



**Realise the full potential of the long-term global EO archives that ESA, together with its Member states, has established over the last thirty years ...**

**... as a significant and timely contribution to the ECV databases required by the United Nations Framework Convention on Climate Change**

- **Respond to GCOS Requirements for UNFCCC**
- **Puts European scientists at the forefront of generating Satellite based Climate records.**
- **Strengthen European Research Communities presence in IPCC Assessments**
- **Take benefit of the 30 years investment of ESA Member States in EO Global Observations**

- **Creation of a European EO Climate Science community**
- **Facilitate the scientific cooperation between the Climate Observing and Modelling Communities**
- **Develop a protocol for Climate Quality Algorithms Evaluation in an international context.**
- **Delivered fully Error Characterised Climate Data sets, first for many ECVs**
- **Provided up to date validated scientific data sets to support International Climate Policy and decision making.**

# A European EO Climate Science Community

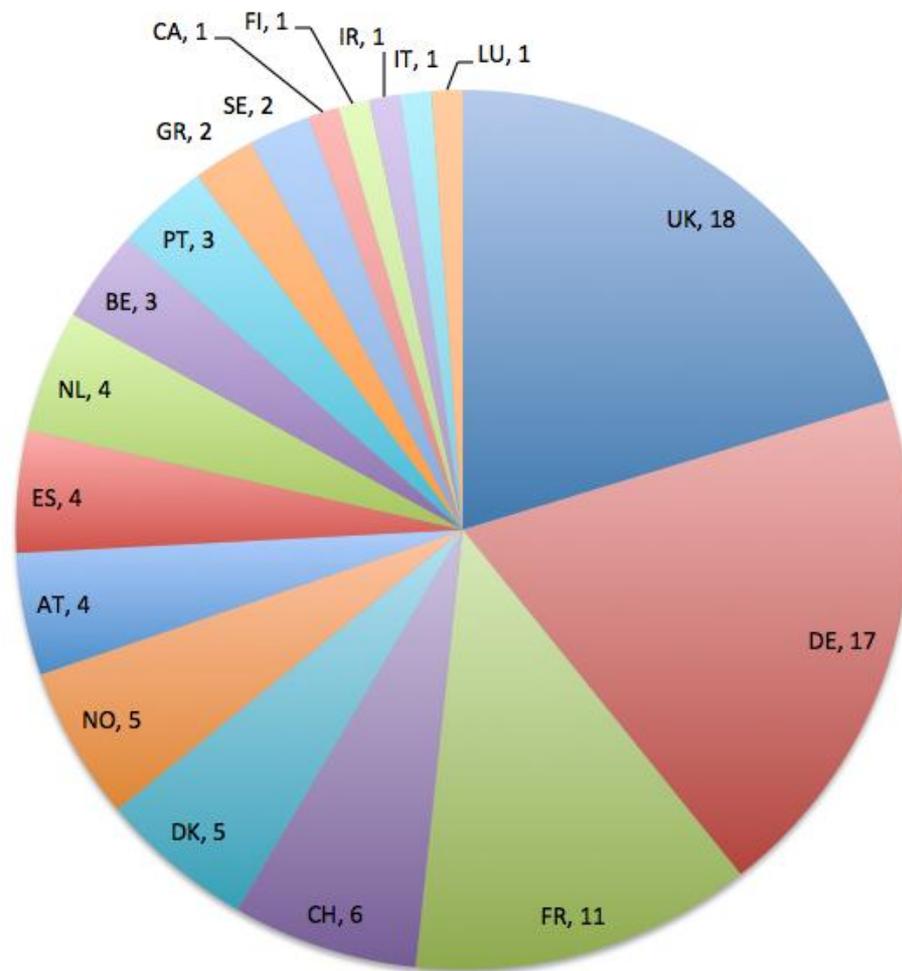


## CCI Science Leaders:

- Anny Cazenave (Sea Level)
- Andy Shepherd (Ice Sheet-Antarctica)
- Chris Merchant (Sea Surface Temperature)
- Emilio Chuvieco (Fire)
- Frank Paul (Glaciers)
- Gerrit Leeuw (Aerosol)
- Leif Toudal Pedersen (Sea Ice)
- Michel van Roozendaal (Ozone)
- Michael Buchwitz (Greenhouse Gases)
- Pierre Defourny (Land Cover)
- René Forsberg (Ice Sheet-Greenland)
- Roger Saunders (Climate Modellers)
- Rainer Hollmann (Cloud)
- Shubha Sathyendranath (Ocean Colour)
- Sophie Bontemps (Land Cover)
- Stein Sandven (Sea Ice)
- Thomas Holzer-Popp (Aerosol)
- Wolfgang Wagner (Soil Moisture)

and many others ...

