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Copernicus 2 and the C3S2_311 Lot3 contract: Collection and Processing of In Situ Observations

Kick-off meeting 13/12/2021

Hans Hersbach, C3S ECMWF

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The Copernicus Climate Change Service

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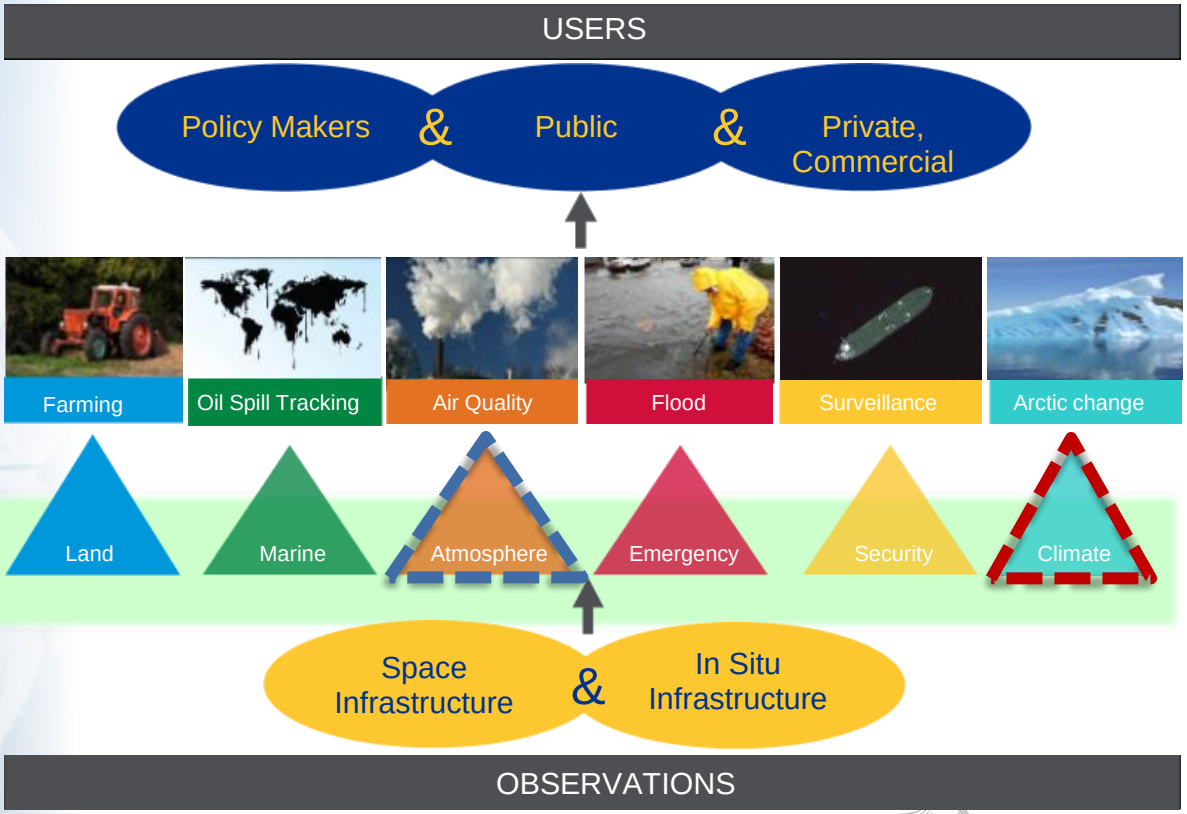

Different Needs

Examples of areas covered

6 Information Services

Sustainable observation capabilities

ECMWF operates the Copernicus Climate Change Service (C3S) and Copernicus Atmosphere Monitoring Service (CAMS) on behalf of the European Commission.

