



Committee on Earth Observation Satellites

WildFire Pilot

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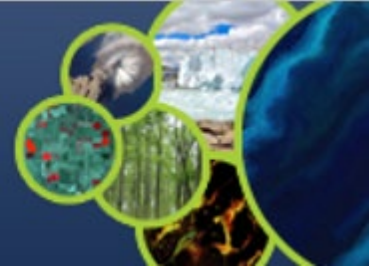
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CEOS WG Disasters Meeting #17

March 15, 2022

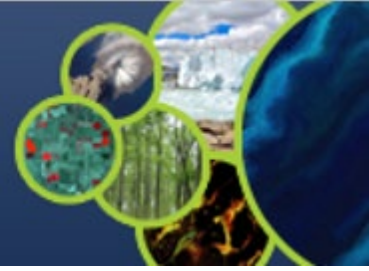




Aim: to provide a comprehensive gap analysis for active-fire earth observation

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

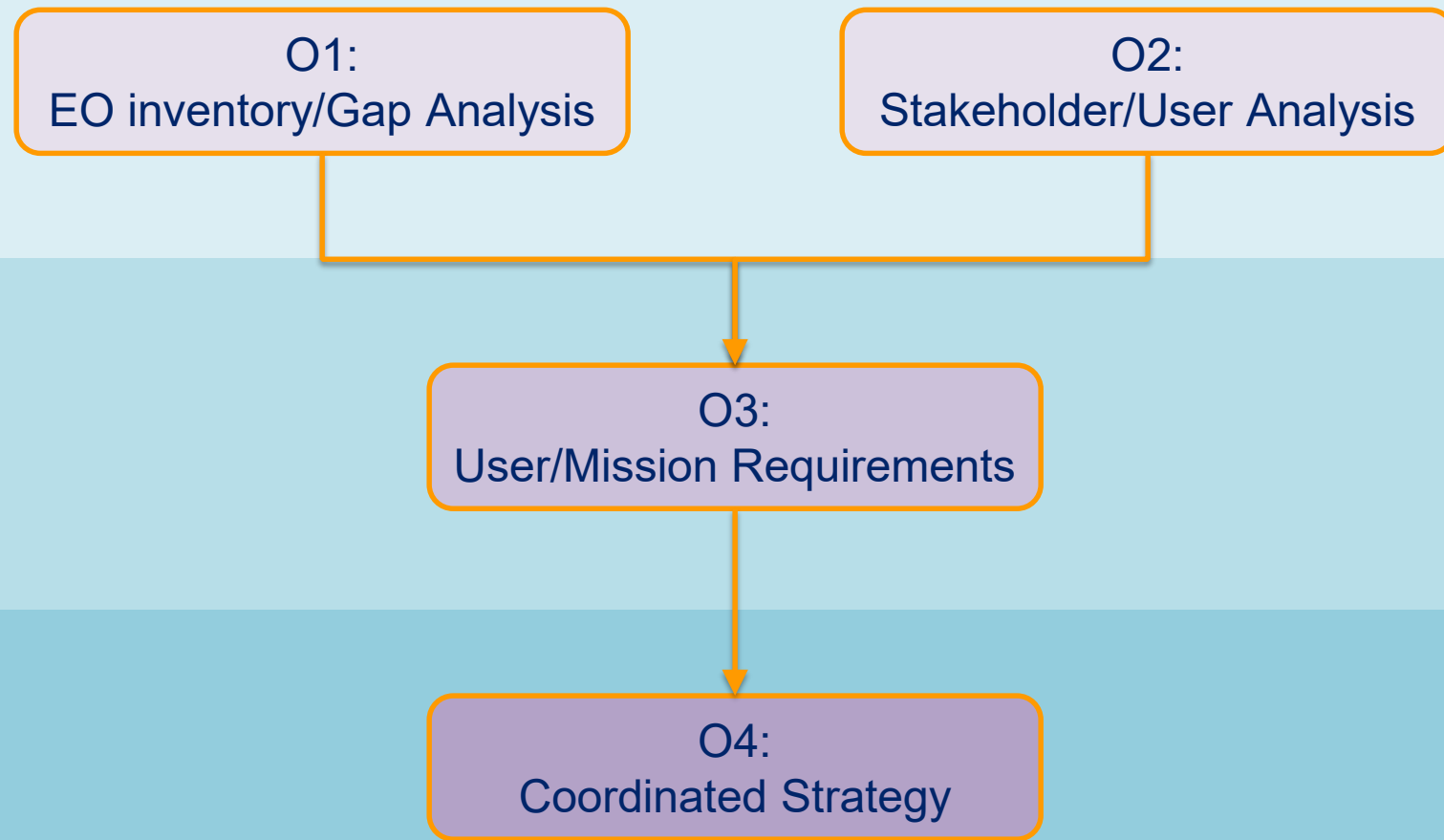
O2:
Stakeholder/User Analysis

Phase 2

O3:
User/Mission Requirements

Phase 3

O4:
Coordinated Strategy



Objective 1 – Key Elements

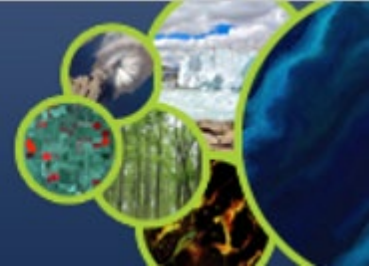


Objective 1: Conduct a detailed inventory and gap analysis of existing and proposed EO systems suitable for global active-fire monitoring

WORK PLAN 2022

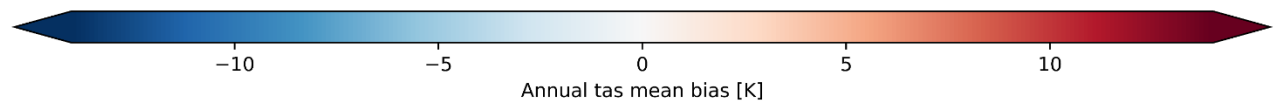