## Number of Contributing National Entities Total 89



- **Generate peer reviewed publications in high impact scientific journals by European Scientific Community ( >170 publications)**
- **Pave the way for the ECV component of the Copernicus Climate Change Services,**
- **Facilitate the Sea Level Closure Budget by strengthen dialogue between Glaciers, Ice Sheets and Sea Level research communities,**

# Toward a programme extension



- **Maintain European contribution to the CEOS coordinated response to GCOS,**
- **Involve the European Science Community in the development of new ECVs,**
- **Further enhance European Research Communities presence in IPCC Assessments,**
- **Capitalise on new Research Missions to Global Climate Records.**

- **The fifth CCI Collocation meeting took place successfully on 20-22 October 2014 in ESRIIN, Frascati.**
- **The meeting focused on two main questions**
  - 1) What steps are needed to make the CCI ECVs operational?
    - *To aid discussions and enhance working relationships, the main services of Copernicus that are relevant for the CCI projects were invited to the meeting. The Climate, Land, Marine and Atmospheric services gave an overview of their expectations for incorporating ECVs into the services and the structures in place for translating the data into information for users.*
  - 2) What are the key research questions that link multiple ECVs?
    - *To address this question, the science leaders of the projects were given more scope to structure the meeting.*
    - *Consequently a session was dedicated to how the projects deal with and present uncertainties in their data.*
    - *This has emerged as a key research question for the CCI, with some projects organising specific activities on the topic; the results of which will be taken forward in Phase 2 and at the next Collocation meeting.*

- **Other cross-ECV research topics include closing the Sea Level budget, which comprises six of the current CCI projects, plus the new project on Ice\_Sheets\_Antarctica\_cci.**
- **A meeting is being organised by Anny Cazenave (Sea\_Level\_cci) with the other six CCI projects, plus external participants on the topic, to be held at ISSI-Bern, 2-6 February 2015.**
- **Other research topics include the carbon cycle and data-model comparisons, to be led by CMUG.**

- **The Visualisation Tool continues to be developed along two lines:**
  - an 'Exhibition version' and a 'Public version'.
- **Further data sets from *Fire\_cci*, *Aerosol\_cci* and *Sea\_Ice\_cci* have recently been added to the Exhibition version**
- **The Public version is at the design specification stage.**
- **The popularity of the tool with scientists, both those involved in the CCI and those external to the programme, was not originally envisaged so efforts are being made to produce a version that be easily distributed to the project teams and adapted to each ECV.**

- **Proposals for the CCI Data Portal were received in November and are currently under review. The successful proposal is expected to begin in Q1 of 2015.**

- **As part of the ESA Living Planet Fellowship a call was put out for proposals for 2-year funded postdoctoral positions that make use of CCI data, to be held at a host institution.**
  - The applications have now closed and successful candidates have been selected and informed.
  - Nine proposals have been selected, 4 from the UK, 2 from Germany, and 1 each from Finland, Spain and France.
- **The researchers should enhance interactions across the ECVs and between other Earth Science laboratories, research centres and universities.**
- **Due to the success of the call in 2014, a new call will be made in 2015.**

- **The three later-starting ECV teams, *Soil\_Moisture\_cci*, *Sea\_Ice\_cci* and *Ice\_Sheets\_cci* have all successfully delivered their Phase 1 products**
  - all data sets are accessible online, through the project websites.
- **The main achievement of *Sea\_Ice\_cci* in Phase 1 is that their ice concentration product is calculated using the most accurate algorithm, based on a detailed algorithm intercomparison study.**
- **For *Soil\_Moisture\_cci*, the updated 35-year data set is now the best available long-term remotely sensed surface soil moisture data set.**
- ***Ice\_Sheets\_cci* now have European products of better quality.**

- **The *Fire\_cci* project has completed Phase 1, with all necessary documents now submitted and approved and availability of the products ensured, via the *Fire\_cci* website.**
- **The Technical Annex is currently at the draft stage in preparation for issue as a Request for Quotation in Q1 of 2015.**

- **The remaining CCI projects are progressing well and looking closely at how to improve within Phase 2.**
- **For some projects, such as *Cloud\_cci* and *Aerosol\_cci* this involves broadening the scope of the data sets;**
  - *Cloud\_cci* plan to include spherical cloud albedo as an additional experimental product,
  - *Aerosol\_cci* will extend the project to explore information content on aerosol properties.
  - For others such as *Ozone\_cci* and *Ocean\_Colour\_cci* this involves extending the data sets temporally and applying their algorithms to more sensors.

