ITU Symposium on ICTs,
the Environment and Climate Change

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Radiocommunication to monitor climate changes

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International Telecommunication Union

Committed to connecting the world

UN and Earth monitoring

- "United Nations agencies have acknowledged the importance of spacebased technologies for monitoring the Earth's climate system" (B.Ki-Moon, UN SecGen)
- WSIS action plan: Establish monitoring systems, using ICTs, to forecast and monitor the impact of natural and man-made disasters.

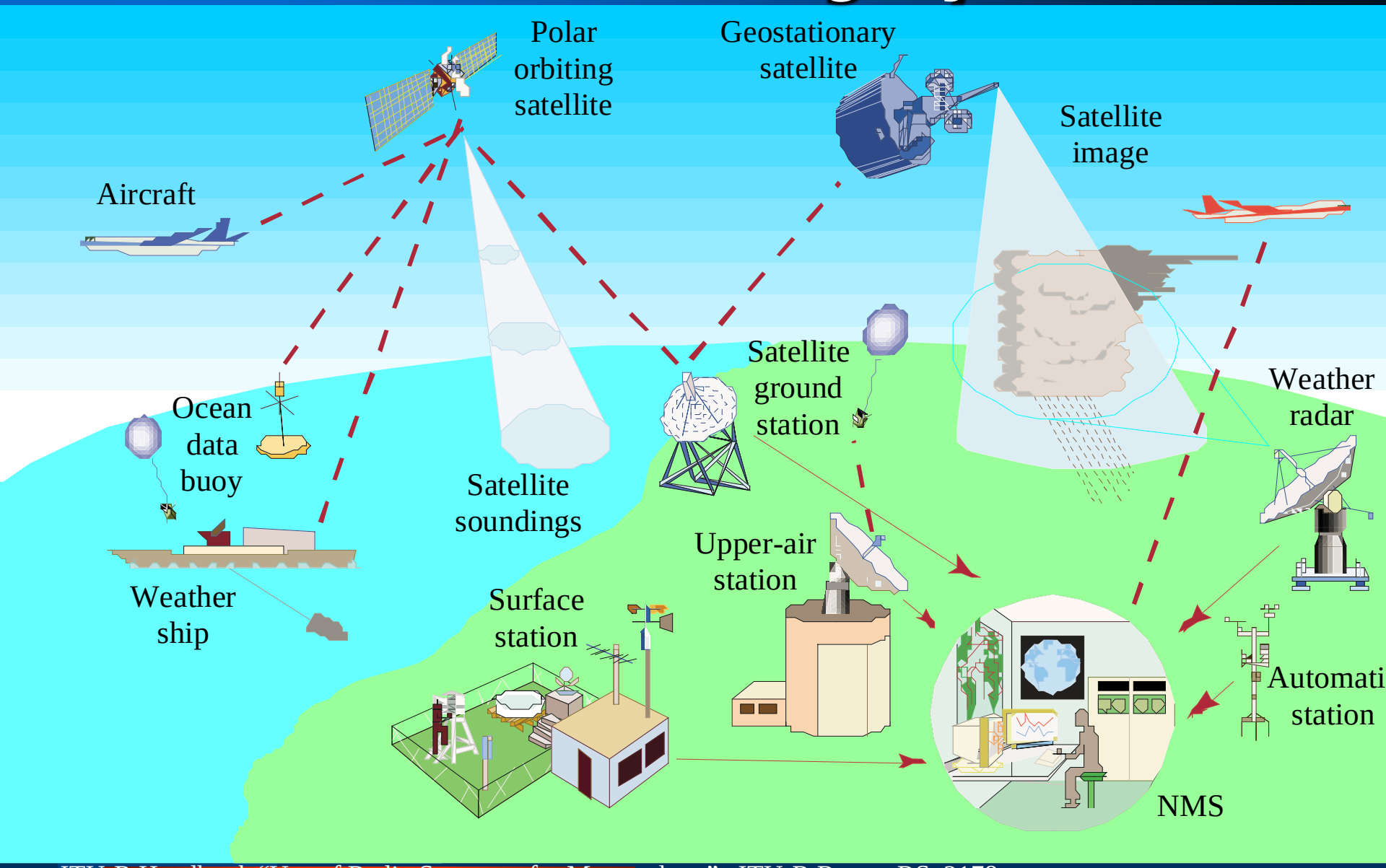
Radiocommunication Services and Remote Sensing (1)

