

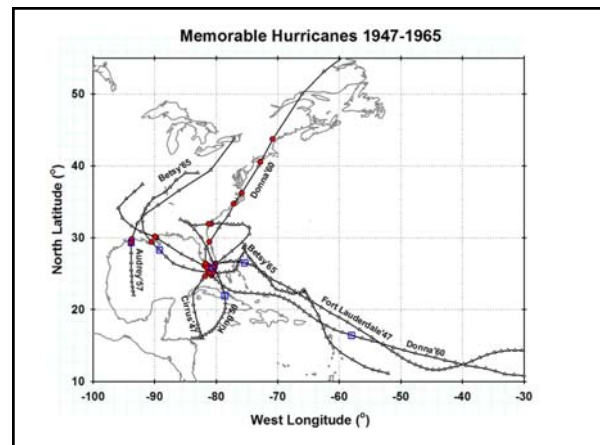


### Scientific Advances in the 1940s

- NWS reports that reconnaissance reduced loss of life in the Great Hurricane of 1944
- Radar first used in FL-Havana Hurricane of 1944
- Expanded upper-air observations worldwide
- First eye sounding in Havana/Tampa Hurricane
- Herbert Riehl's founding of US Tropical Meteorology at Univ. of Chicago
- Former military & naval meteorologists enter the field

### Grady Norton & NHC

- 1935: Norton became chief hurricane forecaster at Jacksonville
- 1943: NHC moved to Miami as a joint (Weather Bureau, AF, Navy) hurricane forecasting office
- Skilled communicator & spokesman

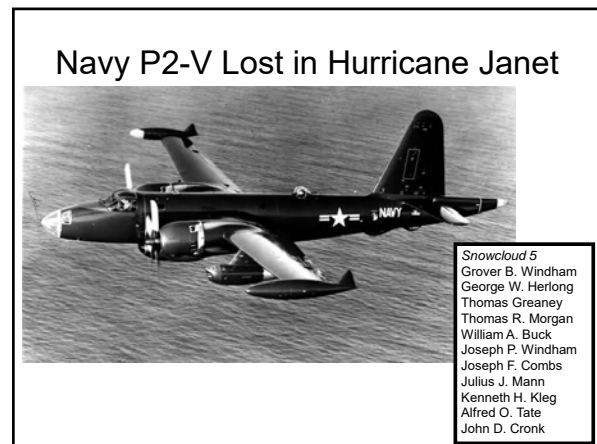
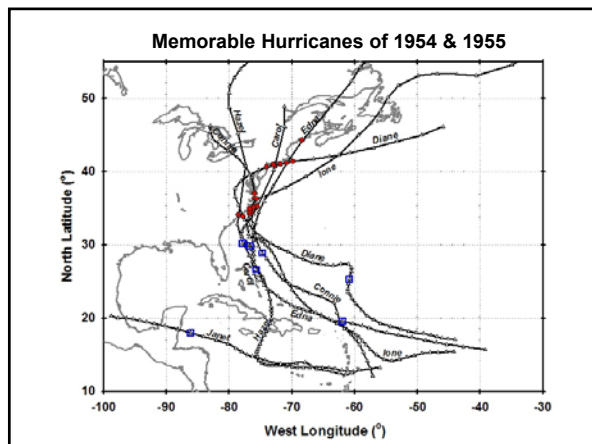


### Florida Hurricanes of 1940s

- 1945: Richmond Field (Cat-3) hurricane destroyed (burned) Navy blimp base on present Metrozoo site.
- 1947: Two hurricanes in Miami
  - Ft Lauderdale (Sep 17, CAT 4 in FL; CAT 3 in LA)
  - Cirrus (Oct., CAT 1 in FL, CAT 2 in GA & SC, W-to-E motion)
  - Extensive flooding in W Dade & Broward
- 1950: Hurricane KING, north Dade & Broward (CAT3) very compact storm, < 10 mi wide.

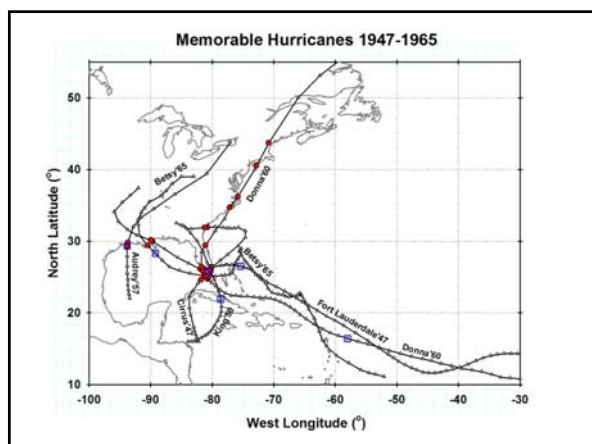
### King in 1950 and the Naming of Storms

