Thematic Area 1 – Session
Polarimetric and Multi-frequency SAR Applications

Ake Rosenqvist (JAXA) & Magdalena Fitrzyk (ESA)

TA1 topics

- Soil Moisture (Laura Frulla, CONAE) [*Virtual]
- Forest & Biomass (Paul Siqueira, UMass) [*Virtual]
- Wetlands (Ake Rosenqvist, JAXA)
- Agriculture & Crop monitoring (Heather McNairn, NRCan) [** by Ake]
- Sea Ice (Malin Johansson, Univ. Tromsø)

TA1 Observation Requirements

TA1 theme	SAR band	Main Polarisation(s)	QP/CP	Spatial res	Temporal res	Coverage (gap free!!!)	Latency	Relevant Missions	Others
Forest (AGB)	L (C, P)	HH+VV (ideally QP)	Yes	10-25m	~ Monthly	Global	Not critical	NISAR, ALOS-4, BIOMASS, SAOCOM	Gap-free time-series & Open access data policies for public missions!!
Forest (Deforestation)	L	HH+HV	No	10-25m	< Weekly	Regional	1 day (?)	NISAR, ALOS-4	
Wetlands (Inundation)	L (C, S)	HH+HV	No	10-25m	Weekly	Regional/global	Not critical	NISAR, ALOS-4, Sentinel-1, R2/RCM	
Wetlands (Peatlands)	L (C, S)	QP	YES!!!	10-25m	Weekly	Regional/global	Not critical	ALOS-4, SAOCOM	
Agriculture (Crop monitoring)	L, C, S, X	Multi f / multi-pol	YES (CP)	5-10m	~ 3 days	Local/regional	1 day (?)	ALL + X-band	
Agriculture (Irrigated rice)	C, L	HH+HV	Yes	5-10m	~ 3 days	Local/regional	1 day (?)	NISAR, ALOS-4, Sentinel-1	
Soil Moisture	L (C, X)	QP	YES!!!	5-10m	< 3 days	Local/regional	1 day (?)	SAOCOM, ALOS-4 (NISAR, ROSE-L)	
Sea Ice + icebergs	L + C (X)	HH+VV (ideally QP)	QP	5-25m	Daily	Regional	Near-Real Time	Sentinel-1, ALOS-4, RADARSAT, NISAR	

https://docs.google.com/document/d/1fESJZ7OZ0zIsKH_zqrZASjsugWWIY9AJvyBBU_EgT_g/edit?tab=t.0

Main recommendations from ICGS – SAR survey 2022 (1/2)

- **Enhanced Observation Plans for existing and future SAR missions**

  Sub-daily and daily acquisition capabilities, availability of continuous observations (similar to that of the Sentinel series for C-band SAR)

- **Systematic Monitoring Frameworks**

  Establishment of systematic and effective monitoring frameworks that include various sensor types (optical, IR, and multifrequency radar) for real-time data acquisition and analysis.

- **Collaboration and common investment of countries/Agencies**

  in fully-polarimetric, low-frequency, and multi-frequency missions.

- **Increased Access to Multi-Frequency Data**

  Consistent satellite coverages at multiple frequencies and provision of open access to the data as well as to the operational cloud environment for data processing

Main recommendations from ICGS – SAR survey 2022 (2/2)

- **Use of Advanced Technologies**

  integration of AI and advanced onboard processing for satellites

- **Development of Innovative Missions**

  Development of missions focusing on a **multi-frequency tomographic approach or dual-frequency combinations** (like L-band with C-band)

- **Open Data Access**

  Sharing data openly critical to drive research and innovation.