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Choosing a radar wavelength X-band vs C-band vs S-band

Types of Atmospheric Radars



Airborne x-band

Mobile radars x-band



Rachel Humphrey, 2009

Mobile radars C-band



S-band



Decide on highest priority for radar use

- Rainfall estimation
- Snowfall estimation
- Severe storm warnings
- Mobile radar for weather modification or research
- Gap filler radar in a larger network
- Part of a national network

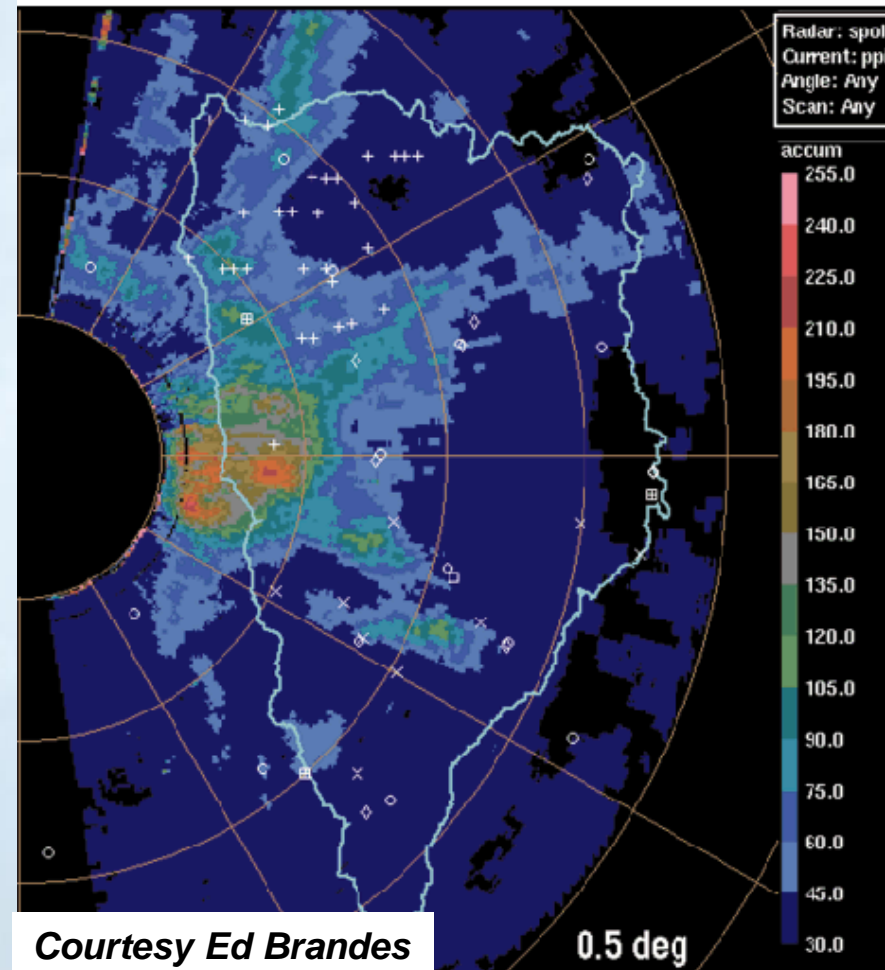
Type of radar

- Doppler a must
- Dual wavelength desirable especially if C- or X-band and want to estimate rainfall

