



Committee on Earth Observation Satellites

# WildFire Pilot

Joshua Johnston, NRCan

Helena van Mierlo, CSA

Peter Moore, UN FAO

Doug Morton, NASA

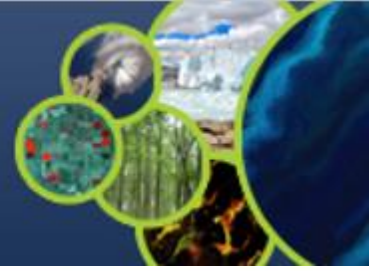
Mark de Jong, NRCan

Jennifer Zhu, CSA

CEOS WG Disasters Meeting #16

September 21, 2021

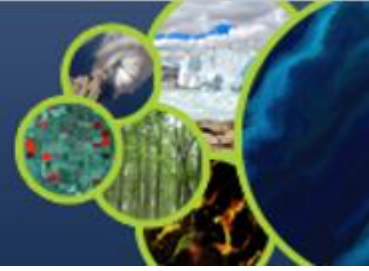




Aim: to provide a comprehensive gap analysis for active-fire earth observation

## Four specific Objectives:

1. Conduct a detailed inventory and gap analysis of existing and proposed EO systems suitable for global active-fire monitoring;
  - *Considering climate change driven fire regime changes and projected mission life spans*
2. Conduct a detailed analysis of global stakeholders and end-users of near-real-time active-fire EO data;
3. Define targeted user requirements for active-fire remote sensing systems for the disaster mitigation applications;
4. Propose a way forward in coordinating global wildfire monitoring activities.



