

# Realizing the promise of Space Technology for Sustainability Presentation to Scientific and Technical Subcommittee: 2019



VIENNA | February 19, 2019

# Realizing the promise of Space Technology for Sustainability: SDGs



Realizing the promise of Space  
Technology for Sustainability:  
Making Big Data actionable on a daily  
basis

# Remote Sensing is “Big Data!”



However, Remote Sensing is currently **not** Actionable on a Daily Basis. Why?

**Because it lacks  $H^3$ !**

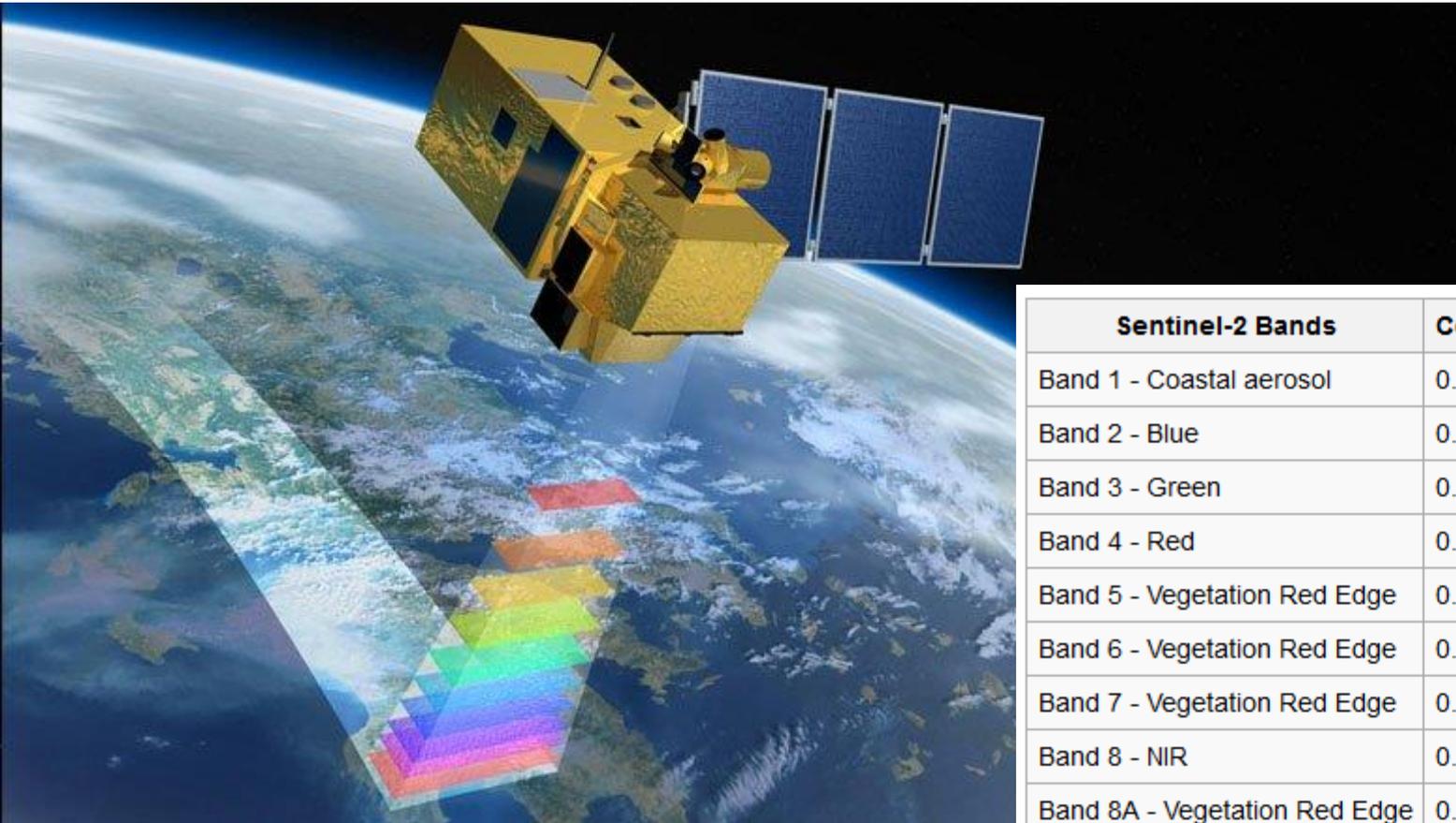
**(High spatial, temporal and spectral resolution)**

