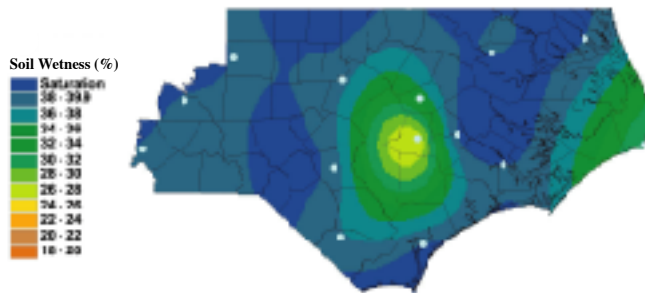


# Understanding Landfalling Hurricanes

Predicting the path and intensity of an approaching tropical cyclone is essential for planning evacuations and disaster mitigation. However, it is also critical to understand the dynamics of these storms after they make landfall. The State Climate Office has been very involved in this area of research, and has developed tools that forecasters can use to improve prediction of changes in intensity of landfalling hurricanes.

## Soil Moisture Analysis Prior to Hurricane Fran

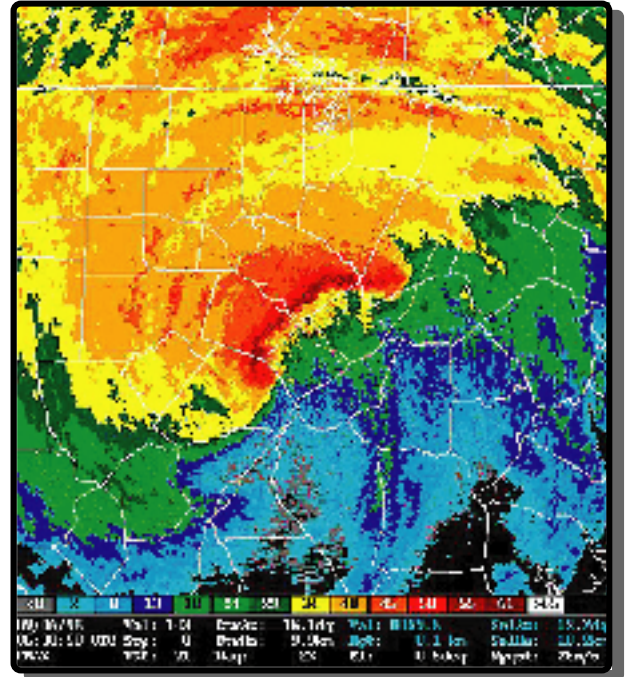


September 4, 1996

Uneven rainfall prior to Hurricane Fran's landfall may have led to increased winds and precipitation over the triangle area. The soil moisture gradient that was in place appears to have provided the necessary heat flux gradient to increase storm intensity even though the storm's center of circulation was well inland.

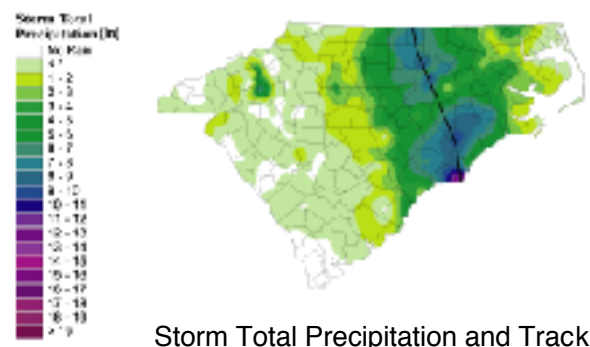
Prior to the landfall of Hurricane Fran in 1996, scattered thunderstorms in the piedmont and eastern parts of North Carolina left some areas with very moist soil and others with dry soil. This gradient in soil moisture is believed to have caused local circulations which in turn acted as a trigger for deep convection and re-intensification of Hurricane Fran.

The SCO continues to investigate the critical importance of soil moisture and other local factors that play a role in severe weather dynamics and environmental interactions.



Heavy rainfall and winds from Hurricane Fran caused billions of dollars in damage not only along the NC coast but inland in the Triangle region.

## Hurricane Fran (1996)



Analysis of precipitation and radar patterns show that Hurricane Fran re-intensified inland as it moved over the Triangle Area.