



# Meteorology and Bandwidth

Meteorology,  
like many other human endeavors,

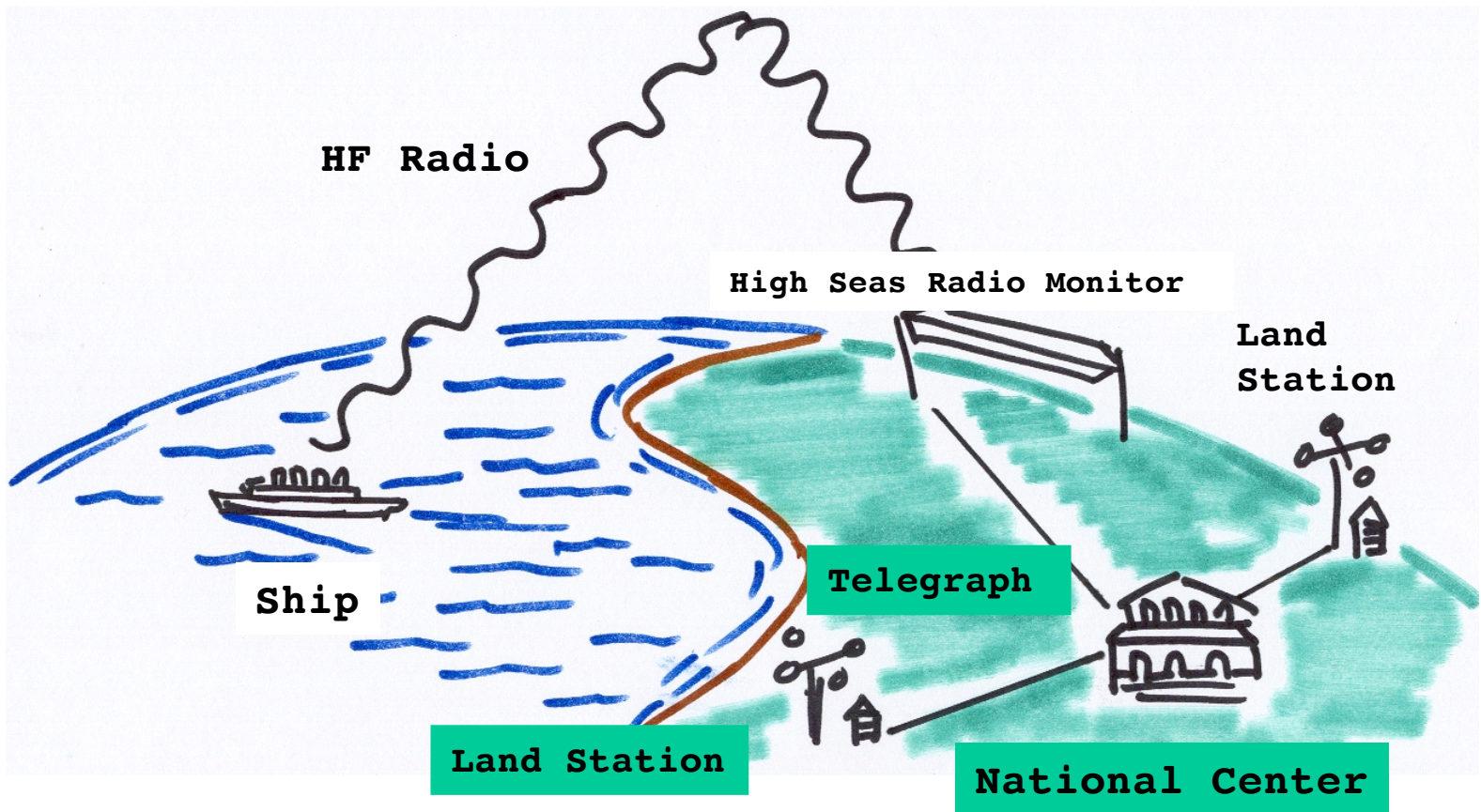


Is a salve to its history.