- **For all ECVs there has been more of a focus on cross-ECV interactions, partly due to the fact that the ECV data sets are now more mature.**
- **These interactions have been encouraged by ESA through the Collocation meeting and the post-doctoral fellowships and will be further supported throughout Phase 2 of the programme, as well as the ISSI Sea Level workshop (mentioned before)**

- **ESA has continued its cooperation with international partners, to ensure a coordinated, global response to GCOS that includes a concerted and coherent contribution from European actors (CEOS WGClimate., CEOS SIT Workshop and CEOS Plenary)**
- **ESA participated in the WGClimate European Stake Holder meeting in Geneva at the end of September.**
  - In the context of WGClimate, the work to link each record of the ECV inventory to the GCOS requirements has continued.
  - Once the Inventory records are fully consolidated, the next step will be to perform a gap analysis.
  - A series of case studies have been set to consolidate the Climate Architecture from sensing to decision-making.

- **The CCI had a dedicated session and a stand at the Climate Symposium, held in Darmstadt from 13-17 October.**
  - The session had four talks from the science leaders, covering all the CCI projects in the categories of Atmosphere, Ocean, Land and Cryosphere.
  - It was well attended and helped promote the programme to the wider climate science community.
- **A Climate from Space week will be held on 23-27 March 2015 at WMO HQ in Geneva.**
- **The WGClimate meeting will take place on 25-27 March 2015.**

- **CCI Coordination with CCCS (EC/ECMWF)**
  - ECMWF (privileged interlocutor with EC) organised two workshops with stake holders, data providers, potential users...
  - ECMWF wrote their proposal (October 2014)
    - *ECMWF Council*
    - *Signature with the EC.*
  - ESA interested by ECWWMF's definition of "operational ECVs".

# Copernicus Climate Change Service

## Copernicus Climate Change (C3) service



## Provisional timing

Stage 0 - Proof of Concept

Stage I - Pre-Operational

Stage II - Operational ~20 ECVs, ~5 Sectors

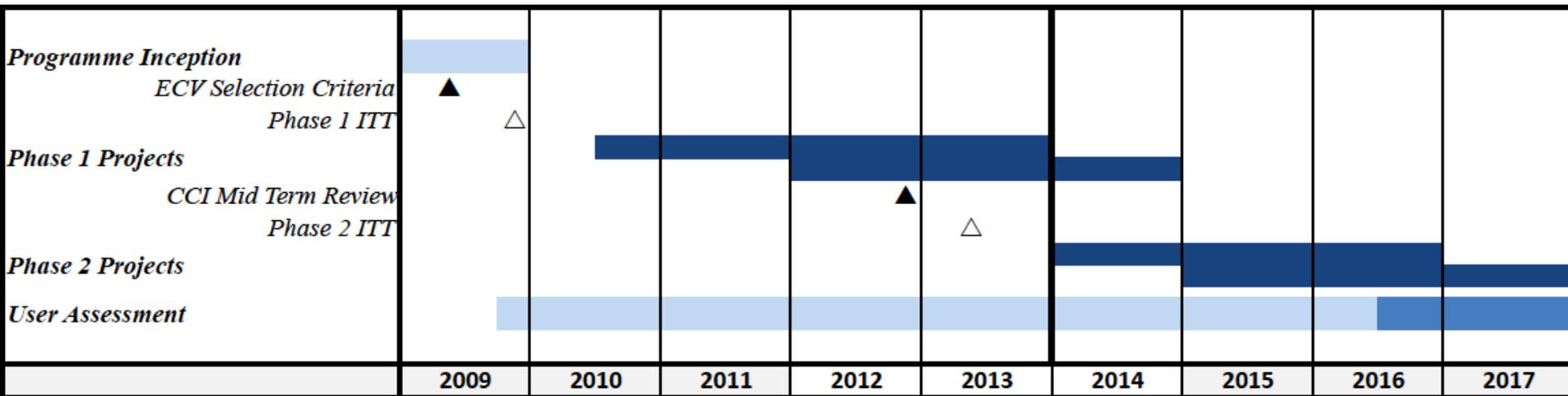
Stage III - Operational ~33 ECVs, ~9 Sectors