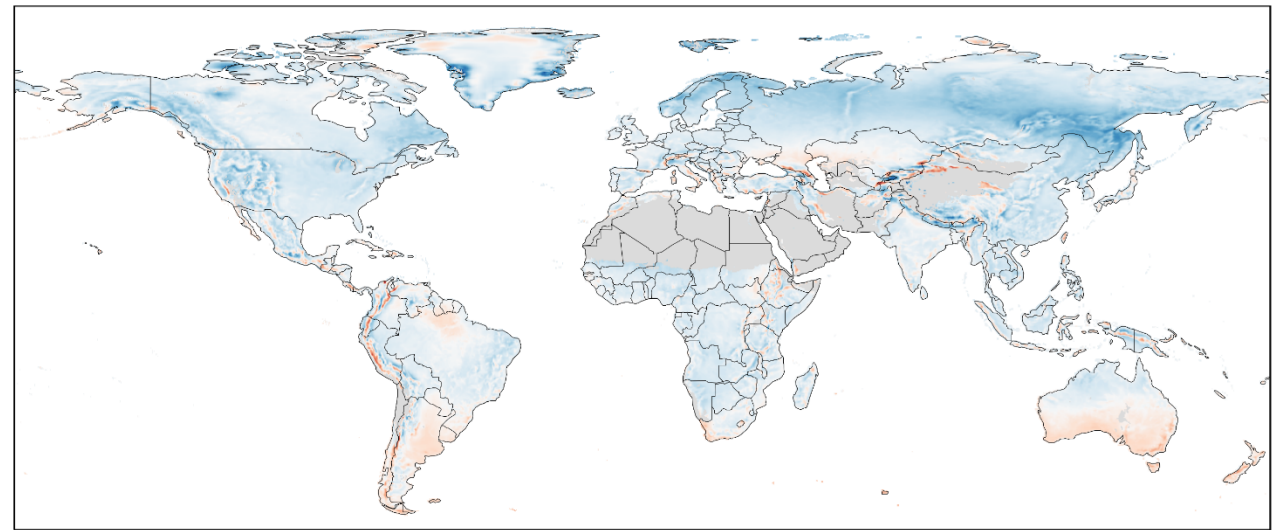


| ACTIVITIES | Q1 | Q2 | Q3 | Q4 |
|--|----|----|----|----|
| Objective 1a: Assemble datasets to form a spatial and temporal global fire regime dataset | | | | |
| <i>Develop workflow for generating future fire weather datasets from CMIP6 GCM outputs</i> | | | | |
| <i>Generate full fire weather ensemble & map fire regime change indicator metrics</i> | | | | |
| Objective 1b: Identify existing and future active fire EO capabilities and coverage areas | | | | |
| <i>Compile commercial system capabilities</i> | | | | |
| <i>Expert review of CEOS database analysis</i> | | | | |
| Objective 1c: Map existing EO coverage and future projections on 5 year intervals | | | | |
| Objective 1d: Develop metrics for analyzing fire regime and EO capability change | | | | |