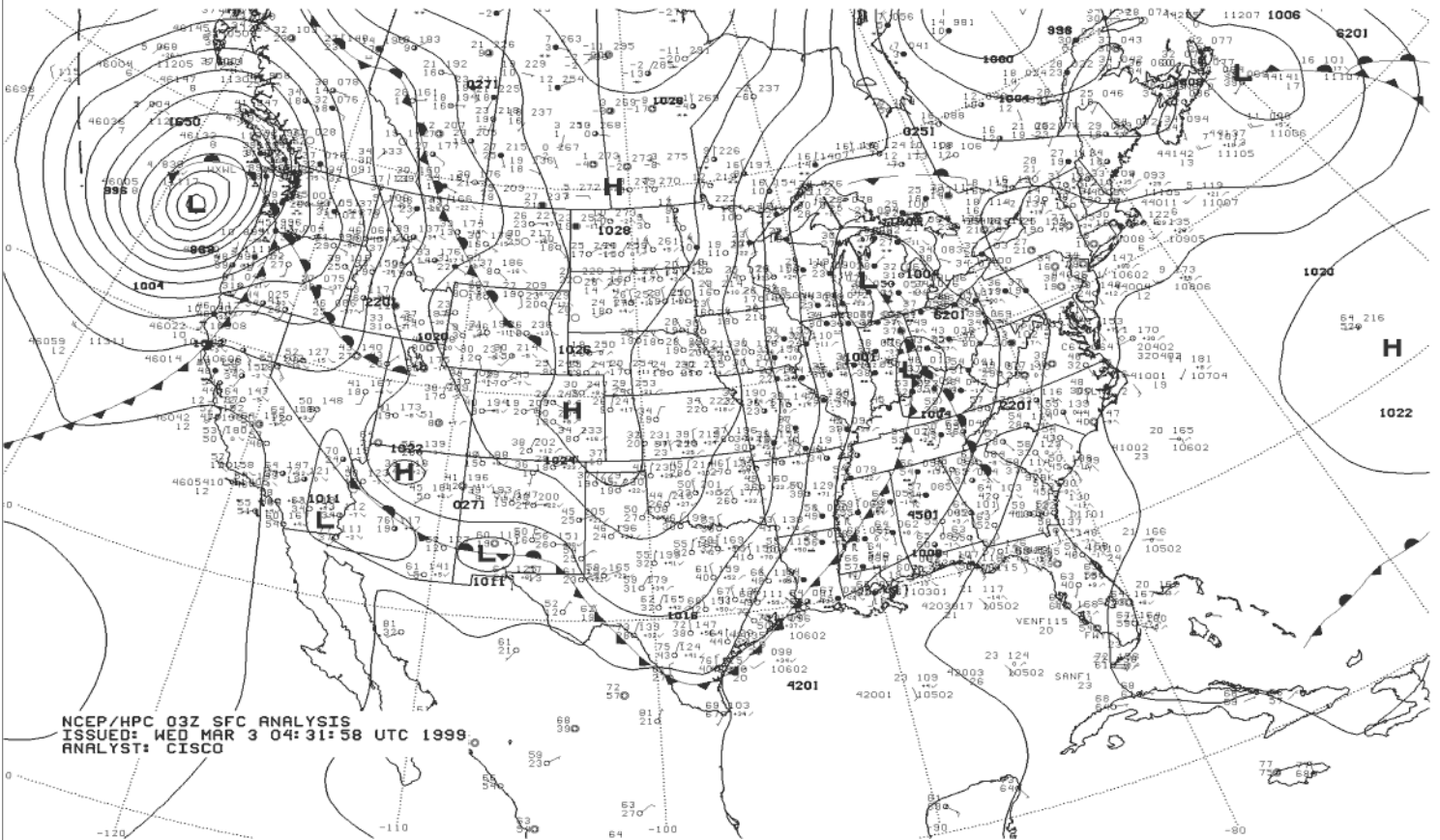
## Some History

- Land-line telegraph (1870s)
- Radio ship reports (1900s)
- Upper air observations (1930s)
- Reflectivity radar (1940s)
- Polar orbiting satellites &
- Barotropic numerical models (1960s)
- Geostationary satellites &
- Baroclinic numerical models (1970s)
- Doppler radar (1980s)
- Targeted observations &
- Coupled models (1990s).