C3S in Copernicus 2

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7 year program: Q3 2021 – Q2 2028

(C3S2_311 Lot 3: Q4 2021 – Q4 2025)

Enhanced continuation and service evolution in four pillars:

- C3S Climate Data Store (synergies with CAMS)
  - Sustained networks of in-situ and satellite-based observations (ECV's)
  - Climate reanalysis
  - Multi-system seasonal to interannual forecasts
  - Climate projections under various emission scenarios
- Sectorial Information System (SIS)
  - Provision of sector-specific information products, including tools, applications and benchmarking, to support European policies or national climate service providers.
- Evaluation and Quality Control (EQC)
  - assuring the delivery of authoritative and vetted climate information.
  - records user requirements in a URDB
- Communication, climate-intelligence for Users, Training & Engagement (CUTE)

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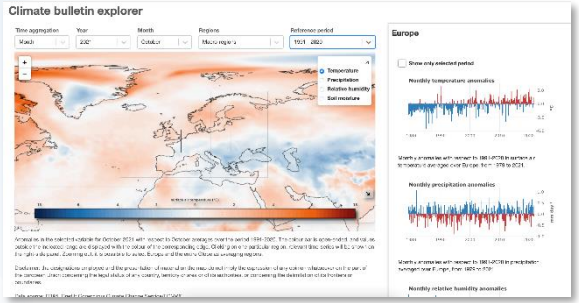
Climate Intelligence activities



Climate Bulletin explorer application

- updated to include further interactivity and exploration of e.g., reference periods

WMO Preliminary statement for 2021

-contributing information + data; temperature, sea level, etc..

ESOTC2021

- tentative schedule for release: April 2022
- ongoing evolution for ESTOC based on stakeholder and user input

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Communication

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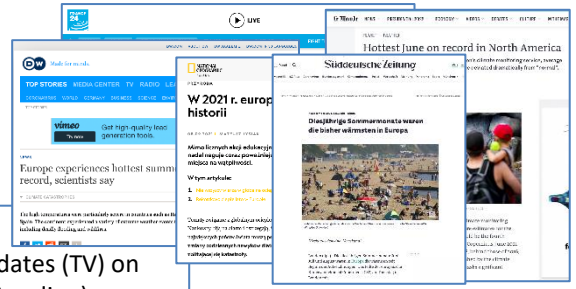
Media coverage for C3S in Q3 2021

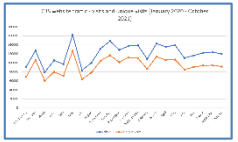
- C3S received 2473 media mentions in Q3 across xx countries.
- 1025 media mentions were for the climate bulletin's July temperature analysis, which performed strongly.
- Along with CAMS, the combined media coverage in Q3 was the highest for the 12-month period with 4656 mentions vs 4508 Q2 20.



Media partnerships

The media partnerships with CNN and Euronews continue to perform well, consisting of climate updates (TV) on CNN where C3S data and maps are used, and more substantial sponsored Climate Now shows (TV & online), Youtube Lives and written articles on Euronews (all with speakers and/or content from C3S).

- Impacts for the Euronews Climate Now TV broadcasts were estimated to be **33.7 million** reaching 13% of the Euronews audience.
- For the **online** content, in total there have been **1,929,022 page views** since July 2019 across the articles, Climate Now video pages and Climate Now Hub visits; 174,785 page views during the last quarter.
- The Youtube Live – part of C3S communication activity trailing the lead up to COP26 was on How can we build our resilience to weather extremes?' and received 146,046 views in Q3. Panellists included IPCC co-chair Valerie Masson Demotte and Samantha Burgess, C3S Deputy Director;



Social Media :

- C3S social media channels all increased their follower numbers and impressions in Q3.
- The ECMWF Copernicus **twitter** account, shared with CAMS, finished the first Quarter with **over 40,000** followers (up by 3k) and at the time of writing in early November it is 41.6k
- The highest performing content was for July's temperature analysis issued in August. The **tweet received 10.8k engagements and over 1.3million impressions**.
- *Traffic to the **C3S website** continued to do well with **total visitor numbers of 178.8k** and **total page views of 362.8k***