# NASA's LandSat 8 lacks H<sup>3</sup>



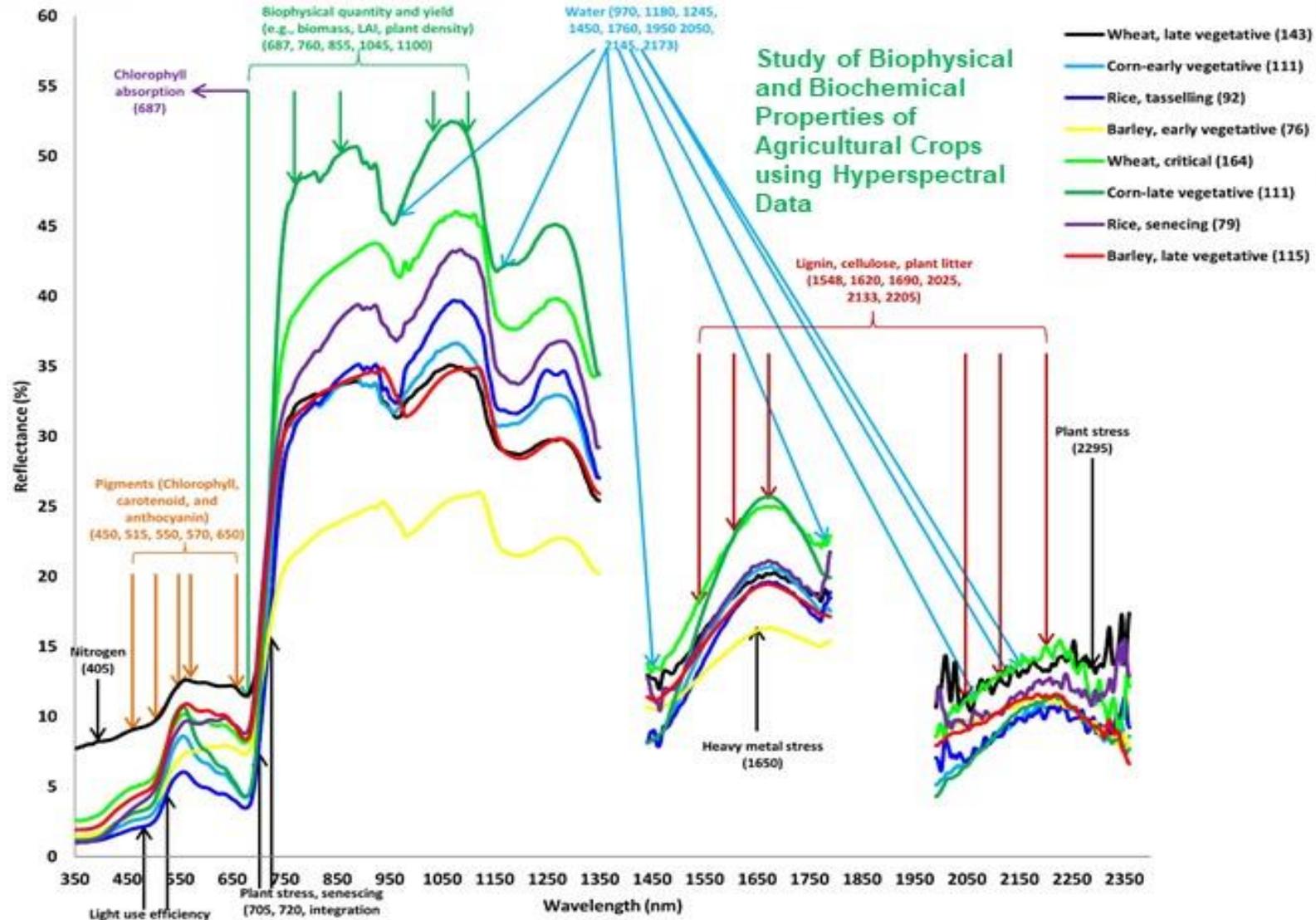
	Bands	Wavelength (micrometers)	Resolution (meters)
<b>Landsat 8 Operational Land Imager (OLI) and Thermal Infrared Sensor (TIRS)</b>  <b>Launched February 11, 2013</b>	Band 1 - Coastal aerosol	0.43 - 0.45	30
	Band 2 - Blue	0.45 - 0.51	30
	Band 3 - Green	0.53 - 0.59	30
	Band 4 - Red	0.64 - 0.67	30
	Band 5 - Near Infrared (NIR)	0.85 - 0.88	30
	Band 6 - SWIR 1	1.57 - 1.65	30
	Band 7 - SWIR 2	2.11 - 2.29	30
	Band 8 - Panchromatic	0.50 - 0.68	15
	Band 9 - Cirrus	1.36 - 1.38	30
	Band 10 - Thermal Infrared (TIRS) 1	10.60 - 11.19	100
	Band 11 - Thermal Infrared (TIRS) 2	11.50 - 12.51	100