(Objective 1-a) “Assemble datasets to form a spatial and temporal global fire regime dataset with climate change projections over the 2020-50 period”

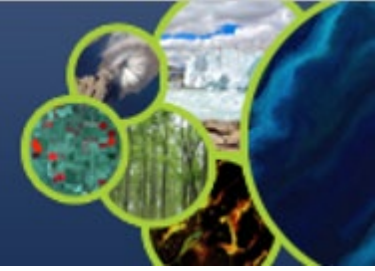
- Ensemble of future fire weather, based on CMIP6 GCMs, will be used as the indicator of future fire regime changes;
- Characterizing GCM biases (vs. ERA5 reanalysis) in the meteorological inputs to fire weather for historical baseline period (1985-2014);
- Biases in the fire season are most important;
- Evaluate current and planned EO fire data availability compared to future ‘meteorological fire seasons’ using GCMs with lowest bias compared to fire season reanalysis data



Annual mean bias in 2m air temperature from the EC-Earth3 GCM (vs. ERA-5 reanalysis), 1985-2014



Objective 1-b



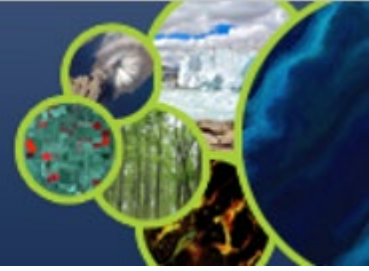
(Objective 1-b) “Identify existing and future active fire EO capabilities and coverage areas”

- Catalogue of active-fire detection capable systems assembled;
- CEOS MIM database analysis complete: many more current & future satellites than expected are potentially capable of NRT fire monitoring (see figure);
- Non-US/EU capabilities (esp. China, Russia, India) look impressive, but little information publicly available / in our user community. Are/will fire products (or underlying data) from these missions ever become widely available?
- Currently refining this list to filter viable missions;
- Commercial mission capabilities also being explored, but very limited information available;



Timeline of current (post 2015) and planned sun-synch LEO satellites potentially capable of nrt monitoring of fire using SWIR to TIR data, from the CEOS MIM database. Satellites (or their predecessors) with existing nrt products

Objective 2 – Key Elements

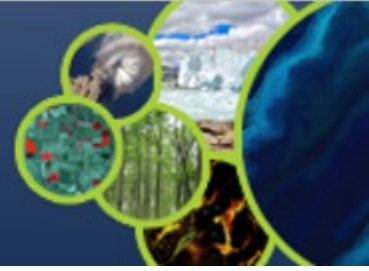


Objective 2: Conduct a detailed analysis of global stakeholders and end-users of near-real-time active-fire EO data

WORK PLAN 2021-2022

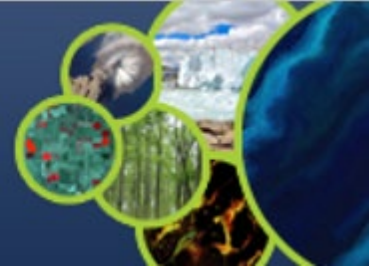


| ACTIVITIES | SEP 2021 | JAN 2022 | APR 2022 | JUL 2022 |
|--|------------|------------|------------|------------|
| End-user engagement initiated (directly or through regional partners) to identify stakeholders and end-user communities | ██████████ | | | |
| Develop survey method and questionnaire | ██████████ | | | |
| 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”

- Fire management stakeholder mapping has been undertaken and is ongoing.
 - Any linkages, ideas or suggestions from CEOS WGD would be welcome at any time
- Method – the consultation will use focus groups and key informants to access in-depth information on the attitudes and behaviours of informants.
 - An Aide Memoire of guiding questions has been prepared.
- Scheduling for consultations in preparation.



Objective 1:

- Systematically refine the list of EO satellites from CEOS MIM database, and gap fill parameters needed for orbit planning;
- Complete GCM historic bias evaluation, and derive fire weather for future scenarios;

Objective 2:

- User Characterisation - Initial development of a set of attributes and characteristics for users to self assess against is under way. The intention is to be able to understand what exists, is needed and the links that may be created or strengthened in relation to EO.
- Conduct interviews commencing in Q1 2022 and into Q2 2022