- Remote sensors are the only tools that provide environmental data on a long term, repetitive and ***GLOBAL*** scale
- Radiocommunication systems based on remote sensing play the major role in weather and climate prediction
- Remote sensing is the essential tool for disaster prediction, detection, disaster mitigation and planning of relief operations
- Sensors are used for detection and tracking of earthquakes, tsunamis hurricanes, typhoons, floods, fires, oil leaks, dangerous pollution, etc.

Radiocommunication Services and Remote Sensing (2)

- Remote sensors are the basis of meteorological and Earth exploration-satellite services
- Operated in the main by governments and international agencies (NASA, ESA, CNES, ISRO, NOAA, METEOSAT, etc)
- Data collected by active and passive sensors are distributed worldwide in the *Global Observing System* (GOS) and used to benefit humanity as a whole

Global Observing System



- **Most people know that Meteorology and Earth observations are important …**

… but they are much less aware that these activities are fully dependent on radio-frequencies

"No spectrum, no global observations !"

(ITU Statement in a side event during Cancun UNFCCC)

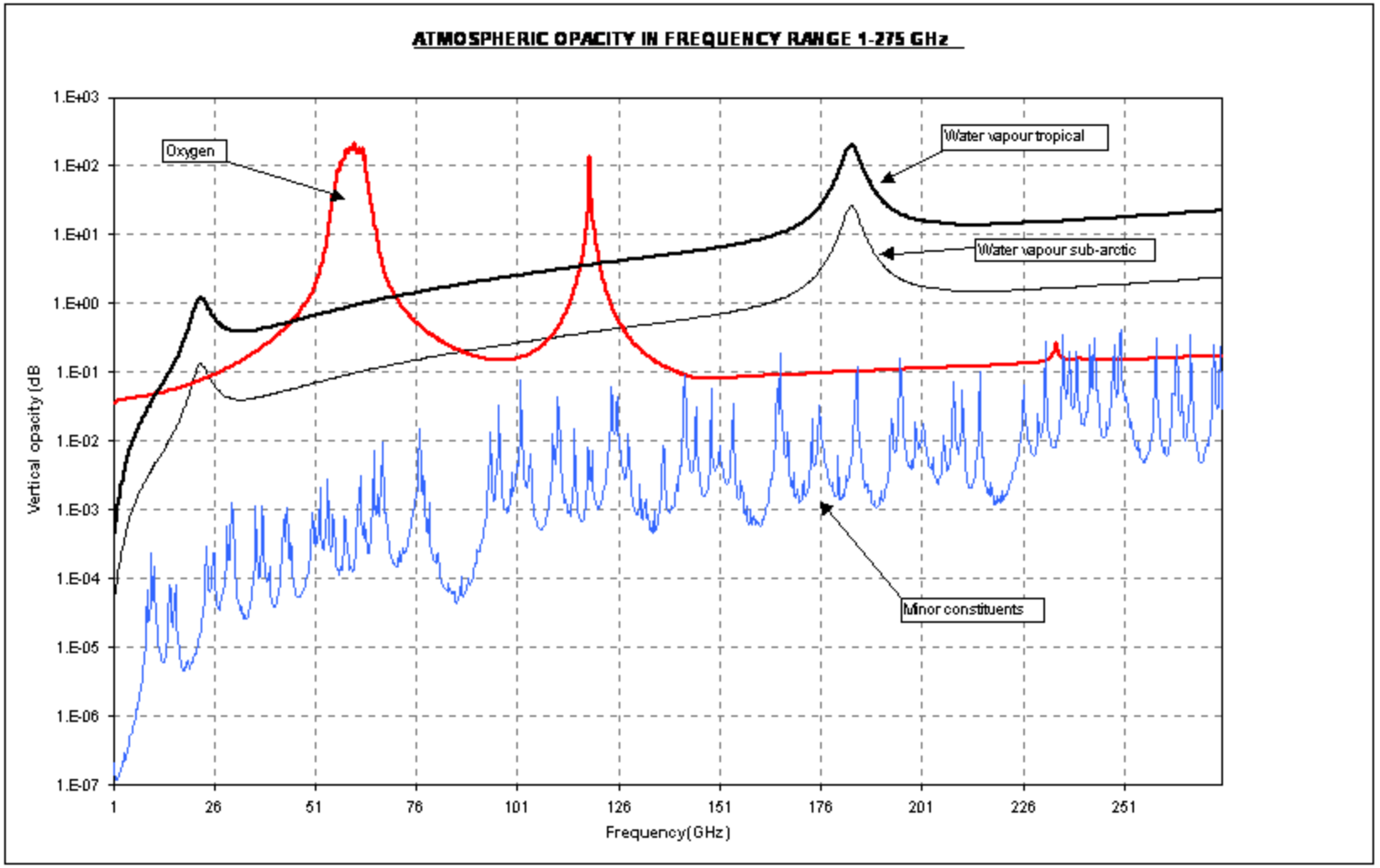
Radio Regulations and Sensors

- **No. 1.182** *active sensor*: A measuring instrument in the *earth exploration-satellite service (EESS)* or in the *space research service* by means of which information is obtained by ***transmission and reception*** of *radio waves*.

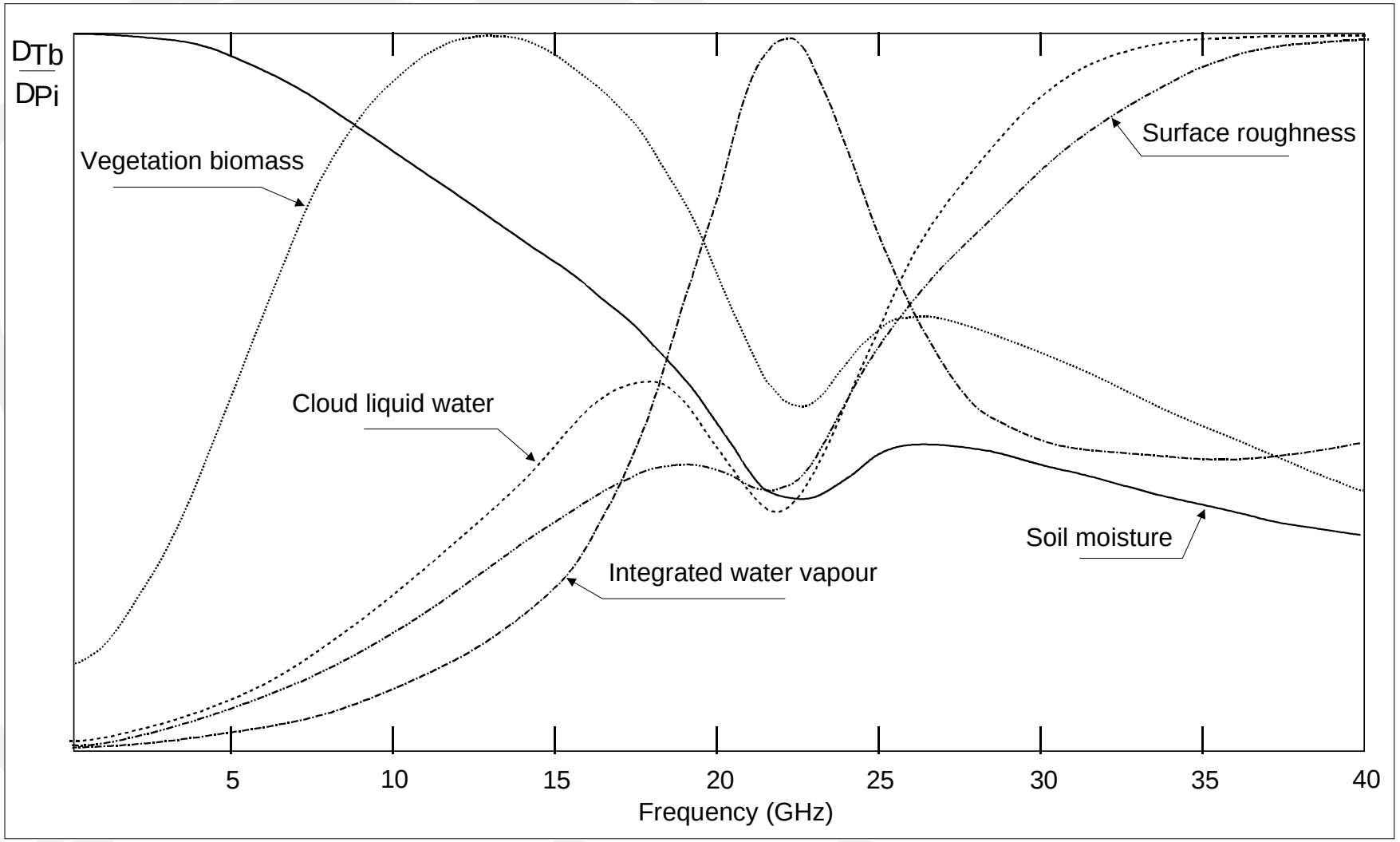
- **No. 1.183** *passive sensor:* A measuring instrument in the *earth exploration-satellite service* or in the *space research service* by means of which information is obtained by ***reception*** of *radio waves* of natural origin.

