An Invisible Threat to the Weather and Water Community: Radio Frequency Spectrum Access

Write to FCC to share info about your reliance on real-time data from NOAA's weather satellites

The nation relies on real-time information on weather and water hazards from an important mix of government, academic and private sector partners. These organizations rely heavily on radio frequency spectrum to sense the atmosphere and transmit lifesaving information from environmental satellites, weather balloons, ocean buoys and river/stream gauges. However, the area of spectrum that is in use by these technologies every day is in high demand by emerging wireless technologies.

The radio frequency spectrum that environmental technologies rely on to accurately transmit their life-saving information is at risk. See the next page to learn how to help save our forecasts.

What is spectrum and why does it matter?

Wireless radio frequencies are the "oxygen" that carries information from one electronic device to another ranging from cellular phones and tablet computers to key fobs that open car doors. Spectrum is the enabler for an array of crucial functions, including the communication from environmental satellites, weather balloons and buoys, operation of weather radars, as well as emerging consumer technologies across the globe. Spectrum is a finite resource, yet renewable over time when users and uses change.

How is it that weather and water forecasts are at risk?

The current Administration has tasked the NTIA[1], working with the FCC, to free up 500 megahertz of Federal spectrum for wireless broadband use by 2020. Many of the spectrum areas being considered for reallocation are crucial to the current and next-generation environmental technologies that U.S. federal agencies, especially NOAA, have invested billions of dollars in to sustain and enhance weather prediction now and into the future.

Users of spectrum-dependent, real-time weather and water information are numerous and span many business sectors including:

- *general and commercial aviation*
- *land and maritime transportation*
- *energy generation and exploration*
- *aerospace operations*
- *agriculture & commercial fishing*
- *manufacturing*
- *retail*
- *outdoor recreation including sporting events (NFL, MLB, NCAA, etc.)*
- *most businesses in coastal areas, due to threat of flooding or storm surge*

Commercial interests, working with the FCC, are seeking to set up "sharing" arrangements between NOAA and the wireless broadband industry. **Such sharing arrangements are risky and unproven since they make crucial real-time environmental data downlinks from satellites and other technologies vulnerable to interference**, which can cause contamination of crucial data, disrupting forecast accuracy or delaying critical warnings, which have been shown to have considerable economic impact[2]. **Interference at the wrong moment can mean the difference between a timely, reliable weather warning being available with time for a citizen or industry to act - or not.**

While they have been created in prior spectrum auctions, "protection zones" for select federal government sites are expected to be provided to reduce or minimize interference. **Protection from interference is not planned to be afforded to state, local and tribal governments, nor to private sector and academic users** who all rely on real-time downlinks from these satellites to develop information that impact citizen decision making in hazard conditions.

What could the impact be?

One of the technologies that may be most affected includes:

- **NOAA's geostationary weather satellites – GOES-RSTU & GOES N-P**: Known as the nation's weather beacons in the sky, information from direct broadcast, for real-time information for weather forecasts, as well as relay of stream, river and coastal gauges, and wildfire weather data will be most impacted.

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[1] The National Telecommunications and Information Administration (NTIA) regulates spectrum use for federal government users, while the Federal Communications Commission (FCC) regulates spectrum for all domestic non-federal users, including state and local governments.

[2] Improved forecasts can potentially lead to significant cost savings in electric energy production. (Hertzfeld et al. "Weather Satellites and the Economic Value of Forecasts: Evidence from the Electric Power Industry." International Astronautical Conference. Bremen. 2003.)

Getting access to this information directly from the satellite by the fastest way is crucial for environmental predictions of hazards for both civil and federal government users.

One of the companies seeking urgent access to this area of spectrum (1675-1680 megahertz) is telling the FCC this direct broadcast can be replaced by cloud computing for all situations[3]. That is not the case. Getting GOES satellite information via the cloud between the satellite source and organizations that originate warnings will not work for users that rely on high availability "real time" information, which is crucial to tracking active weather and related hazards like tornadoes, hurricanes, wildfires, volcanic ash eruptions and floods. This is primarily because the "last mile" internet connectivity from the cloud to the end user is often disrupted during severe events when it is needed the most.

What is really at stake here? How serious is this?

Countless citizens across the nation rely on this spectrum to get information for their daily forecast, especially in times of severe weather where minutes matter to people and property. **We cannot allow this technology or the hazard alerts we rely upon to be put at risk.**

Since the nation is preparing for the first launch of a new generation of geostationary weather satellites in the next few months, **now is not the time to make major changes to the spectrum critical to the availability of the real-time data from this system, which is critical to severe weather and flood warnings.** The GOES-R satellite series is expected to operate until 2036 and is a significant advance in technology and capability from past systems, producing about 15 times more real-time data than the current system. Its increased capability will allow new, different and more capable products, many of which will be important to transmit in real-time via direct broadcast in this spectrum to get enhanced information to hazard forecasters protecting people and property. It is also difficult for the future users of the GOES-R satellite series to comment on the full operational potential of this satellite before its launch later this year given the extent of its capabilities and how different they are from existing satellites. **But it is important that users comment to the FCC about their present and anticipated future use of this crucial real-time hazard information resource.**

If the proposed spectrum sharing is allowed to proceed, interference is highly likely from terrestrial-based signals that are much stronger than those emitted from this satellite, which will likely disrupt critical important real-time information, particularly to non-government users.

What is happening on this now? When is the timeline for action?

- On April 22, the FCC released a public notice seeking comment on a wireless company's request to share the 1675-1680 MHz band with current government users of these bands. The public notice is available at bit.ly/FCCGOESPublicNotice. **Comments are due no later than June 21, 2016.**
- The FCC has specifically requested comments from companies and other entities that could be impacted by interference in getting real-time information from environmental satellites, ocean buoys and river/stream gauges. **The FCC needs input from users who rely on real-time weather and flood forecasts, but also from industries who develop forecasts and other products used in urgent hazard situations to keep people and property safe.**
- It is crucial for the FCC to hear a strong message from concerned citizens, industries and universities about the serious impacts of these decisions on real-time forecasting and preparedness.

What can I do about this? What can my company do about it?

- Share your views in a letter submitted in the following FCC proceeding: Petition for Rulemaking RM-11681. Instructions for submission online are located at bit.ly/FCCfilingtips. Be sure to cc your letter to your local Members of Congress and U.S. Senators, which can be found via whoismyrepresentative.com.
- A website is being developed that will provide more information, including sample letters, to get you started in writing to the FCC. To be notified when this website is ready, email action@saveforecasts.org to get updates on these issues.

[3] bit.ly/LightSquaredExParte is a link to a filing on February 9, 2016 by Ligado, LLC (formerly known as New LightSquared LLC).