



Geoscience and Remote Sensing Society

July 30, 2021

The Honorable Eddie Bernice Johnson
Chairwoman
The Honorable Frank Lucas
Ranking Member

Committee on Science, Space and Technology
United States House of Representatives
Washington, DC 20515

Dear Chairwoman Johnson and Ranking Member Lucas,

Thank you for your ongoing leadership to preserve diverse spectrum resources to sustain and advance crucial environmental information and forecasting. We appreciate that you continue to focus on these important issues, and we listened with great interest to the hearing titled, "Spectrum Needs for Observations in Earth and Space Sciences". We appreciate that you called on the GAO to investigate the actions of the FCC when they auctioned crucial spectrum adjacent to weather forecast bands in 2019.

The importance of responsible stewardship in management of spectrum resources has been well documented. The various uses and management of the spectrum for national security, economic development, public safety, meteorological, and scientific purposes have been touched upon within the hearings of July 20th. This has also been the topic of many conversations that have taken place over the last decade and beyond among those who are actively engaged in the business of domestic and international spectrum management.

Some people have expressed the opinion that in order for spectrum sharing to work, greater investment in innovation is required across disciplines, including engineering and economics, to enable different technologies to safely coexist. Other people have highlighted that investment in engineering staff and travel budgets are necessary, particularly in the U.S. State Department. The GAO Report recommends that clearer definition of agreements between the FCC and NTIA are needed with a more collaborative environment. We do not disagree with the comments and observations that have been furnished by others, but we will contribute a somewhat parallel view that augments what has already been provided.

The IEEE Geoscience and Remote Sensing Society (GRSS) is a professional society of the Institute of Electrical and Electronics Engineers (IEEE), active in the fields of geoscience and remote sensing. The IEEE GRSS deals with the theory, concepts, and techniques of science and engineering as they apply to the remote sensing of the Earth, oceans, atmosphere, and space, as well as the processing, interpretation, and dissemination of this information. The work of remote sensing scientists and engineers can be somehow considered as the foundation on which meteorology is built upon. The data that meteorologists and climate scientists use in their models are measured by sensors that are designed and built by remote sensing scientists and engineers. The accuracy of weather forecasts and warnings, derived from those models, would be degraded by contamination of passive measurements. Impacts to the accuracy of such forecasts can affect the safety of life and property and have economic consequences in each state of the U.S. and every nation of the world. To date, there are no available technologies to fully remove the harmful effect of interference from remote sensing measurements, and the resulting error impacts the quality of meteorological analyses based on such measurements.

Therefore, all efforts should be made to protect from interference the frequencies used for remote sensing, including, but not limited to, the 24 GHz band. The members of our professional society are intensely involved in addressing the issues that impact the effective understanding of the Earth geophysical processes and the scientific use of the microwave spectrum. Clearly identifying the problems affecting the current situation is crucial to crafting solutions that will improve it. We are concerned that taking actions which do not address the underlying causes will have a two-fold negative effect: 1) the current problems will resurface, albeit in a few years, and 2) there will be little desire to revisit this topic for many years to come.

As was related during the hearing by the witnesses, the current U.S. spectrum management structure has been largely the same for the last 100 years and by all accounts of available observers, the process worked well and collaboration among all participants, while not always harmonious, was always cordial and effective. However, the four years leading up to WRC-07 were different. WRC-07 dealt with the issue of regulating out of band emissions into a number of radio frequency bands (including the 24 GHz band) utilized for Earth observation and scientific purposes. In 2004, the FCC held its first auction of bands adjacent to the 24 GHz bands. To all engaged observers it was - and is - clear that spectrum to be auctioned is more valuable when unencumbered by technical restrictions. At the insistence of the FCC, the U.S. took the position at WRC-07 that recommended limits were all that were necessary to protect the operations of passive services. At WRC-03, all other involved administrations took the position that enforceable mandatory limits were needed rather than un-enforceable recommended limits. In a compromise by the attendees of the WRC, WRC-03 Resolution 750 was adopted where some of the passive bands were protected by mandatory limits and the others were in a table where recommended limits were identified. WRC-03 established two widely known realities: 1) the U.S. would always take a position contrary to passive microwave interests in international regulatory proceedings in the ITU-R and CITELE and 2) the U.S. would propose methods to satisfy protection of passive microwave interests far below any other proposed methods in an effort to push the compromised result as beneficial as possible toward commercial broadband usage. This reality regarding U.S. spectrum policy has continued from WRC-03 to the present.