Phase 1

O1:  
EO inventory/Gap Analysis

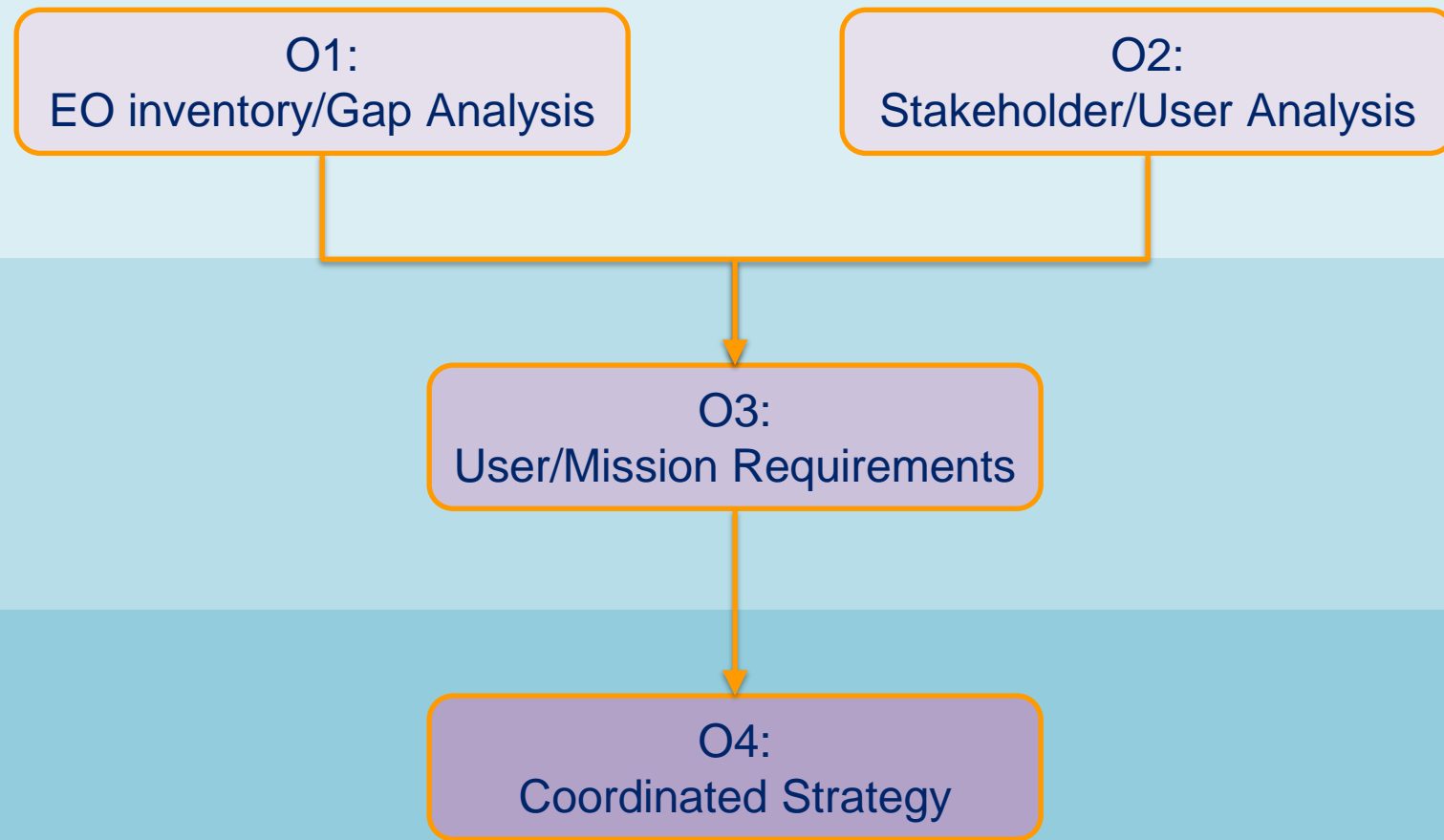
O2:  
Stakeholder/User Analysis

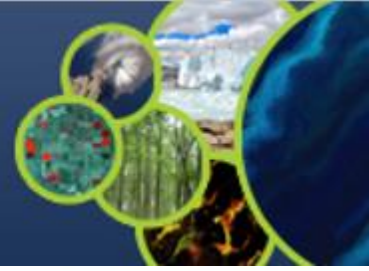
Phase 2

O3:  
User/Mission Requirements

Phase 3

O4:  
Coordinated Strategy





Phase 1

O1:  
EO inventory/Gap Analysis

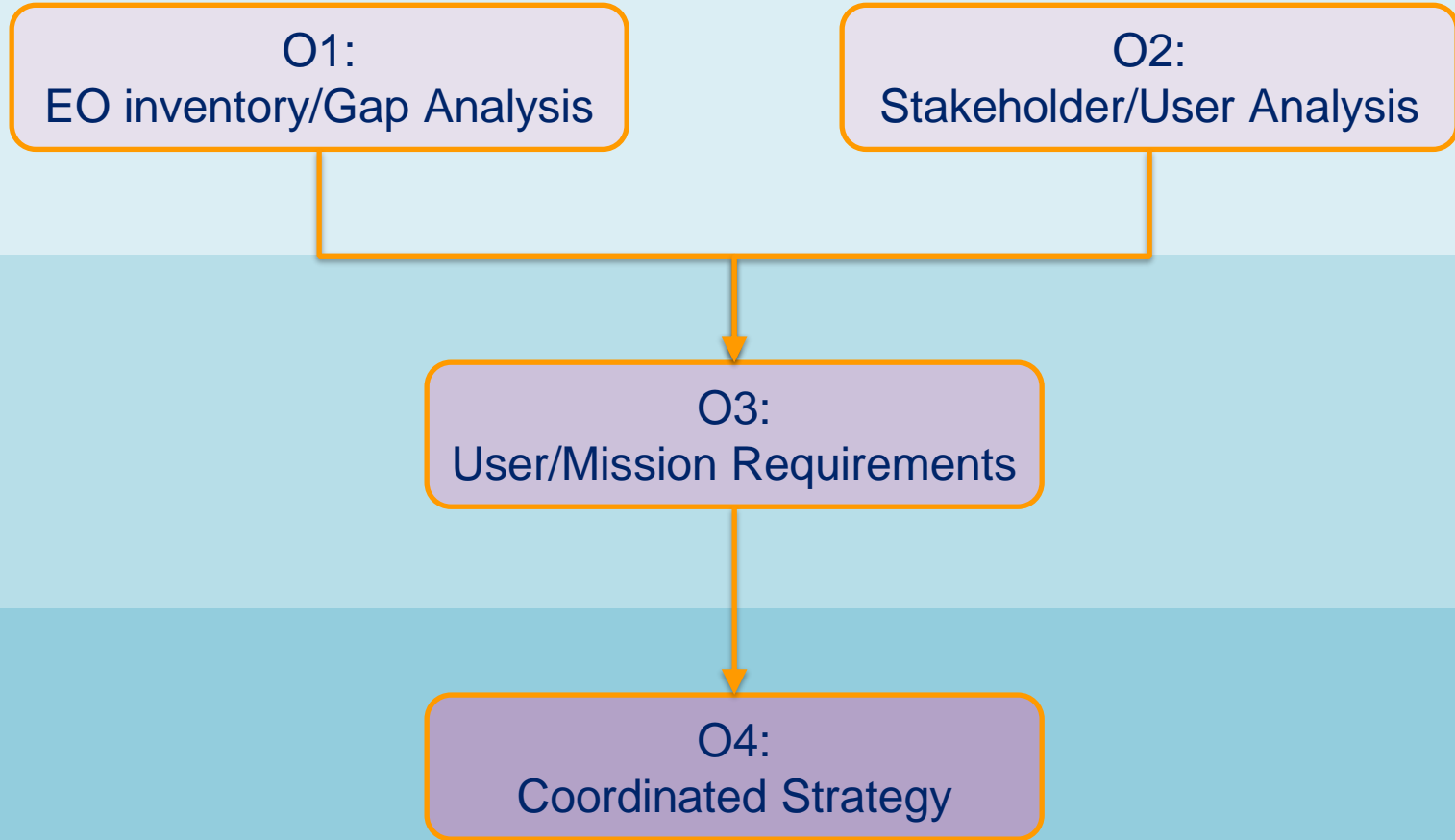
O2:  
Stakeholder/User Analysis

Phase 2

O3:  
User/Mission Requirements

Phase 3

O4:  
Coordinated Strategy





# Status

## Overall:

- 2021 fire season was extreme for many regions
