



Space Climate Observatory

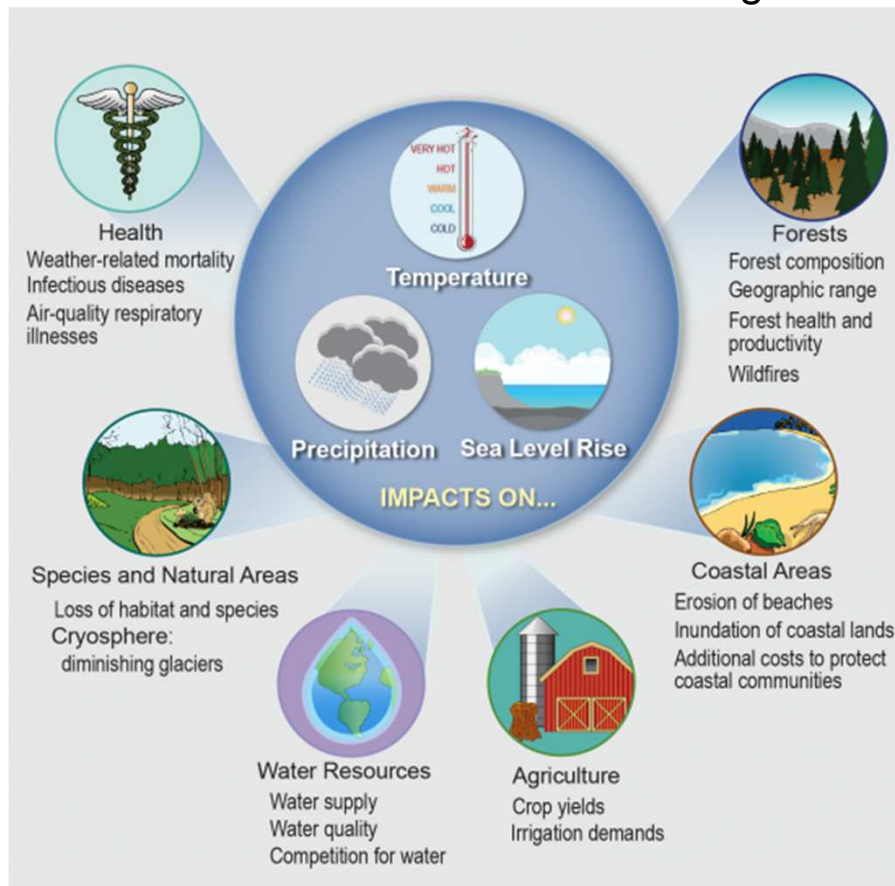
WG Climate Meeting – Marrakech, 20th March 2019