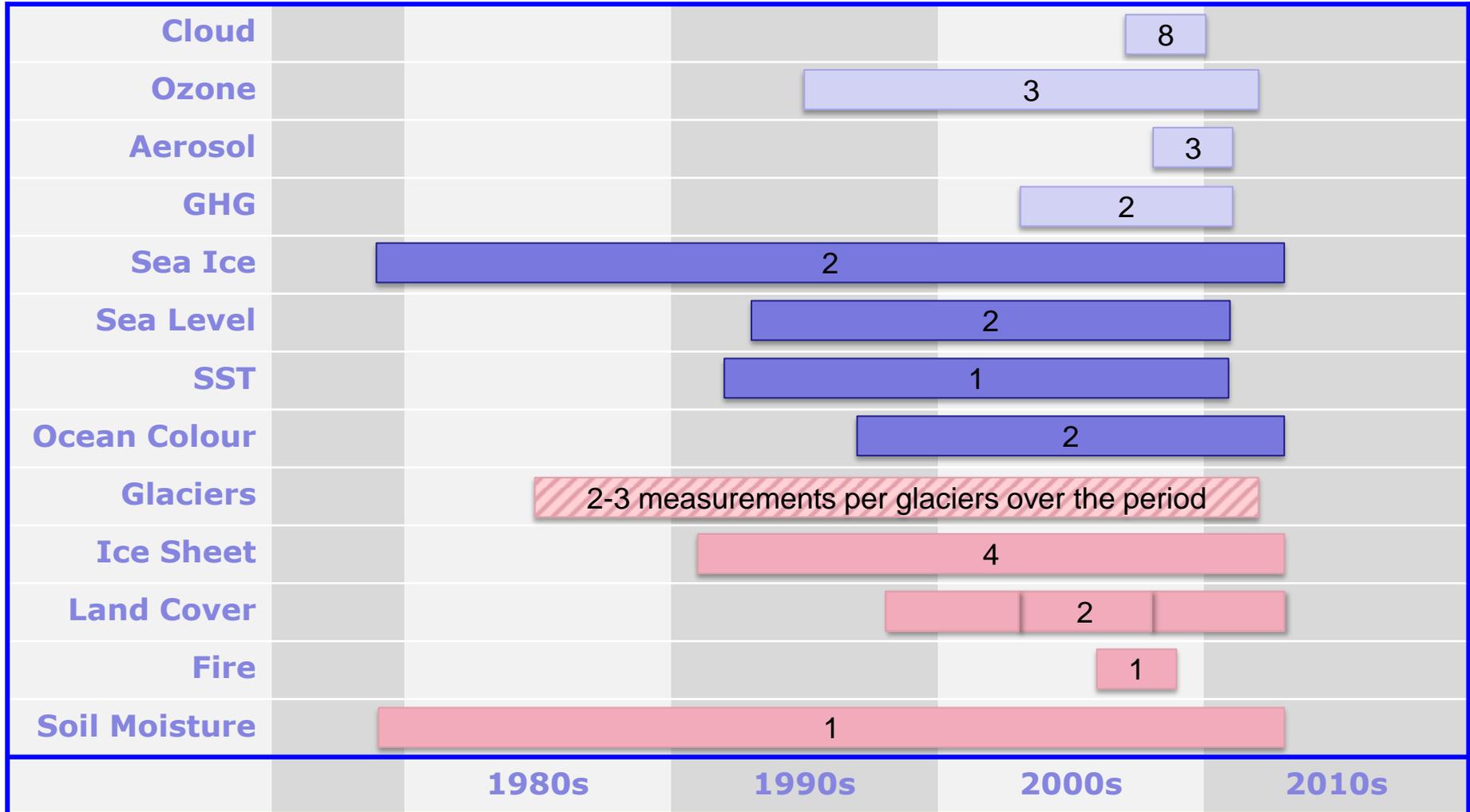
## In the coming year:

- The Statement of Work for the CCI toolbox will be released in Q1 2015.
- Kick-off of Phase 2 for the four remaining projects will be in Q1 2015.
- The kick-off for the CCI Data Portal is expected in Q1 2015.
- The next CMUG Integration Meeting will be at SMHI, Sweden from 26-28 May 2015.
- CCI will be promoted at the 'Our Common Future under Climate Change' conference, 7-10 July 2015.
- The 6<sup>th</sup> CCI Collocation meeting is expected in Q3 of 2015.
  - 29 Sept-1 Oct 2015, ESRIN (Science Leaders' mtg on 28/9 PM)
- ESA and CCI project teams will promote wide use of the ECV data sets.
- ESA will continue European-level coordination on climate: ESA-EUM-EC.

# Programme Schedule



# CCI Products Time Coverage Phase 1



# CCI Products Time Coverage Phase 2