- Many lessons learned and instructive moments
- Many distractions for the Pilot membership

## External Meetings:

- May 28<sup>th</sup>, 2021: Stakeholder meeting
- June 3<sup>rd</sup>, 2021: CEOS WG Disasters Telecon #29
- July 20<sup>th</sup>, 2021: Stakeholder meeting

## Staffing:

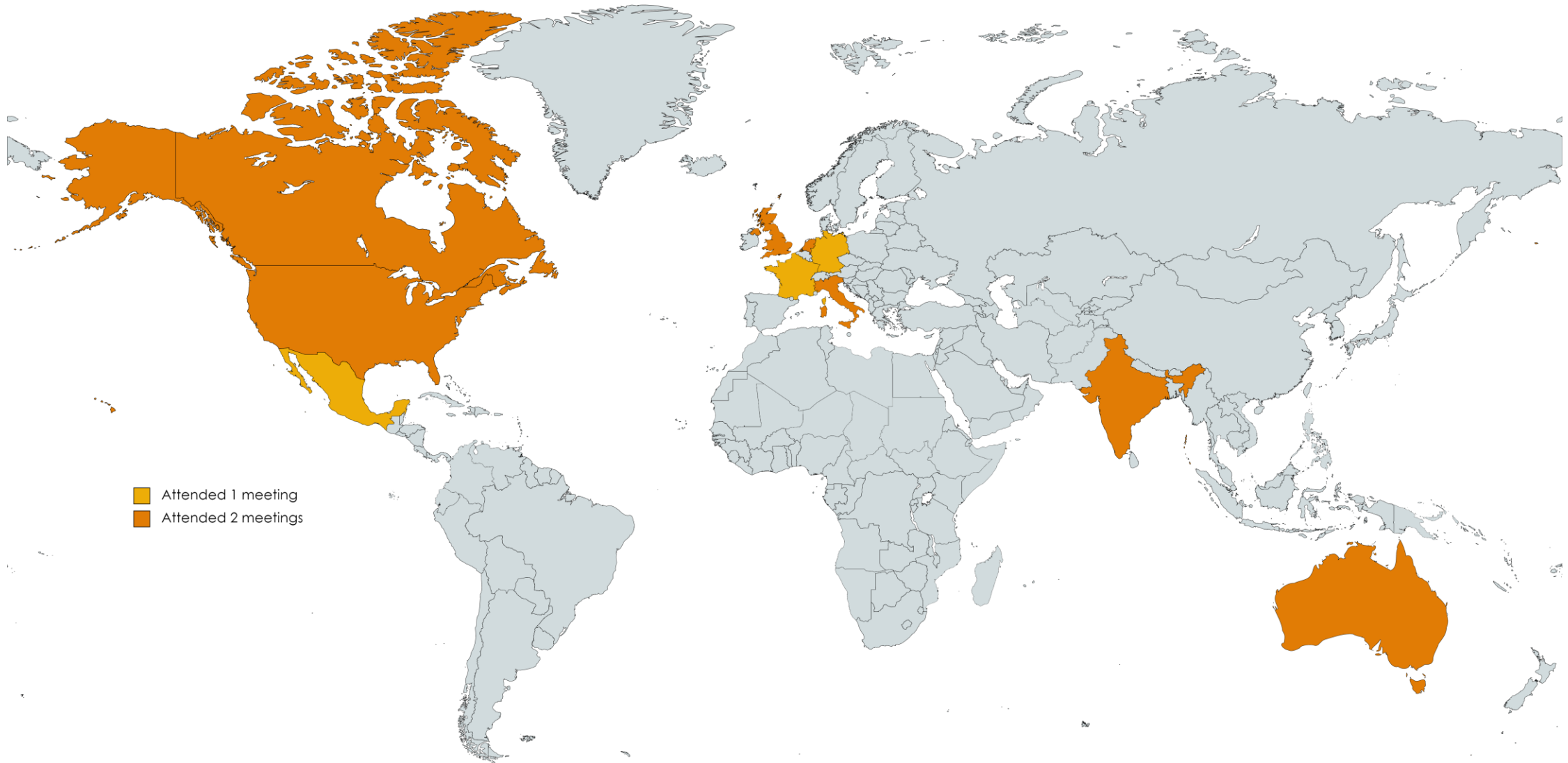
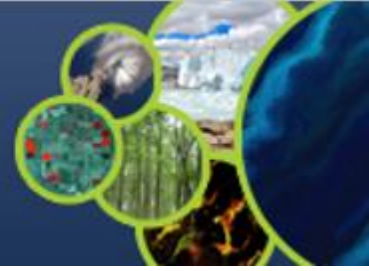
- September 1<sup>st</sup>, 2021: Mark de Jong joins CFS to lead O1