Rainfall Estimation

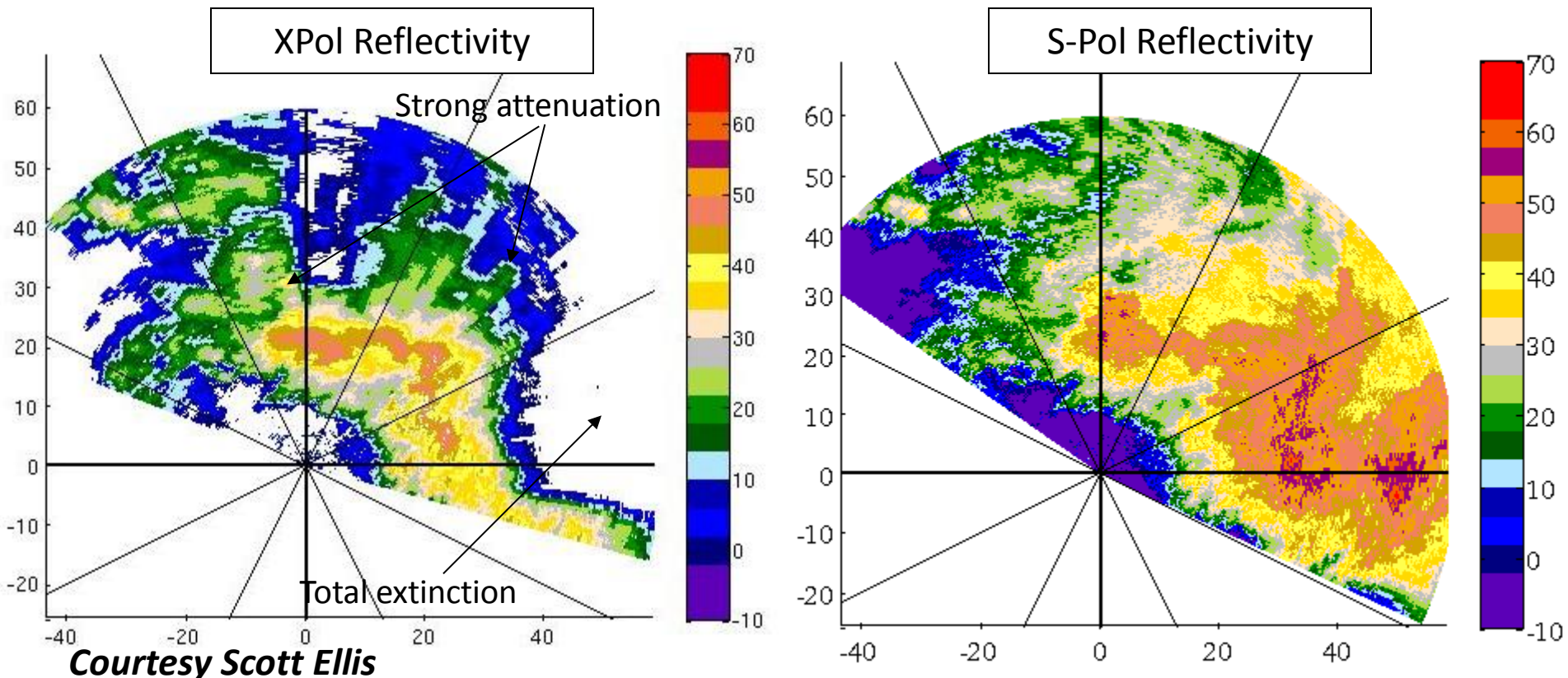
1. S-band clear winner
2. C-band with dual wavelength capability
3. C-band with attenuation correction
4. X-band only if have a dense network
5. with < 30 km spacing

**Andover, Kansas Flash Flood
13 June 1997
R (K_{DP}): 0120 - 1530 UTC**



Precipitation Attenuation

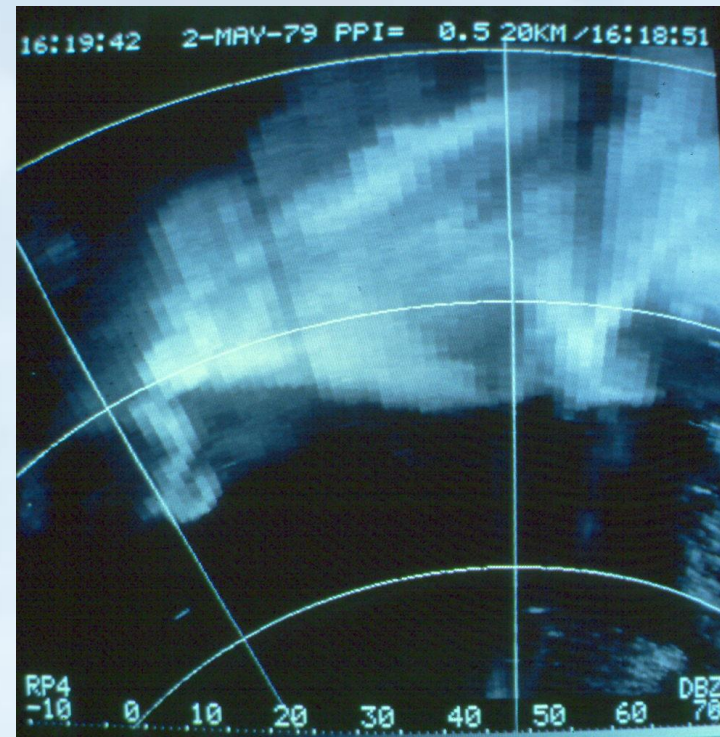
- Nearly simultaneous X- and S-band reflectivity through heavy rain