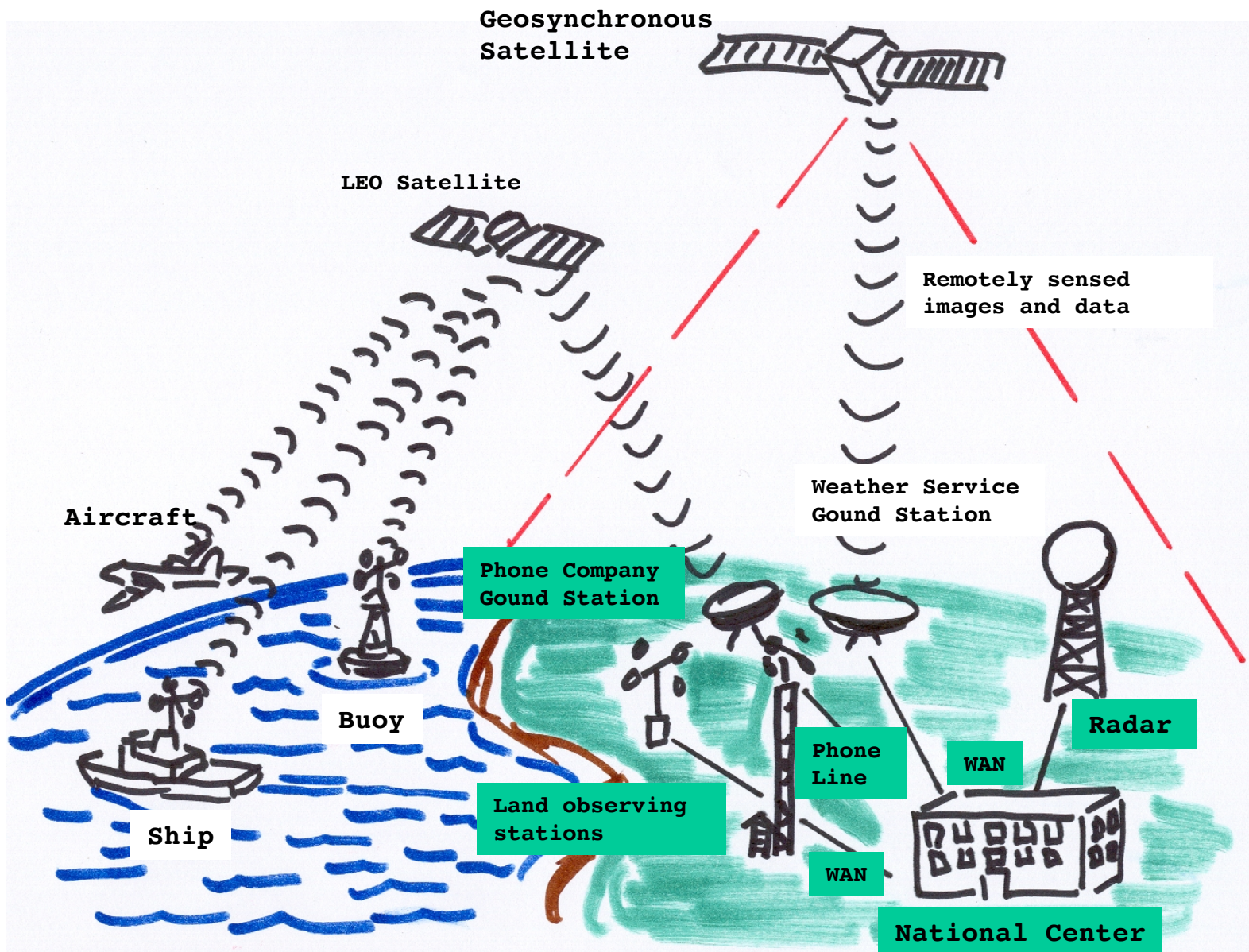
# Weather Communications in 1910



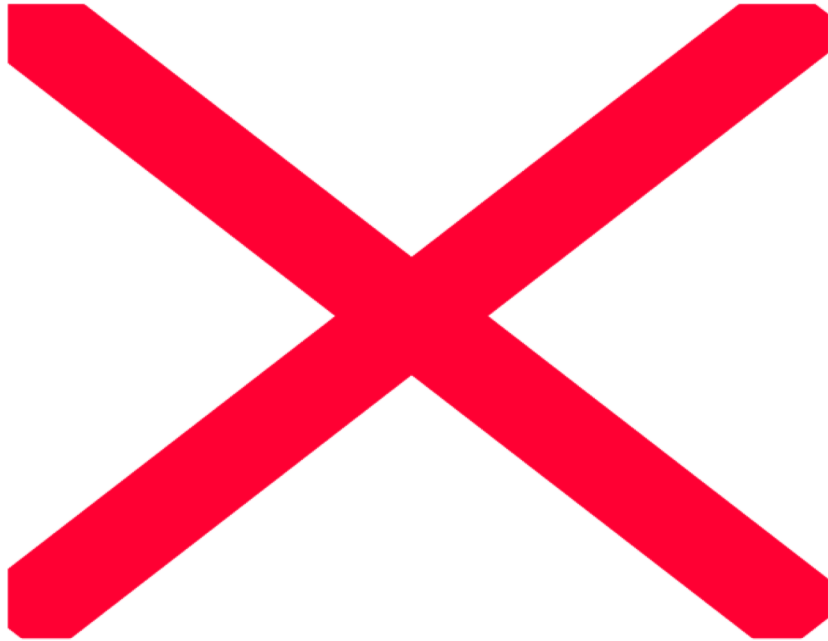
# Synoptic Weather Map



# Weather Communications in 2000



**Worldwide RAWINSONDE Ascents,  
September 2000**





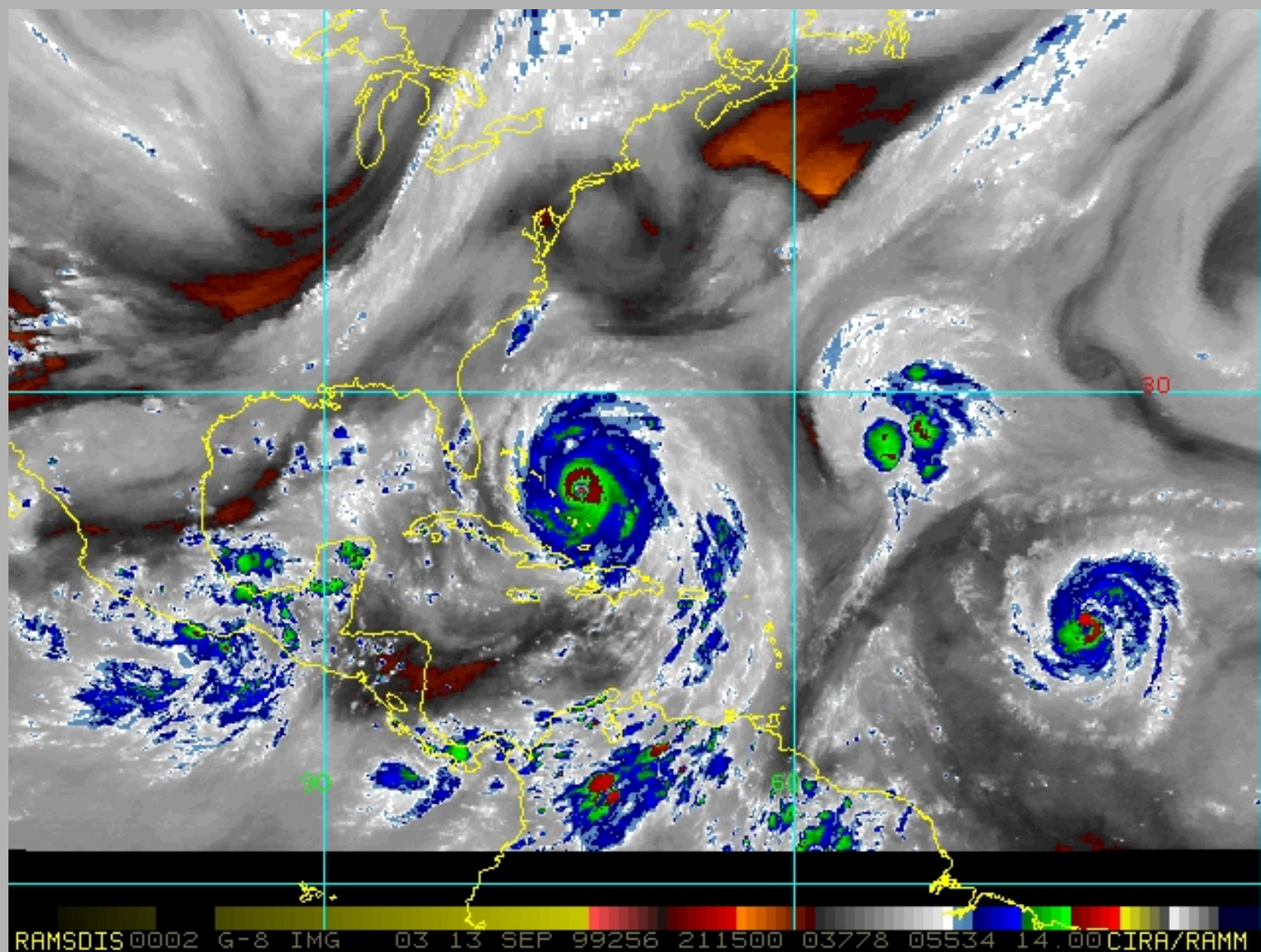


# Aerosonde

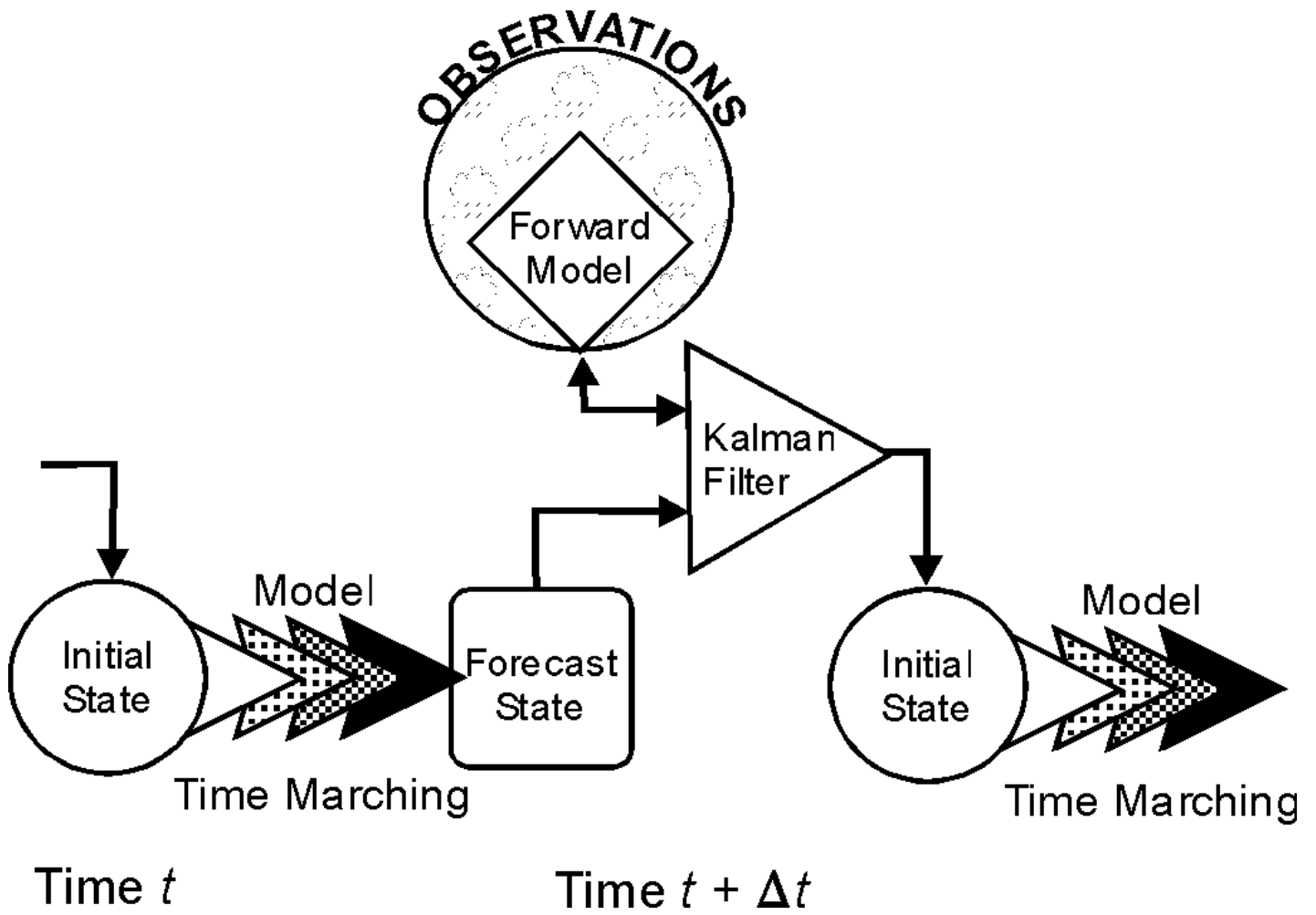
*Will rely on GPS navigation, satellite telephony & a tiny, turbo-compounded piston engine.*



# Water-vapor Image of Hurricane Floyd



# Optimal Data Assimilation



***Hurricane Floyd***



# Summary

**Many small (1-2Kb) observations transmitted from widely dispersed sites to analysis centers.**

**LEO telephony works well for mobile platforms.**

**High bandwidth (1-100 Mb) analyses forecasts and animations from center to field.**

**No one-to-one correspondence between observation sites and data users.**

**“Forward interpolation” data analysis is starting to require more field-to-center bandwidth.**

**Thank you for your  
attention.**

**Questions?**