# So does ESA's Sentinel 2!



Sentinel-2 Bands	Central Wavelength ( $\mu\text{m}$ )	Resolution (m)
Band 1 - Coastal aerosol	0.443	60
Band 2 - Blue	0.490	10
Band 3 - Green	0.560	10
Band 4 - Red	0.665	10
Band 5 - Vegetation Red Edge	0.705	20
Band 6 - Vegetation Red Edge	0.740	20
Band 7 - Vegetation Red Edge	0.783	20
Band 8 - NIR	0.842	10
Band 8A - Vegetation Red Edge	0.865	20
Band 9 - Water vapour	0.945	60
Band 10 - SWIR - Cirrus	1.375	60
Band 11 - SWIR	1.610	20
Band 12 - SWIR	2.190	20

# Why is Hyperspectral Imaging So Important?



# Sustainability requires a Global H<sup>3</sup> Remote-Sensing Solution!



## CANEUS Vision:

UN-partnership for High spatial resolution, Hyperspectral Satellite Constellation with daily Global Coverage



# Why should the UN coordinate the H<sup>3</sup> Remote-Sensing Solution?

**Because access to Actionable Information is  
a fundamental right for Humans and Nations!**



## Goal 11

“Ensure that all countries have access to and develop the capacity to use all types of **space-based information** to support the **full disaster management cycle.**”





	Earth Observation	Satellite Navigation	Satellite Communication	Space Exploration	Planetary Defence	Space Education	Space Law
SDG 1: No poverty							
SDG 2: Zero hunger							
SDG 3: Good health and well-being							
SDG 4: Quality education							
SDG 5: Gender equality							
SDG 6: Clean water and sanitation							
SDG 7: Affordable and clean energy							
SDG 8: Decent work and economic growth							
SDG 9: Industry, innovation and infrastructure							
SDG 10: Reduced inequalities							
SDG 11: Sustainable cities and communities							
SDG 12: Responsible consumption and production							
SDG 13: Climate action							
SDG 14: Life below water							
SDG 15: Life on land							
SDG 16: Peace, justice and strong institutions							
SDG 17: Partnerships for the goals							

# Sustainability Example: Precision Agriculture



- 100% more food, fuel and fiber needed
- 70% increased output from technology-driven solutions
- Advanced Remote Sensing: Key Scalable Solution
- Existing Remote Sensing Inadequate
- Awareness and Adoption of Remote Sensing increasing rapidly



# Precision Agriculture: Early Warning is Critical!



- Remote-sensing can provide early warning of crop failure and impending famine
- Early Warning can provide sufficient preparation time for handling food security issues and preventing starvation and hunger-related deaths, population migration and terrorism