- 1941: George R. Stewart's novel *Storm*: "Junior Meteorologist" gave storms women's names.
- 1950: Phonetic alphabet, Able, Baker, Charlie, ...
- 1953: Women's names
- Six lists cycle
- Names of devastating or deadly cyclones retired
- 1978: Changed to male and female names (Juanita Kreps was Secretary of Commerce)
- Names are drawn from English, Spanish & Creole



### Gordon Dunn

- Grady Norton died of a stroke during Hurricane Hazel of 1954
- Succeeded by Dunn
- Isaac Cline also died in August 1955
- Six hurricanes in 1954 & 1955 (Carol, Edna, Hazel, Connie, Diane & Irene)
  - 400 dead
  - \$2B in damage
  - Blamed on testing the **BOMB**



### Audrey 1957

- Early-season, 25-29 Jun
- Landfall near Cameron, LA (like Rita in 2005, or Gustav, sort of...)
- CAT4
- Killed > 390 people
- Good forecasts, poor communication
- Inspired Dunn to hold hurricane preparedness conferences

## Donna in 1960

- Cape Verde Hurricane
- Briefly CAT 5
- Affected entire US Atlantic Coast
- CAT 4 in the Keys and FL West Coast
- CAT 3 in NC and New England or weaker
- Killed 364 (50 US)
- \$3.3B in damage
- Slow moving, lots of rain
- Would be catastrophic today



## Donna on Aircraft Radar (APS-20)

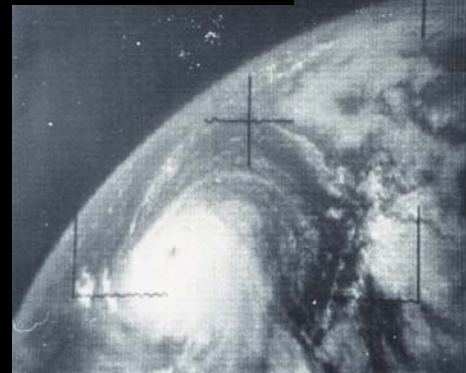


## Meteorological Satellites

- TIROS-1
  - TV & IR Observation Satellite
  - Launched 01APR60
  - Polar orbit ~850 km
  - 2 looks at each place on Earth daily
  - Evolved into ESSA then NOAA satellites
- SMS
  - Synchronous Meteorological Satellite
  - Launched 1974
  - Equatorial orbit ~34,000 km
  - Stays over the same place on the equator continuously
  - Evolved into GOES satellites



## APT Image of Betsy



## Betsy in 1965

- Cape Verde Hurricane
- Two anticyclonic loops in the Atlantic before FL landfall as a CAT 3
- Passed over FL to second landfall in LA (CAT 3)
- Last SFL hurricane until Andrew in 1992
- Passed SW of the city moving NW
- Extensive flooding
- Damage \$1.45 B (1965 \$)
- Killed 76
- Became the design storm for Army Corps of Engineers improvements to levee system
- Which failed 40 years later in Katrina



## SUMMARY

- Wartime (1941-45) developments
  - Aircraft reconnaissance
  - Radar & upper air observations
  - Wartime cohort of meteorologists
- Future NHC moves to Miami in 1943, Grady Norton in Charge
- Two hurricane hits on Miami in 1947, extensive flooding in West Dade
- Compact, CAT3 Hurricane King tracks N over Dade & Broward Counties
- Naming of storms:
  - Phonetic in 1950
  - Women's names 1953
  - Men & Women's in 1978, English, Spanish and Creole
- Six hurricane affect mid-Atlantic states in 1954 & 1955
  - Navy P-2 lost in Janet in the Caribbean
  - Motivated establishment of NHRP, deployment of WSR-57 radar
- Grady Norton dies of a stroke during Hazel of 1954, succeeded by Gordon Dunn
- Audrey of 1957 kills ~390 in Cameron Parish LA. Good forecasts, poor communications
- Donna of 1960 affects E Coast from Florida to Maine, kills 354 total, but only 50 US
- Satellites: Tyros (polar orbit, NOAA) 1960; SMS (geosynchronous, GOES) 1974
- Betsy of 1965 kills 76 in US
  - Affects S. Florida & LA (CAT 3). Track like Andrew & Katrina
  - Design storm for New Orleans Levees

For NEXT TIME: E 193-202, 213-219; SW 96-124