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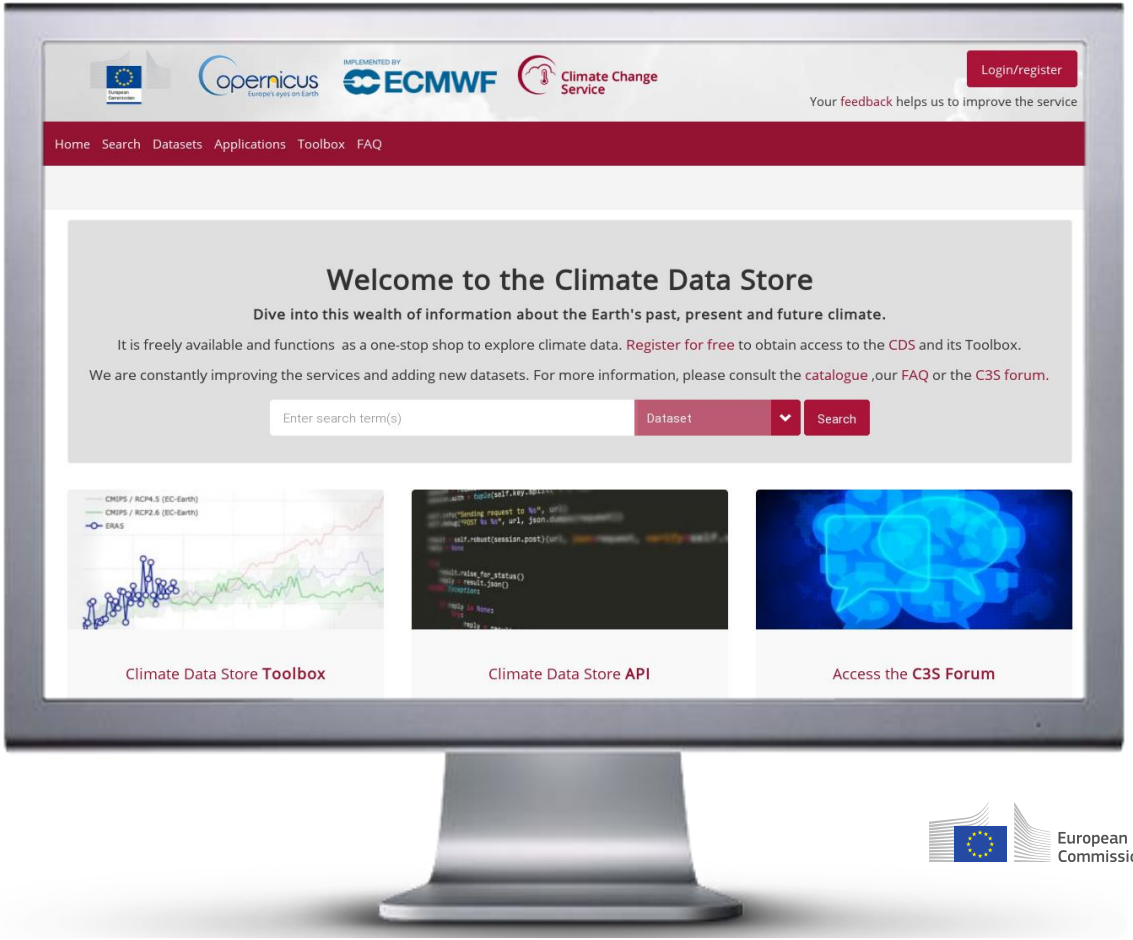
The Climate Data Store is the central entry point for C3S datasets



- ✓ Unified and free access to a large portfolio of climate data
- ✓ Direct downloading
- ✓ Cloud computing: CDS Toolbox
- ✓ Quality assurance reports
- ✓ User Support

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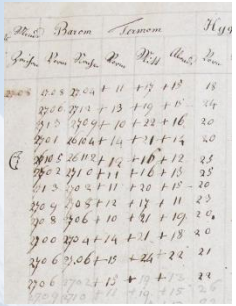
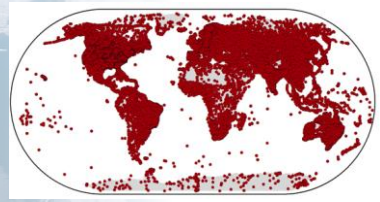
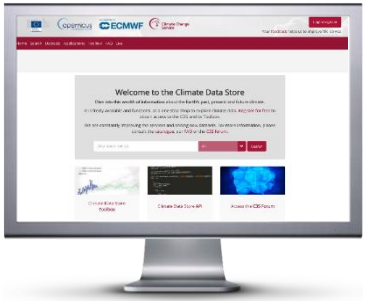
Collection and processing of in situ observations







Historical in situ observations play an important role in C3S, e.g.:

- for accurate climate monitoring,
- as input to global and regional reanalyses,
- as 'ground truth' for cal/val of ECV products.