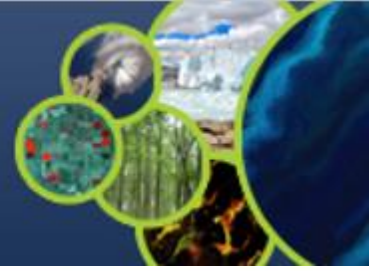
## Pilot Objectives:

- This presentation will highlight progress related to O1 and O2

CEOS WGDIsasters Wildfire Pilot Membership					
Last Updated: 28AUG 2021 (Total Members: 58)					
First Name	Last Name	Organization	Country	20-May-21	20-Jul-21
Reece	Biddiscombe	ASA	Australia		
Alex	Held	CSIRO	Australia		
Agnes	Lane	AU BOM	Australia		
Norman	Muller	GA	Australia		
Amy	Parker	CSIRO	Australia		X
Stuart	Phinn	EOA	Australia		X
Marta	Yebra	Australian National University	Australia		X
Glenn	Newnham	CSIRO	Australia	X	X
Dan	Johnston	NRCAN	Canada	X	
Joshua	Johnston	NRCAN	Canada	X	
Helena	van Mierlo	CSA	Canada	X	X
Mark	de Jong	NRCAN	Canada	X	X
Didier	Davignon	NRCAN	Canada		X
Daniel	Thompson	CFS	Canada	X	
Alan	Cantin	NRCAN	Canada	X	
Weiyuan	Yao	Chinese Academy of Sciences (CAS)	China		
Pierric	Ferrier	CNES	France		X
Dorella	Papadopoulou	ARGANS (ESA)	France		
Theodora	Papadopoulou	ARGANS (ESA)	France		
Christian	Fischer	DLR	Germany		X
Sebastian	Kleim	DLR	Germany		
Haris	Kontoes	National Observatory Athens (NOA)	Greece		
Stella	Girtsou	Nathional Observatory of Athens	Greece		
Bimal	Bhattacharya	ISRO	India		
GS	Rao	ISRO	India		
Arijit	Roy	ISRO	India	X	X
Peter	Moore	Forestry Officer, FAO	Italy	X	X
Stefania	Amici	INGV	Italy	X	X
Antonio	Montuori	ASI	Italy		
Simone	Lloyd	UN GGIM WG-Disasters	Jamaica		
Adrian	Guzman Gonzalez	AEM	Mexico		X
Adrian	Guzman	Mexican Space Agency	Mexico		
Edwin	Kok	The Netherlands Fire Service / Institute	Netherlands	X	X
Andrey	Kuklin	Roscosmos	Russia		
David	Hodgson	Ordinal Survey	United Kingdom	X	X
Martin	Wooster	King's College London	United Kingdom		
David	Borges	NASA	United States	X	X
Doug	Morton	NASA	United States	X	X
Vince	Ambrosia	NASA	United States		X
Allison	Craddock	NASA JPL	United States		X
Ivan	Csiszar	NOAA	United States	X	X
Louis	Giglio	UMD	United States		
Everett	Hinkley	USDA	United States	X	
Mike	Pavolanis	NOAA	United States	X	X
Ellen	Ramirez	NOAA	United States		
Wilfrid	Schroeder	NOAA	United States		X
Jean Paul	Vernier	NASA	United States		X
Robert	Ziehl	UAF	United States	X	
Alison	York	Alaska Fire Science Consortium	United States	X	
Jennifer	Jenkins	BLM Alaska	United States		
Jennifer	Delamere	Geographic Information Network of A	United States		
Diane	Davies	NASA	United States		X
Olivier	Arino	ESA			
Phillippe	Bally	ESA			
David	Roy		United States		X
Jesus	San-Miguel			X	
Ken	Holmlund	WMO			
James	MacCarthy	WRI			
Fred	Stolle	WRI			X