Dr. Selma Cherchali
CNES, SCO Program Director



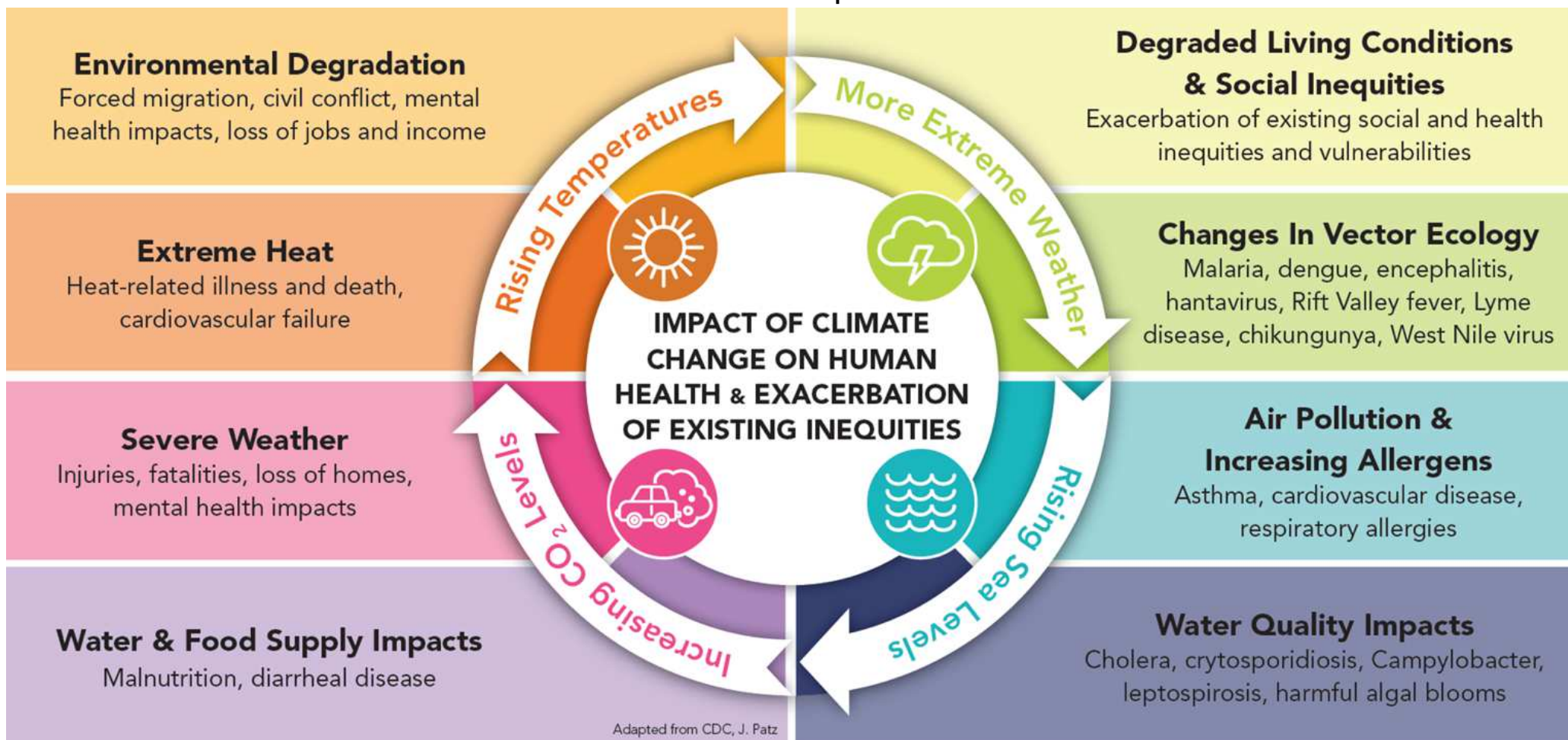
SCO Concepts – Need for a coordinated assessment of Climate Change Impacts

Potential effects of climate change



Source. *Climate Change Impacts in the United States: The Third National Climate Assessment*

SCO Concepts – Need for a coordinated assessment of Climate Change Impacts Societal Impacts



SCO Concepts – Main Objectives



“Space Climate Observatory”

*A world observatory of
the climate change and its impacts*

❖ **Satellite data**

- » Earth observations at regional, national and local level
- » ... and in-situ data, research modelling

❖ **Climate change and its impacts**

- » Humankind, both as anthropogenic causes and as the victims of the impacts (temperature increase, sea level rise and hazards...)

❖ **a joint Observatory**

- » A World Heritage system

→ <http://spaceclimateobservatory.org>

SCO Concepts – Main Objectives

- ❖ Respond to Adaptation needs through international coordination
- ❖ A global monitoring of CC impacts is so far poorly structured
- ❖ Case studies in various contexts have been developed but
 - Many methodological approaches are challenging and/or not shared
- ❖ Contribute to the assessment of impacts of CC in different SBA (water, food security, coastal areas, air quality,..)
- ❖ Precise impact's CC monitoring
 - Regional, National, Local scale
 - Will raise awareness, stimulate and support decision making

Required international coordination specifically focused on impacts of Climate Change

SCO Concepts – Main Objectives

Principles

- ❖ Science based Program
- ❖ Not alone !
 - » A country, an agency, an institution...
could not make it for all the World/Planet
- ❖ Involvement and cooperation with wide range of bodies
 - » GEO, CEOS, CGMS and UN Agencies
 - » National organizations, Ministries, local entities...
- ❖ Building on the exiting capabilities and programs
- ❖ Co-construction
 - » At international but also national level
 - Across sectors, institutions, research community, and sub-national area (territories)
 - » At level of populations
 - Metrics and social indicators to measure the appropriation and acceptance by stakeholders
 - » Communities of development (Sharing of capabilities (expertise, computing))
 - » Make available to others, freely
 - » Exchange of use, best practice