  - ***Article 1 of the Radio Regulations***

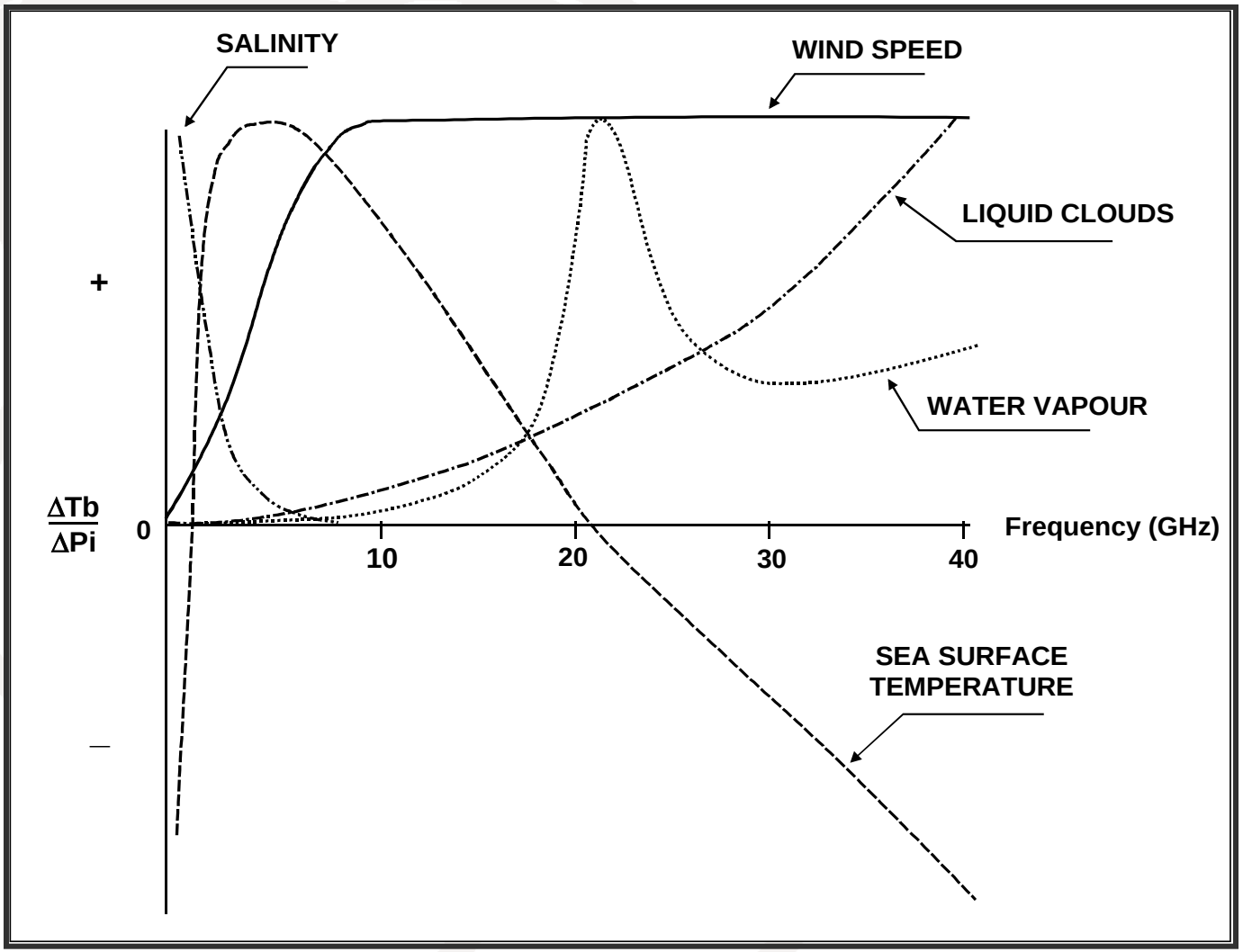
Passive Sensors observe through the atmosphere



