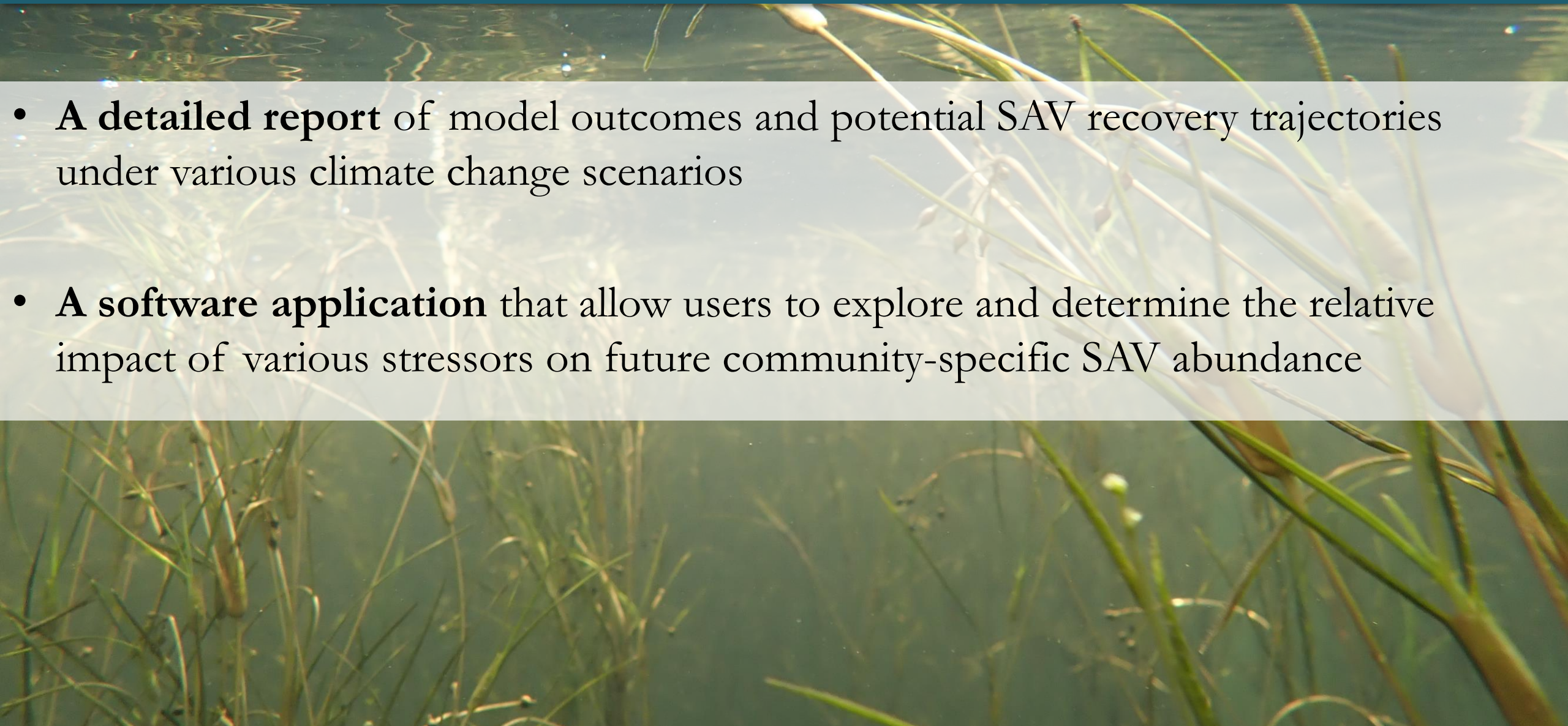
Project Justification

- Addresses the science need to better understand changing climate conditions and their impacts on SAV

- Addresses the interaction between nutrient loading and climate stressors to determine species and community-level tipping points

Balancing current successful nutrient management strategies with emerging climate stressors will be one of the biggest challenges the Chesapeake Bay management community faces in the coming decades

Project Outcome



- **A detailed report** of model outcomes and potential SAV recovery trajectories under various climate change scenarios

- **A software application** that allow users to explore and determine the relative impact of various stressors on future community-specific SAV abundance

Project Milestones

- **Recruit steering committee members** from the Chesapeake Bay Program partnership, including members of the SAV Workgroup, the Modeling Workgroup, and the Climate Resiliency Workgroup

- Conduct research and develop software application necessary to model climate change impacts on SAV in Chesapeake Bay

  a) Assemble long-term observational datasets on SAV cover, water quality, and climate parameters;

  b) Use advanced statistical models (ie. generalized additive models/GAMs) to assess interactions between nutrient loading and emerging climate stressors;

  c) Determine future SAV abundance and recovery potential and where possible, fit each model separately to quantify species-specific trends

- Convene meeting with **steering committee** to review results, software development, and final report

Cross Goal Benefits

- Habitat GIT SAV Outcome
  - Assessment of future SAV habitat availability in relation to climate change, sea level rise, shoreline alteration, and nearshore development to determine if segment-specific and Bay-wide SAV restoration goals are feasible
  - Identified as a need in SAV Management Strategy and Workplan
- Water Quality Standards Attainment and Monitoring
  - Improve understanding of Bay WQ response to loads and BMPs
  - Ongoing interest in restoration progress to management actions/climate influences
- Climate Resiliency Adaptation Outcome
  - Changing climate conditions and their impacts on SAV
  - Could support climate indicator development

Questions?

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