C3S focuses on:

- the facilitation of data rescue activities,
- the improvement of historical records,
- collection into well-maintained archives,
- to provide access via the C3S Climate Data Store.

Some challenges:

- data rescue and improvement is an enormous task,
- urgency due to degradation of original records,
- non-gridded, irregular in space and time,
- a wide range of user requirements,
- a wide range of data licenses.

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Evolution of the C3S in-situ contracts: from 5 to 3

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P. W. Thorne et al.: Making sense of environmental measurement networks

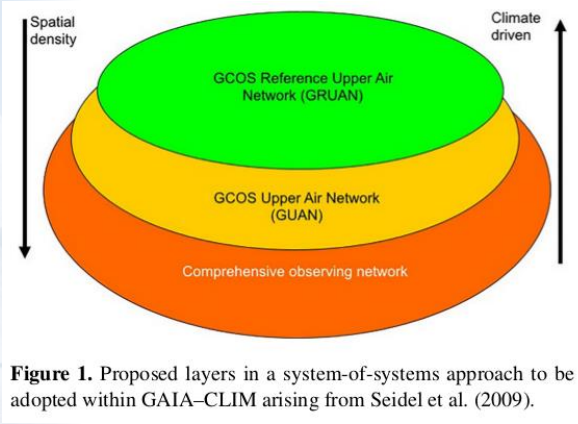

Figure 1. Proposed layers in a system-of-systems approach to be adopted within GAIA–CLIM arising from Seidel et al. (2009).

Data rescue activities:

- coordination, inventories, registry, support
- some rescue activity
- **4) 311a Lot 1**

In COP2 we'll go from 5 to 3 contracts:

- **C3S2_311 Lot 1: C3S_311a Lot 1 + 2**
- **C3S2_311 Lot 2: C3S_311a Lot 3 + 311c Lot 2**
- **C3S2_311 Lot 3: C3S_311a Lot 4**

Three tiers of observing networks:

- **Reference**
  - metrologically traceable observations, with quantified uncertainty
  - **1) 311a Lot 3**
- **Baseline**
  - long-term records, lack the absolute traceability
  - **311a Lot 3**
- **Comprehensive**
  - the rest
  - **2) 311a Lot 2**: surface land/marine
  - **3) 311c Lot 2**: upper air

Gridded ECVs and Indices for Europe:

- underlying observations are typically restricted
- ECA&D from EUMETNET and other sources
- **5) 311a Lot 4**: E-OBS

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The C3S2_311 Lot 3 contract: WP1 and WP2

WP1: Collection of input observations

- As part of the ECA&D activities
- Additional sources
- Assist ECMWF in acquiring of non-GTS data sets

WP2: Gridding of observations and provision of uncertainty estimate

- Selection of observations
- Homogenization
- Aggregation
- 2m temperature (minimum, average, maximum), amount of accumulated total precipitation, average mean sea level pressure, average surface downwelling shortwave radiation, average 2m relative humidity and average 10m wind speed
- At least 20 ensemble members per quantity to represent uncertainties
- Timely updates, version updates

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The C3S2_311 Lot 3 contract: WP3 and WP4

- **WP3: Publication of datasets in the CDS**
  - Maintain provision of E-OBS, NGCD, LAPrec
  - In addition to ensemble mean+spread, all 20 ensemble members
  - Up-to-date and comprehensive documentation
  - Provision of climate indices
    - Toolbox application
    - Users should be able to re-calculate these from the info in the CDS ensemble members

- **WP4: Outreach (CUTE) and improvement of data policies**
  - More integrated/unified with information from other parts of the C3S service
  - Support the C3S climate intelligence team
  - Support the C3S communication Team on relevant activities
  - Lobby in favor of licences to be aligned with the open&free Copernicus licence

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Concluding remarks

- It is good to see the start of this new contract on the continuation and enhancement of activities
- Purpose of this kick-off meeting is to fine-tune the interactions between all contributors
- Some evolution in the team at ECMWF:
  - Paul Berrisford will take over the TO role from Cornel Soci
  - Francesca Guglielmo will be POC for interactions with the C3S climate intelligence team
  - C3S is in the process of hiring a dedicated C3S in-situ manager