Many years ago, managing spectrum appeared easy and different organizations could work together to solve the few problems that surfaced. The NTIA was established under the Department of Commerce as a result of the Reorganization Plan Number 1 (1977) implemented with Executive order 12046 (1978). Prior to that reorganization, the functions of the NTIA existed as the White House's Office of Telecommunications Policy (OTP). After the reorganization, the relationship between the State Department, FCC, and the NTIA continued much the same as before, with a relatively balanced decision making between the NTIA and the FCC. However, this situation deteriorated when spectrum auctions were introduced and as spectrum matters became more complex. Perhaps the NTIA, in our opinion and others, was directed to cooperate with the FCC in all regulatory matters, or its past leadership may have decided, without any higher direction, to accede to FCC decisions; in any case, the end result appears to be that federal agencies coordinating their views on domestic and international rule makings find that NTIA does not always voice their concerns or fully represent their interests in a timely manner. We believe that it is clear that the leadership provided by the NTIA to its constituent federal agencies has eroded perceptively and steadily since WRC-03.

The current circumstances of the State Department are of major concern. We believe that State is woefully understaffed and needs to replace strong and experienced spectrum leadership which has departed in recent years. It is our opinion that its reduced staffing has contributed to the current situation where, regarding international regulatory matters, the State Department often defers to the FCC. In the past, U.S. delegations to ITU-R meeting were led by appointed Chairs from agencies and industry with the State Department present to provide guidance when necessary. Currently, the State Department cannot provide that level of involvement. Therefore, the FCC has filled that vacuum left by the State Department and, in our opinion, has become the defacto Chair, directing all U.S. actions at international regulatory meetings.

We are unable at this time to offer comprehensive proposed solutions to rectify this un-even balance of power between the FCC and the NTIA and its constituents; however, one clear action necessary is that the staffing situation at the State Department must be addressed as soon as possible. NTIA's role as an advocate for the federal agencies is more important than ever. In the 24 GHz case, neither regulator appeared to strongly decide in what was best for the American people. We recommend that further discussions be held to consider comprehensive actions to address the concerns that have been raised.

We also believe the spectrum management process for both domestic and international situations, is a stove-piped effort, with inadequate outreach beyond the spectrum world to the affected parties and stakeholders. Better communication between agency spectrum managers and scientists and affected stakeholders is drastically needed. Scientific input into spectrum regulatory decisions and an effort by FCC to bring in outside scientific expertise before making decisions has become absolutely necessary.

We believe that there are many unknowns associated with the speed and density of the rollout of 5G infrastructure in the millimeter wave bands. The likelihood of contamination of a passive band from adjacent band emissions is quite high, even with the limits negotiated by the spectrum experts supporting the ITU WRC-19 and for future regulatory determinations.

We welcome both of your leadership as Chairwoman and Ranking Member of the U.S. House Committee on Science, Space and Technology to advance environmental forecasting and hazard prediction, which can only happen if existing spectrum assets in key passive bands are protected from interference. We are looking to you for continued support in the following areas:

We appreciate your continued attention to this issue, and we hope the full Committee's focus on this issue will continue. We believe ongoing dialogue about the structure and relationship between the State Department, FCC, and NTIA is necessary to ensure that scientific voices are fully heard within spectrum allocation proceedings. We strongly urge that scientists, who fully understand the passive measurement technology and how it differs from communications technology, be made full participants in any FCC decision.

We look forward to working with both of you on these critical issues regarding microwave observations by Earth and space sciences.

Sincerely,

A handwritten signature in black ink, appearing to read 'David Kunkee', written in a cursive style.

David Kunkee
2021 IEEE-GRSS President