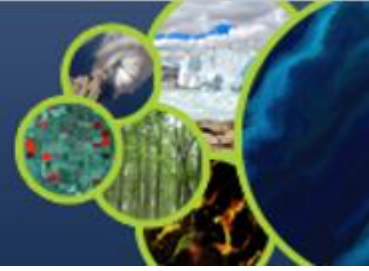


## Objective 1:

- a) Assemble datasets to form a spatial and temporal global fire regime dataset with climate change projections on 5 year intervals (2020-2050)
- b) Identify existing and future active fire EO capabilities and coverage areas
- c) Map existing EO coverage and future projections on 5 year intervals
- d) Develop metrics for analyzing fire regime and EO capability change correlations

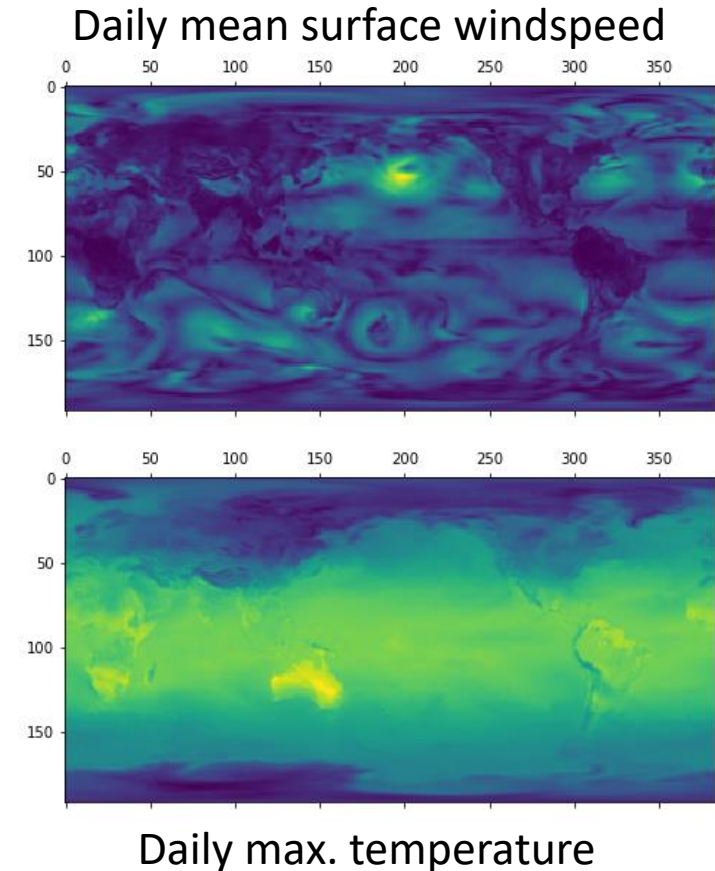
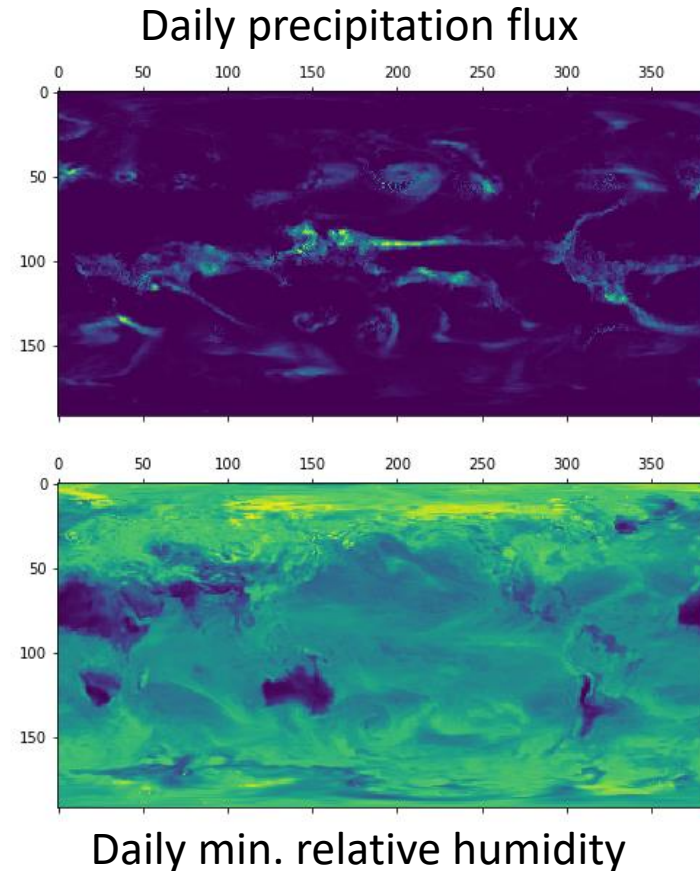
## Objective 2:

- a) Outreach to regional networks and partners to identify stakeholders and end-user communities
- b) Engage end-users (directly or through regional partners) to identify:
  - Agency responsibilities, priorities and perceive challenges in the future
  - User sophistication level (i.e. level of training, agency capacity/policy)
  - Current level of use and use cases



(Objective 1-a) “Assemble datasets to form a spatial and temporal global fire regime dataset with climate change projections on 5 year intervals (2020-2050)”

- Currently developing fire weather climate change predictions based on delta change methodology;
- Methodology is exploring a number of model options;
  - e.g. CMIP6 (as seen here);
- A sub-project team has been established to address this task.







## (Objective 1-b) “Identify existing and future active fire EO capabilities and coverage areas”

- Catalogue of existing active-fire capable systems is being assembled;
- Scoring criteria for system coverage is under development;
  - Factors such as: spatial/temporal resolutions, FRP measurement capability, etc;
- Coverage density/quality modelling to be conducted via STK;

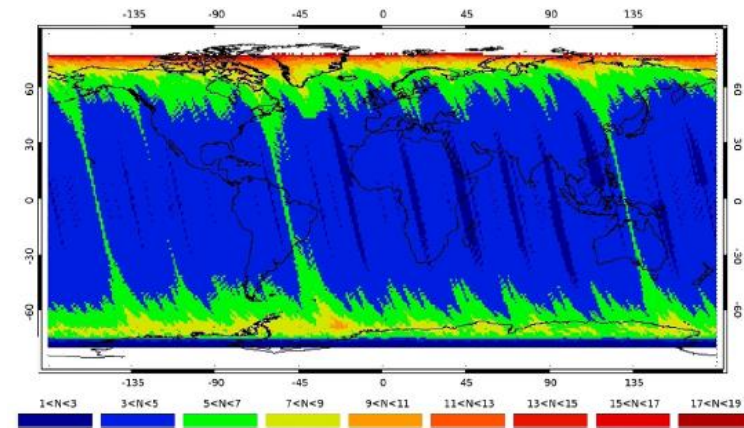


Fig. 2. Global maps of monthly ATSR-2 overpasses. Upper panel: March 2001; lower panel February 2002.

