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Demystifying Spectrum - How will 1675-1680 MHz Spectrum Sharing Impact the Enterprise?

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Talking with Satellites at UNF

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- NOAA/EUMETSAT Satellite Signals at UNF
  - Provide unique real-time teaching aids
    - View satellite signals and their matching data products
    - Compare GOES DCS uplink data and downlink data simultaneously
  - Provide research opportunities
    - R&D for improvements to data transmission efficiency
      - DCS: True binary protocol, faster data rates, improved error correction, less overhead (reducing the sync header)
    - Short and long term studies of signal parameters
  - Display global weather data to UNF students
  - Provide a STEM experience for visiting young students

Spectrum Sharing: The Concept

- Does Spectrum Sharing work? Yes and No
  - It generally works well for a single application
    - Terrestrial Microwave
    - Cellular Communications
    - TV and Radio
  - There is some history of spectrum sharing not working as well when an attempt is made to mix applications in adjacent or co-channel spectrum
    - DSRC (connected vehicles) and "WiFi" at 5.85GHz
    - GPS and Lightsquared
    - Nextel and 800MHz Public Safety Radio

The Spectrum Sharing Situation Going Forward:

- We as a society have an insatiable need for fixed and mobile wireless broadband data and that need is growing
- Spectrum as a resource is expanding very slowly (as technology improves) but not at a fast enough pace
- "Issues" and interference incidents will likely become more and more common as the FCC and NTIA complete their work to find 500MHz for broadband and more spectrum is shared as a result.
- The industry is working hard to identify ways to share spectrum that can improve the efficiency of its use but it is a difficult task. DARPA has a $3.75M challenge open right now to work on this.

The Spectrum Sharing Situation Going Forward:

- The FCC has downsized, not increased, the number of spectrum enforcement offices
- They will not be able to be as responsive for assistance with interference and spectrum sharing issues as they once were
- In defense of our own use of spectrum we must meet this new reality by becoming good stewards of our own spectrum

The Spectrum Sharing Situation Going Forward:

- A Good Spectrum Steward should at a minimum:
  - Perform baseline and routine spectrum monitoring
  - Perform interference identification
  - Develop, evidence-based, metrics for deciding when interference is causing harm to your system
    - The FCC rules call out general definitions for interference
    - The rules fit well for clear instances of interference
    - They don't fit well for describing a loss of performance envelope or loss of capability that doesn't impact your system's performance at this moment