CO DESIGN



SCO Concepts – Need for a coordinated assessment of Climate Change Impacts

SCO Policy Drivers



Illustration by David Parkins
Nature 514, 30–31, Oct. 2014



One Planet Summit – Paris, December 11th, 2017

SCO Concepts – Main Objectives

Precise impact's CC monitoring

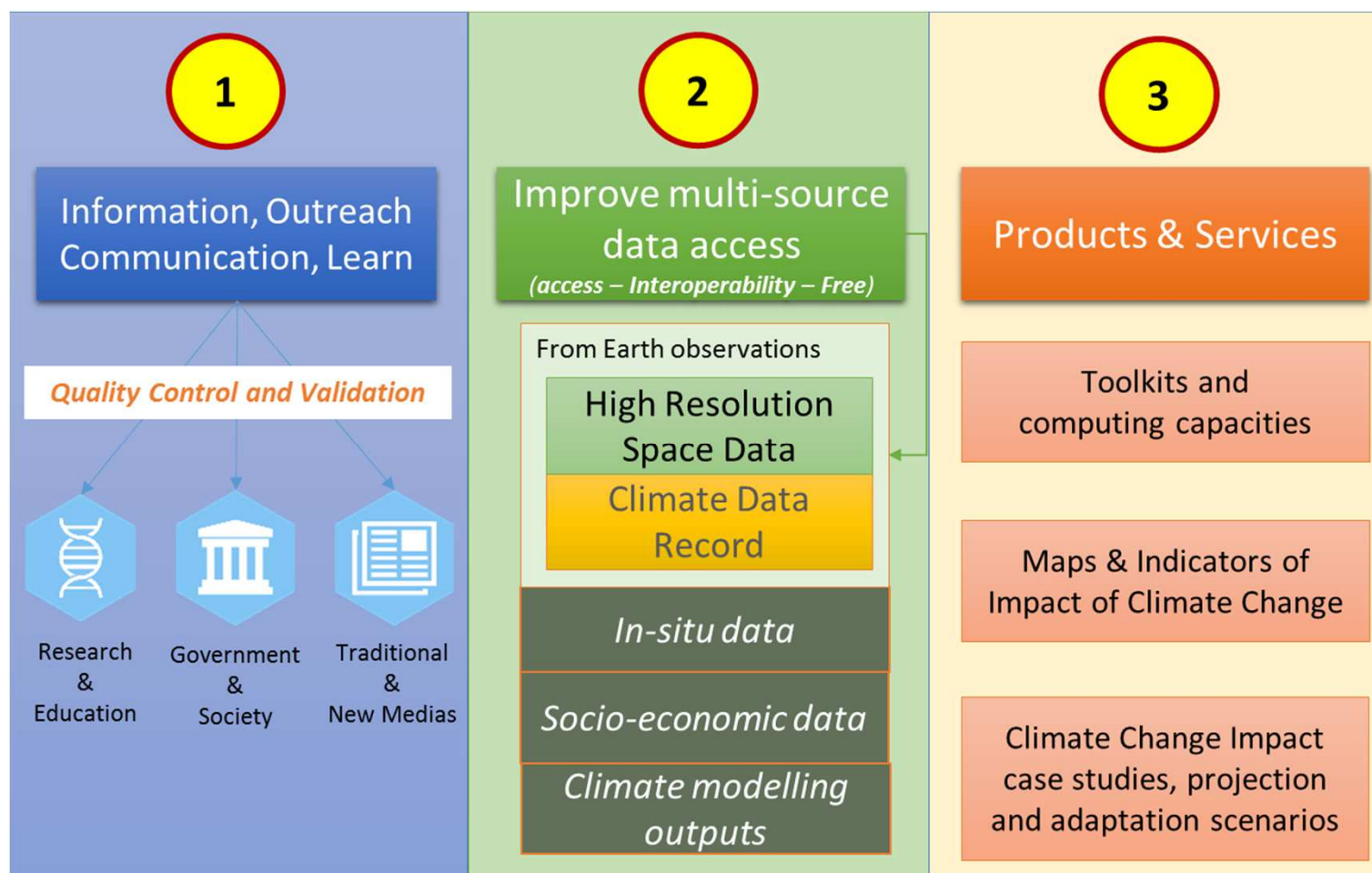
- Regional, National, Local scale

- ❖ By making full access, use and benefit of multi-source data
 - Best use of synergies between data providers (from satellite, in-situ, model, socio-economic research)