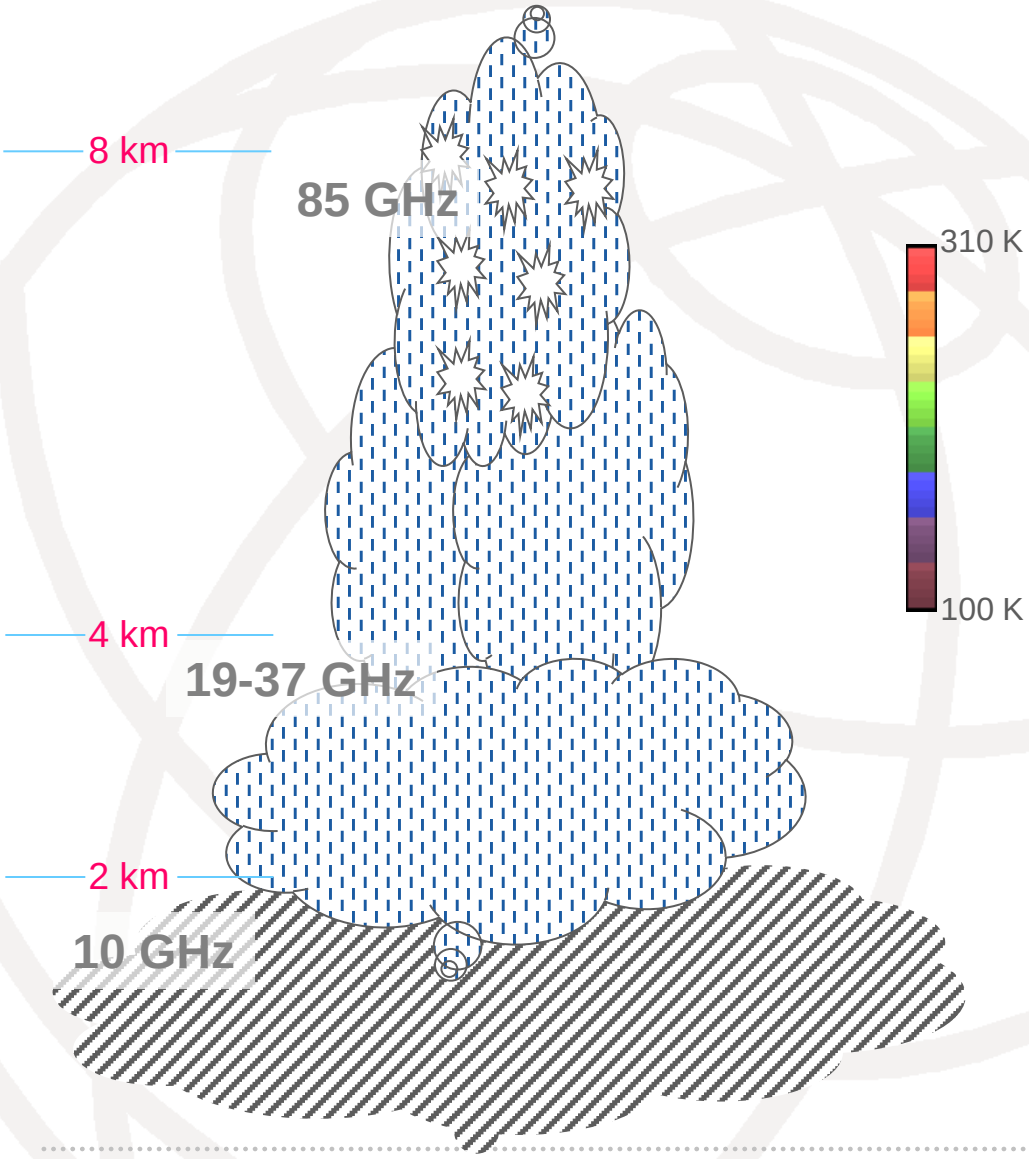
Microwave Spectrum Spectral Sensitivity to Environmental Parameters: Land Surface