Severe Storm Warning



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1. S-band
2. C-band
3. X-band only if a dense network with <30 km spacing



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Mobile radar for research or weather modification

1. C-band
2. X-band





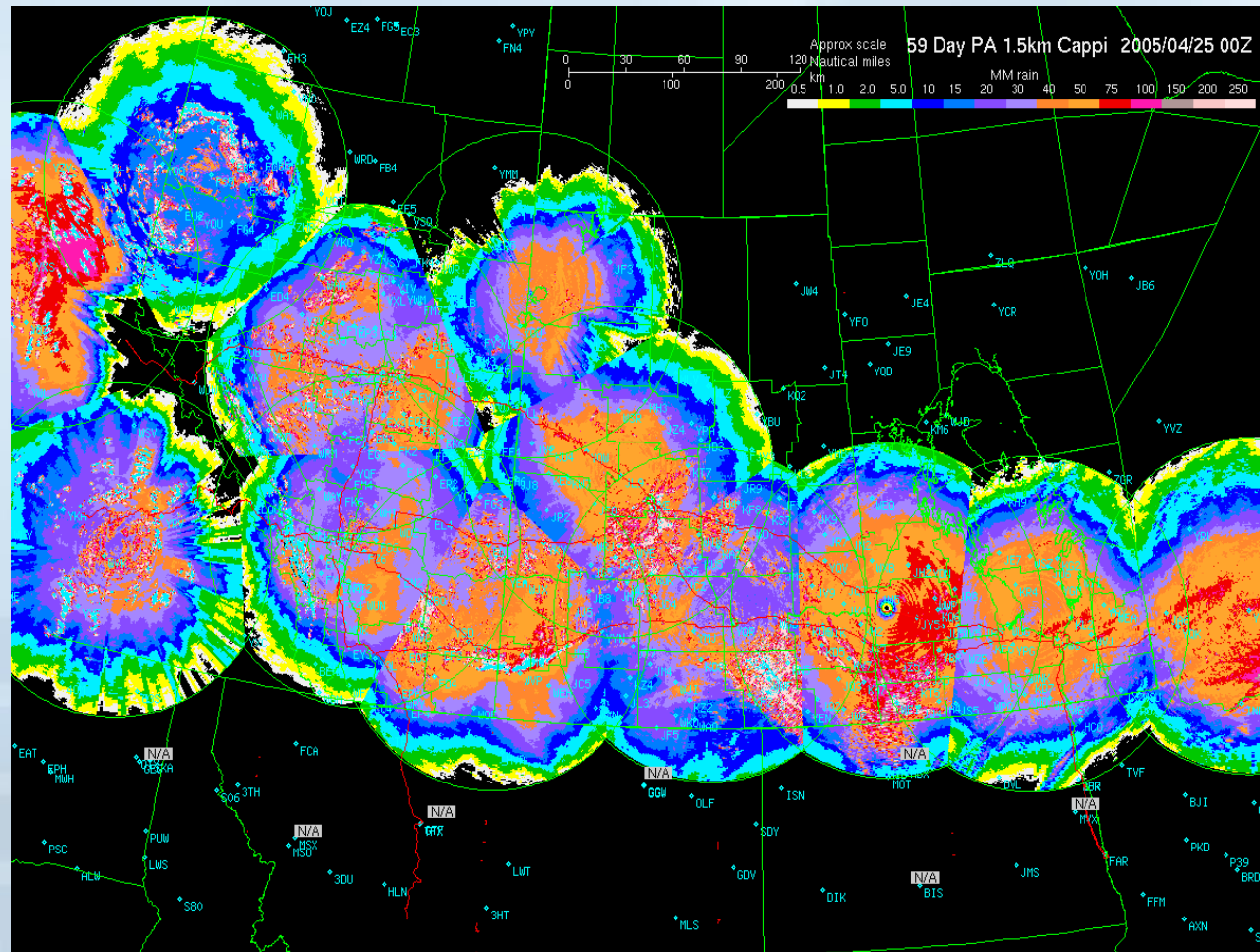
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Gap filler radar in a larger network

1. X-band particularly in complex terrain

Part of a national network

1. S - band
2. C- band
3. X – band only if spacing < 30 km apart





Radar Specifications

- Beam width
- Sensitivity
- Wavelength
- Signal processor
- Software

Radar Siting

Get the advice of a experts; not one that sells radars

Do not buy a radar if there is not sufficient money for a local radar engineer or technician to maintain it