- ❖ Co-construction of both knowledge and expertise (scientifically, technically and geographically)
 - Products and services

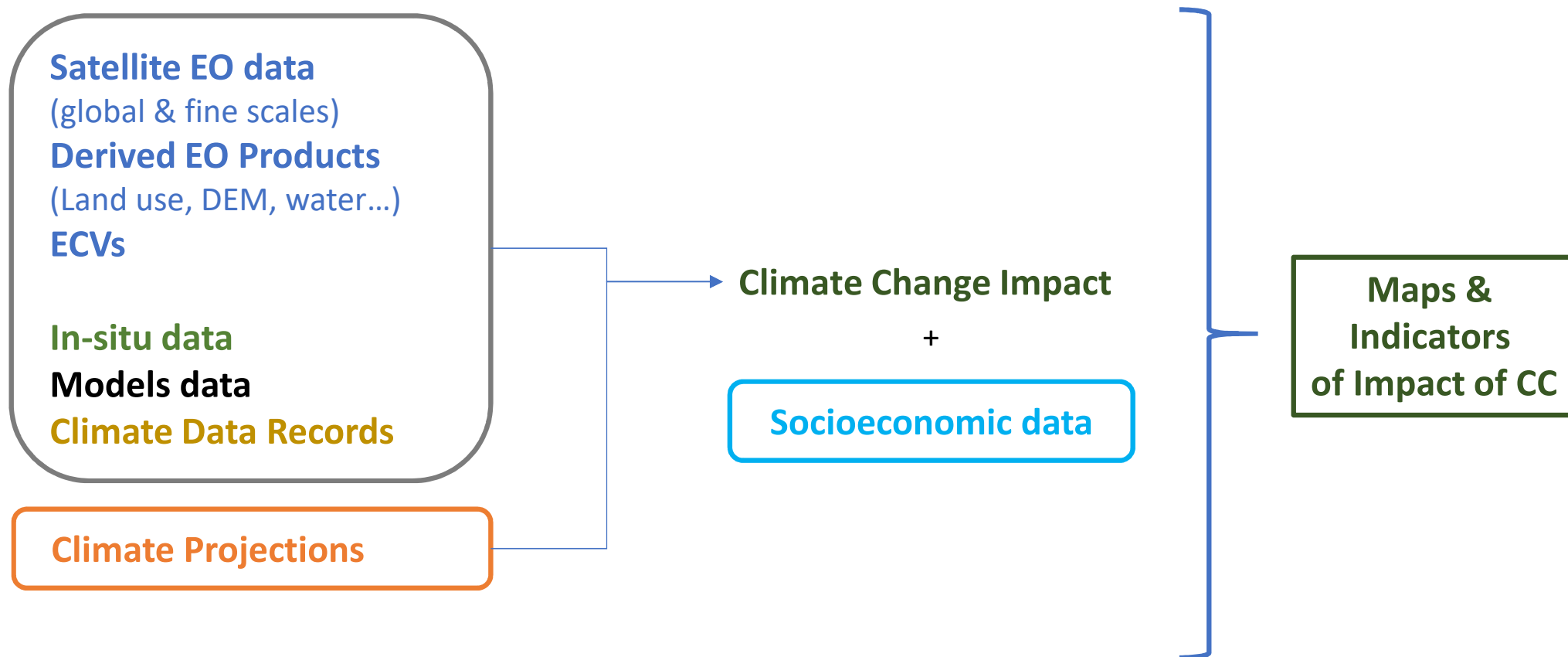
- ❖ Develop effective and relevant communication/outreach activities and educational measures
 - Will raise awareness, stimulate and support decision making