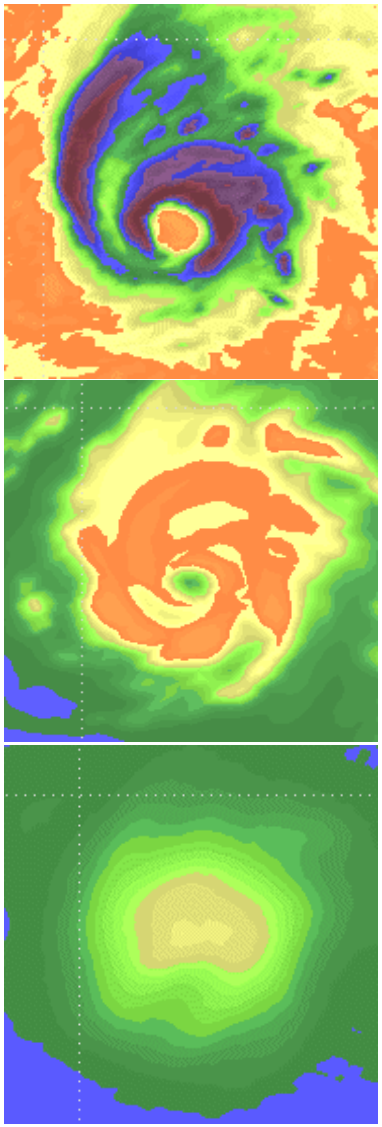


Microwave Spectrum Spectral Sensitivity to Environmental Parameters: Ocean Scene



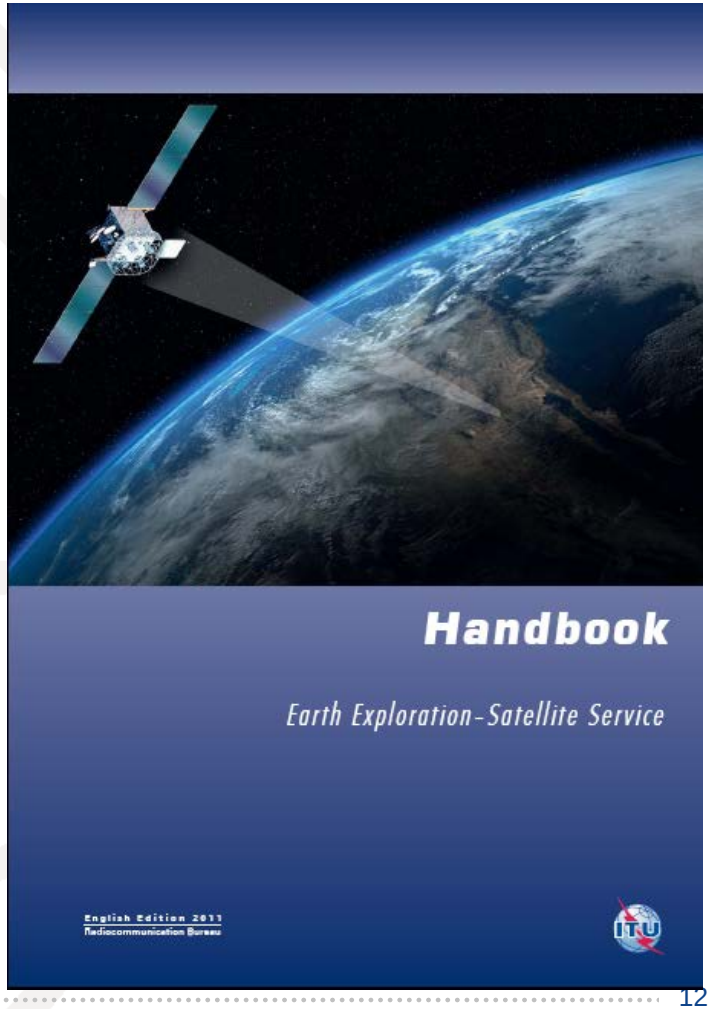
Sensitivity of different frequencies to Tropical Cyclone Rain





Technical aspects of Earth observation

- Development of EESS systems.
- Basic definitions, technical principles and applications
- To assist States in spectrum planning, engineering and deployment aspects



http://www.itu.int/pub/R-HDB-56

EESS info 1

- **WP 7C** of ITU-R Study Group 7 is responsible for studies related to Remote Sensing systems including ***EESS*** - more info at: http://www.itu.int/ITU-R/
  - Studies on the **EESS** are very active
  - Sharing and protection criteria have been intensively investigated for existing spectrum allocation for **EESS**
  - Studies are also on-going for newly allocated bands (results of WRC-12) for future enhancements and newly planned **EESS** systems, addressing frequency sharing with other services
  - These studies contribute not only to the development of ITU-R **RS** Series Recommendations but also to WRC-15 preparation

EESS info 2

- ***Some examples of ITU-R Recommendations and ITU-R Handbook related to EESS***

- **Handbook on EESS – ITU-R HDB-56**

- **RS.515** - Frequency bands and bandwidths used for satellite passive sensing
  RS.577 - Frequency bands and required bandwidths used for spaceborne active sensors operating in the EESS (active) and space research (active) services
- **RS.1883** - Use of remote sensing systems in the study of climate change and the effects thereof

  - *FREE online access to current ITU-R Recommendations until further notice* at:
    http://www.itu.int/rec/REC-RS/en

Conclusions

- **ITU** is committed to working with other organizations in combating climate change
- Earth observations totally rely on **radio-frequencies** to be harmonised and protected
- Earth observation value *can not be measured only in financial terms*, as it prevents large losses of lives or promotes sustainable development in a global scale.

International Telecommunication Union

Photo credit: ITU, Shutterstock

ITU Seminar for Americas Region

Science services: regulatory technical and practical implications

www.itu.int/ITU-R/go/itu-sem-americas/

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Questions ?