Fig 1. No of monthly ATSR-2 satellite overpasses (Arino et al. 2011)

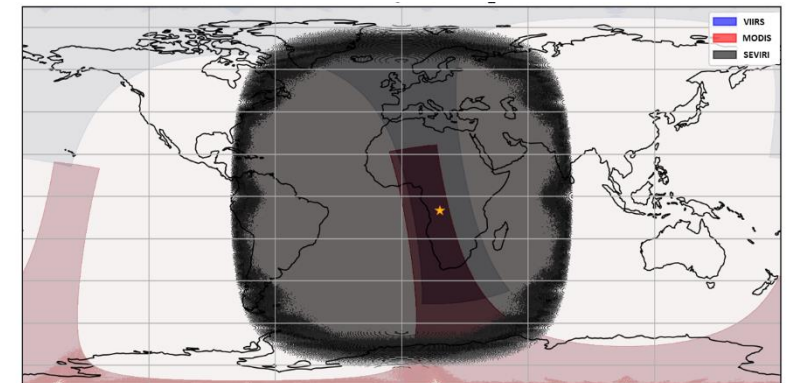
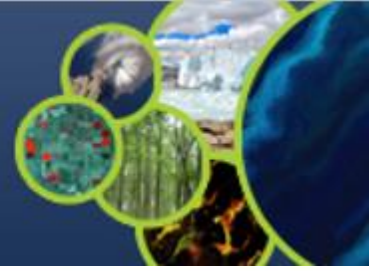


Fig 2. Example spatial footprints of VIIRS, MODIS & SEVIRI (Wooster et al. in review)

# Objective 2 – Key Elements

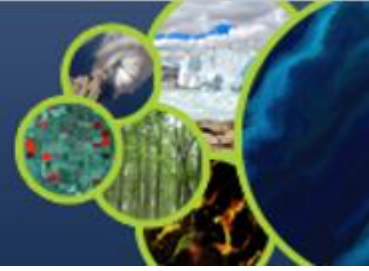


**Objective 2: Conduct a detailed analysis of global stakeholders and end-users of near-real-time active-fire EO data**

## WORK PLAN 2021-2022

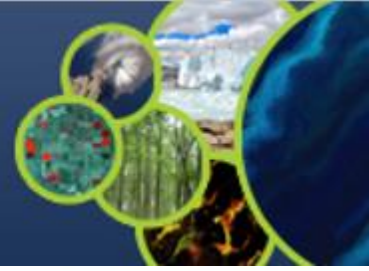


ACTIVITIES	SEP 2021	JAN 2022	APR 2022	JUL 2022
End-user engagement initiated (directly or through regional partners) to identify stakeholders and end-user communities	██████████			
Develop survey method and questionnaire	██████████			
Create and apply a user characterization to stratify stakeholders, including nations, and focus the method(s) as appropriate	██████████			
Seek input from representative/ interested countries to assess existing capacity		██████████		
Analyse survey and refine method for focused consultations, including a more regionally specialized approach where necessary		██████████		
Outreach to users through GOFC-GOLD, FAO, Stakeholder Group, other networks and any suggestions by CEOS WGD for consultation			██████████	██████████
Stakeholder classification				██████████
End-user classification				██████████



(Objective 2) “Conduct a detailed analysis of global stakeholders and end-users of near-real-time active-fire EO data”

- Preliminary fire management stakeholder mapping:
  - **Europe** - EU project PyroLife; Expert Group on Forest Fires (EGFF) convened by the European Commission
  - **North America** - Fire Managers involved in the Canadian fires this current season (US/Europe also?)
  - **Latin America and the Caribbean** - Expert Group of Latin America and Caribbean Region supported by the EU; Red Latinoamericana de Teledetección e Incendios Forestales;
  - **Asia Pacific** - EMSINA the Australian Emergency Management Spatial Information Network;
  - Global - FAO country projects may include Sudan, Algeria, Morocco, Lebanon, Jordan, Cambodia, Myanmar, Timor Leste, Indonesia; World Resources Institute users, Ministries of forestry, NGOs, Companies; FlameWork–Mafra, an informal fire management user group
  - **South Asia?** – initial contact with India
  - **Africa?** – SAFNET
- Any linkages, ideas or suggestions from CEOS WGD would be welcome!



- Outreach to CEOS membership to begin targeting up coming active fire systems to be considered in the next stage of O1-b/c;
- Continue building consultation group; develop survey and seek input from representative/interested countries to assess existing capacity
  - Advice on country and stakeholder contacts from CEOS WGD very welcome
- For new people that would like to join, please contact [Jennifer.zhu@Canada.ca](mailto:Jennifer.zhu@Canada.ca)