

## Rip Currents Prediction in Ocean City, MD

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**Introduction:** About 95% of the surf rescues in Ocean City, MD are due to rip currents. With the increasing number of beachgoers over the past few years, rescues have increased as well, therefore understanding their occurrence can help avoid a threat to bathers. Here we present a rip current prediction methodology based on the usual environmental variables, such as waves and tides, but also include beach stage as a parameter.

Our research presents the results from investigation of various rip currents mechanisms, field observations from our Ocean City, Maryland camera system, and a prediction scheme for rip currents at the site. Ocean City has a dynamic nearshore environment where the Wright and Short (1984) beach stages recur in a repeating sequence. Wave conditions, bathymetry, wind, and tide elevation all have their effects on rip currents and studying these effects will help in predicting these currents. Former rip current prediction schemes have been investigated in an attempt to apply them to Ocean City, and a new techniques was developed for this particular site.

**Method:** In order to observe the beach response to environmental factors, we make use of video imaging techniques from cameras mounted on top of the Grand Hotel Ocean City. From the time-averaged video images we detect the presence of sand bars and rip channels. An example of a time exposure image is illustrated in Figure 1 where the nonuniformity of the bar is clear.

Rip current activity data such as rip rescues and rip threat assessment are obtained from the Beach Patrol office in Ocean City in order to compare with our observations of rip currents. These data are then correlated with wave, wind, tide data in order to see under which conditions rip activity occurs.

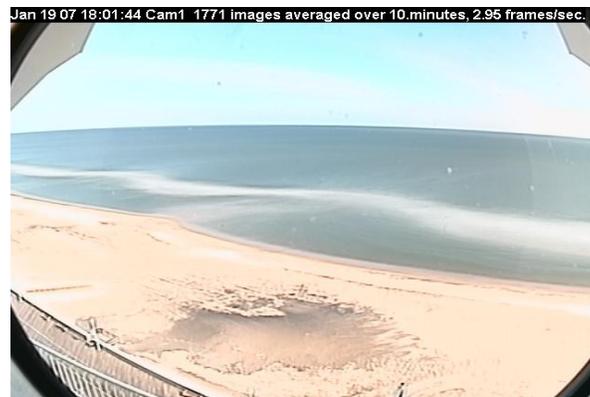


Figure.1. An example of a time exposure image from Ocean City, Maryland. (TBR morphology)

**Results and Conclusion:** The wave, wind and tide data of 3 consecutive summers in Ocean City was studied. The previous prediction schemes developed for Florida beaches were not successful in predicting rip currents in Ocean City, MD indicating that the scheme needs to be modified for each different beach environment. The correlation of wave, wind, tide data with the observed beach images indicate under which environmental conditions the rips currents form.

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