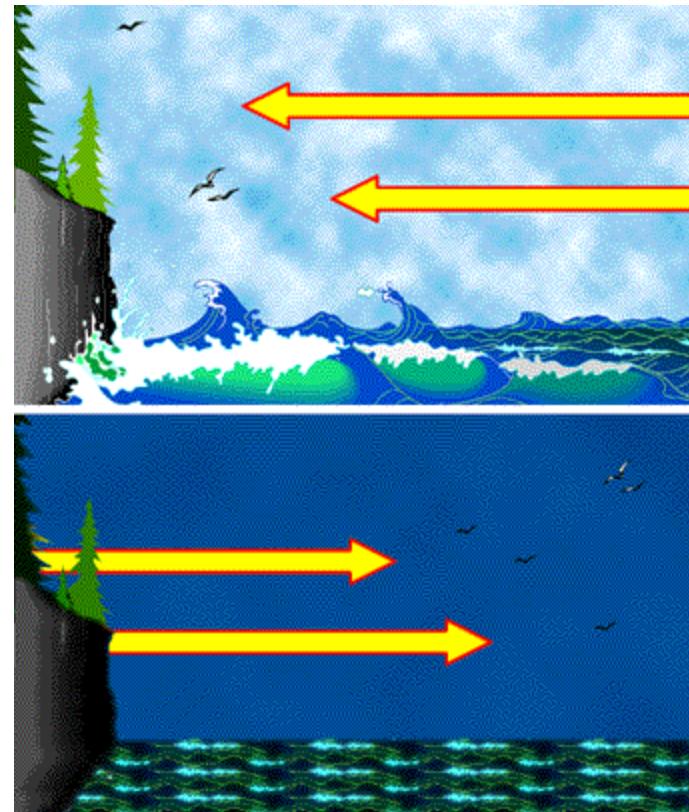


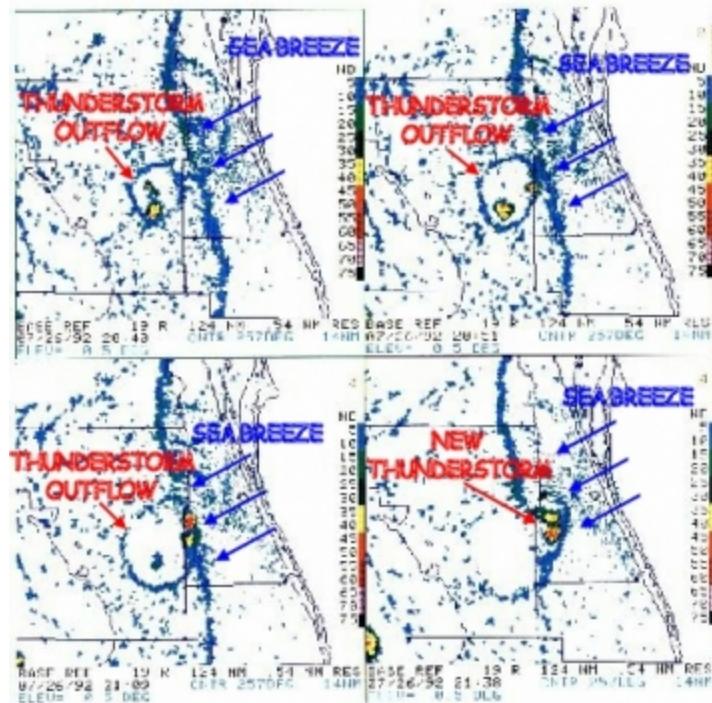
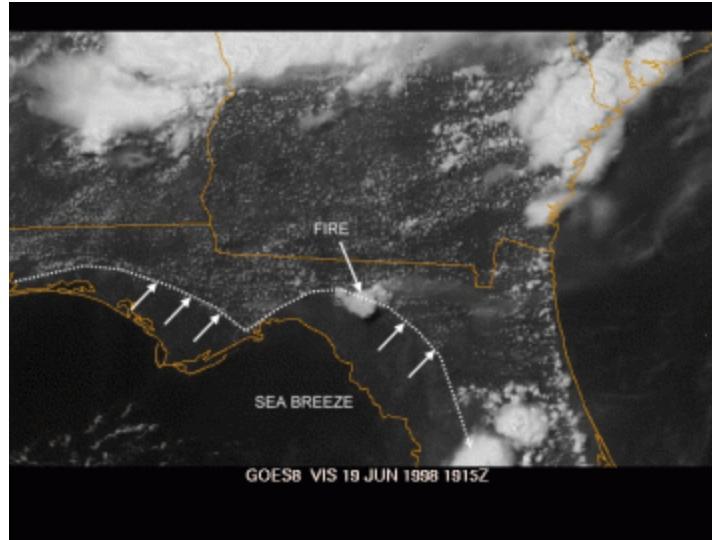
Land-Sea breeze work

Land-Sea breeze

- Differential heating between land and water causes winds from sea (**sea breeze**) at daytime
- reversal during the night-time winds from land (**land breeze**)



In real-world (Florida Melbourne)

