

# Tropical Cyclone Awareness and Preparedness in Cape Verde



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## Introduction & Motivation

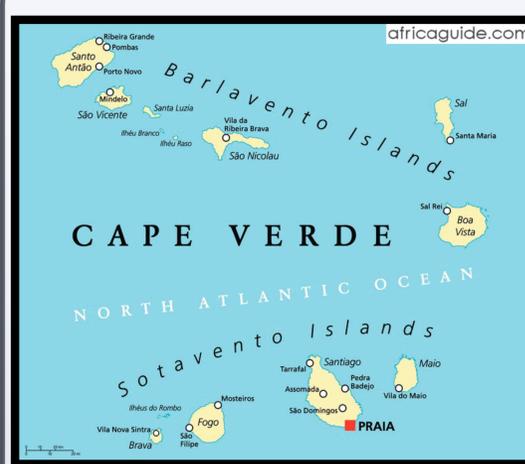
Cape Verde or Cabo Verde is made up of 10 islands off of the west coast of Africa in the Atlantic Ocean. This nation is at risk from the changing climate and tropical cyclone development due to its location.

- Sadly, Cape Verde does not have a radar so tracking tropical development is almost impossible.
- People of Cape Verde do not have experience with tropical cyclones and do not have a weather center or system in place.
- Most people from Cape Verde speak Portuguese which means the National Hurricane Center warning wouldn't be much help because their only offered in Spanish and English.
- This nation is an independent island country which means it is not apart of Portugal or Africa.

The goal of this project is to assist Cape Verde in being aware, educated, and prepared through communicating weather risk effectively in forms of flyers, website accessing, and text alerts.



## Location



➢ 350 miles off the west coast of Africa, lies the country of Cape Verde comprised of ten islands situated in the Atlantic Ocean. These storms usually have the necessary requirements to form tropical cyclones such as "warm waters (around 80°F / 26°C), weak vertical wind shear, pre-existing vorticity (ITCZ)."<sup>1</sup> These usually increase with size and strength thus forming tropical cyclones. Cape Verde tropical cyclone season begins August.

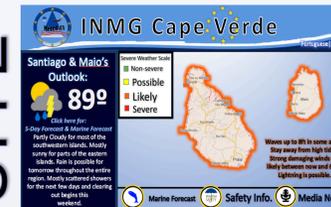
- With Cape Verde location surrounded by warm waters and all the necessary conditions for tropical development, this makes Cape Verde extremely vulnerable.
- Also as the climate begins to warm, the sea surface temperatures have increased. In the future it is possible Cape Verde will see an increase in tropical cyclone development.
- Hurricane Fred impacted the islands in 2015 and is the "first known hurricane"<sup>1</sup> since 1892. It is important to take note that Hurricane Fred developed extremely fast off the west coast of Africa.

## Development of Tools to Aid Tropical Cyclone Preparedness

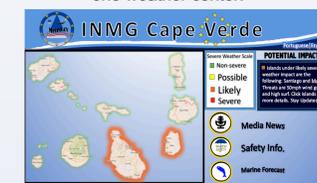
Watch Flyer. Designed for an **Orange** category and usually 48-36 hr. gap between the islands and the storm. Orange means likely on the severe weather scale. This was created to mimic the National Weather Service and also attach colors to grab attention.



Warning Flyer. Designed for a **RED** category and usually 36hrs or less gap between the islands and the storm. Red means severe on the severe weather scale and means the storm will occur. This flyer has the timing of the storm, impacts, and an emergency kit.



Website design. This was created to assist INMG with ideas for their website. This website focuses on three different audiences such as citizens and tourist, city officials, and on-camera meteorologist. The goal was to connect all the islands of Cape Verde under one weather center.



Educational games and modules. This was created to assist INMG with ideas for their website. This module focuses on the younger generation which is children in grade school. Sandro (a fish because fishery is a source of economy in Cape Verde) teaches young children about tropical cyclones, storm surge, emergency kits, and a fun matching game. Michelle's module is for younger adults and families to learn how to build a tropical emergency kit. Both modules are intended to be on the website under safety information.



FLYERS

MODULES

WEBSITE

## Methodology

- Before the process of implementing these tools for Cape Verde, I conducted research pertaining to the history, culture and location of the islands. I also researched the background of tropical cyclones that had affected the islands and how they develop from African Easterly Waves. This research led to the discovery that Cape Verde lacked the important tools for awareness and preparedness systems for the communities on the Islands.
- I started to create a website design in a limited time period with direct contact from the governmental weather service of Cape Verde through Dr. Gregory Jenkins. This government initiative by Cape Verde is completely new and goes by the name INMG (Instituto Nacional de Meteorologia e Geofisica). I used four colors to outline the severity of potential storms.
- My flyers consist of the following and in order of importance: timing, impacts, and the tropical cyclone emergency kit. The learning modules were modified for younger children which is Sandro (fish) for grade school and Michelle for young adults and families.

## Conclusion & Future

Although this is an on-going process, I created the flyers and educational games in hopes of preparing the nation of Cape Verde. Working with Cape Verde government officials and INMG, I would like to create more educational ideas for children for their website and for local school teachers. Educating the younger generation could help build awareness in homes and communities. Creating flyers such in later years hopefully Cape Verde can be consider a weather ready nation (WRN) under NOAA and once apart of this organization, Cape Verde could possible receive a weather radar. The radar could improve forecast in Cape Verde and track potential tropical cyclone development. The radar could also be used as hurricane data with the National Hurricane Center and potential track storms before it could possible carry to the east coast of the United States.

## Acknowledgments & References

- <sup>1</sup>Dunbar, Brian. "What Are Hurricanes?" NASA. NASA, 4 Sept. 2015. Web. 25 July 2016.
  - Canva.com
- This work was supported by the National Science Foundation through the Network for Sustainable Climate Risk Management (SCRiM) under NSF cooperative agreement GEO-1240507. Any opinions, findings, and conclusions or recommendations expressed in this material are those of the author(s) and do not necessarily reflect the views of the National Science Foundation. Images are not my own and are not for profit. Images in the introduction box are owned by Dr. Jenkins. Special thanks to Dr. Jenkins, Barbara Watson, NWS State College, Adjoa Ronke, Luis Ribera, and Avery Bowers. Thank you SCRiM and Penn State for the opportunity.