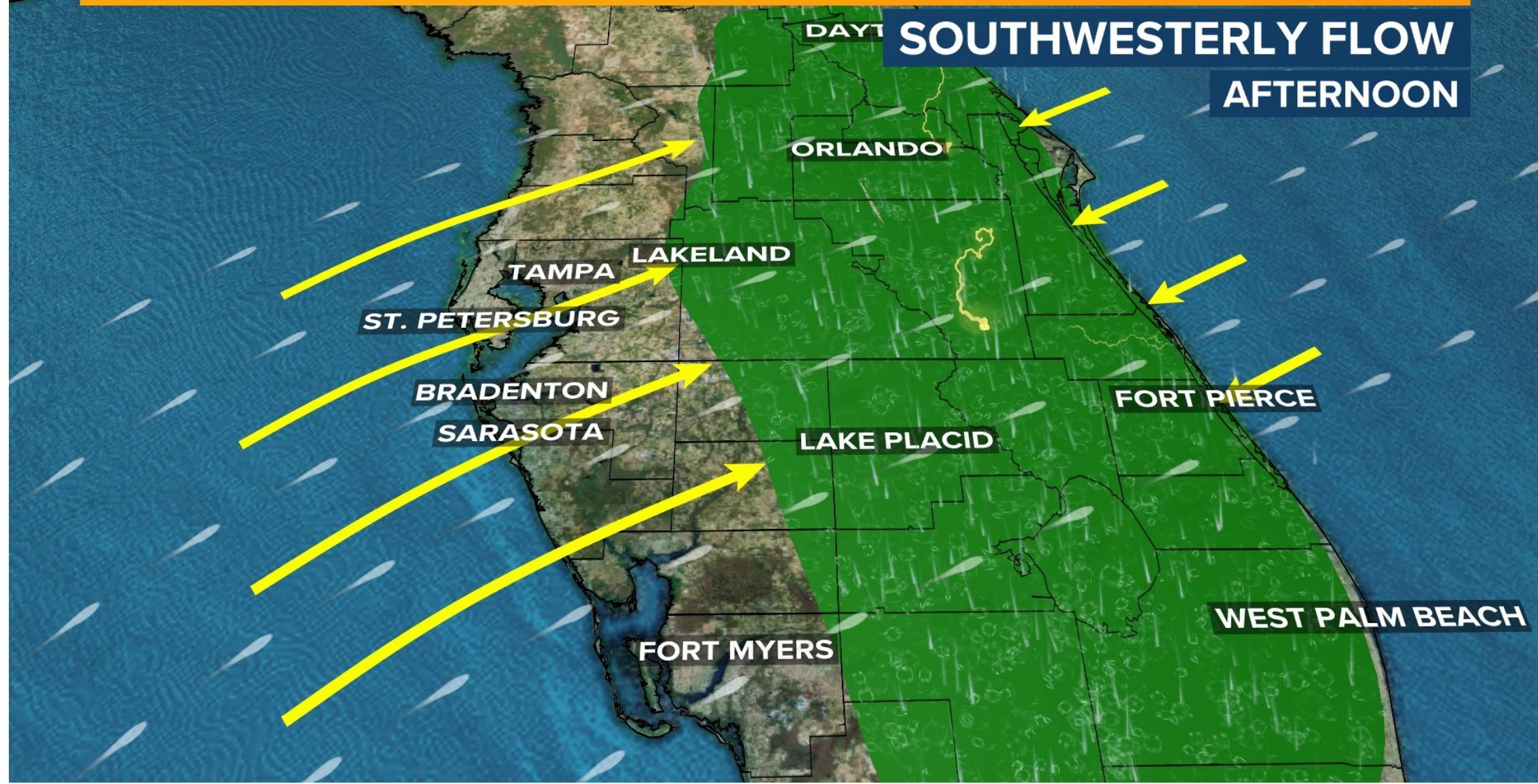




THE SEA BREEZE SETUP

DAY 1

SOUTHWESTERLY FLOW
AFTERNOON



The problem

1. It is difficult to predict the land-sea breeze onset.
2. For smaller regions (such as islands) there is no dominant wind direction.
3. There are no studies/models that predict the onset of land-sea breeze for smaller regions (or even for larger regions).



Land-Sea breeze index (single column)

- A simple index that will predict the onset of land-sea breeze based on single column data.

|FORECASTERS' FORUM

⑥A Single-Column Method to Identify Sea and Land Breezes in Mesoscale-Resolving NWP Models

CHRISTOFFER HALLGREN^a, HEINER KÖRNICH,^b STEFAN IVANELL,^a AND ERIK SAHLÉE^a

^a Department of Earth Sciences, Uppsala University, Uppsala, Sweden

^b Swedish Meteorological and Hydrological Institute, Norrköping, Sweden

(Manuscript received 14 September 2022, in final form 12 April 2023, accepted 17 April 2023)

The proposal (short-term)

1. Using existing single column model to create the land-sea breeze index with available observational ~14 year data
2. Create a deep learning categorical classifier to predict the onset of land-sea breeze for smaller regions using the same index.
3. Improve the model using different variables such as SST, wind speed, etc.
4. Tune the model to predict the onset of land-sea breeze for larger regions.

Long-term

- Create a model that can predict the onset of land-sea breeze for any region in the world.

Questions

1. What might be a best method to approach this problem?
2. Can we use genetic algorithms to tune the model? (or to find the best variables that can predict land-sea breeze)