SCO Concepts – Main Objectives



2 – Data access

By making full access, use and benefit of multi-source data



3 – Products & Services

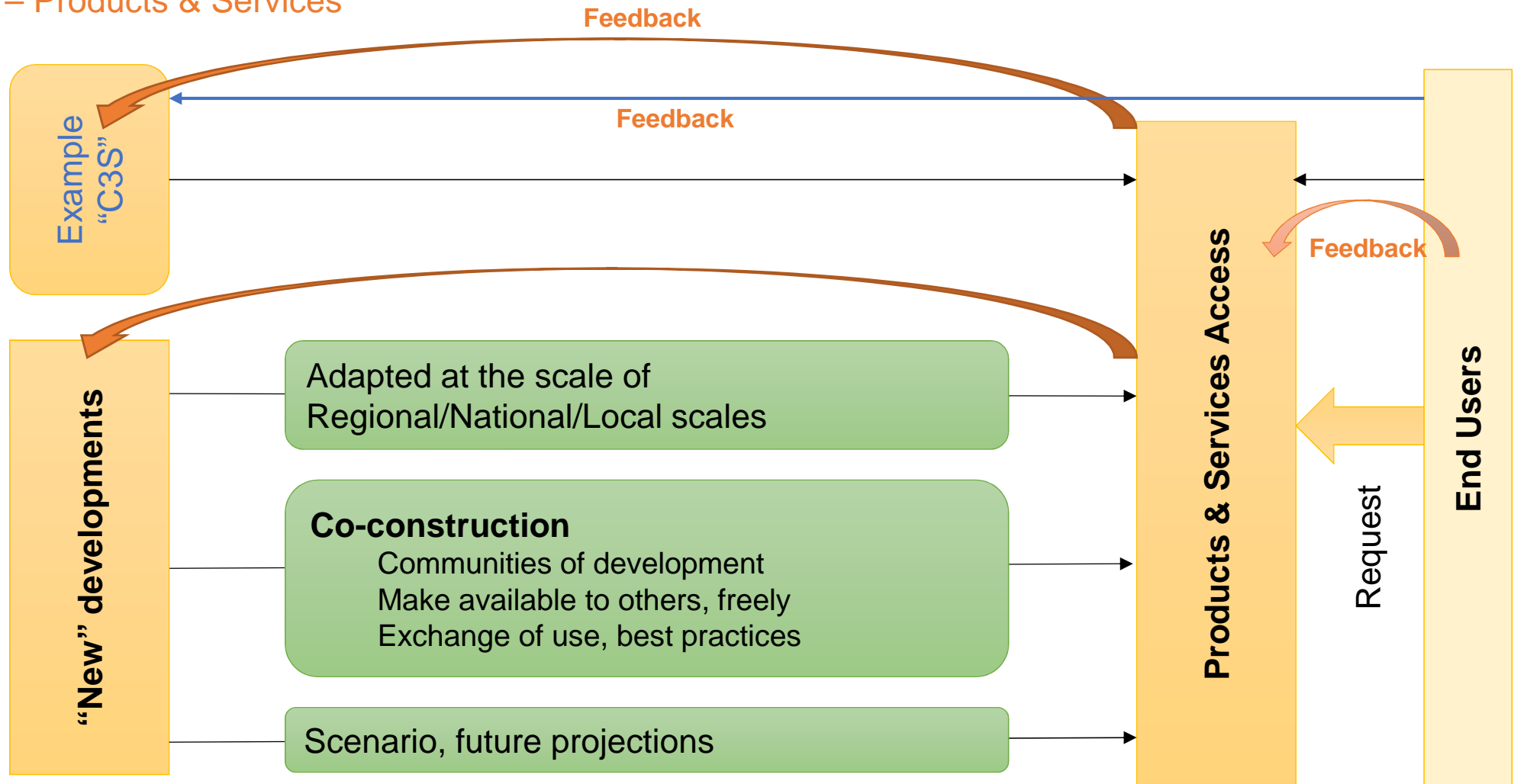
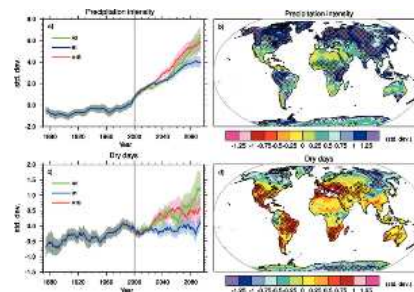
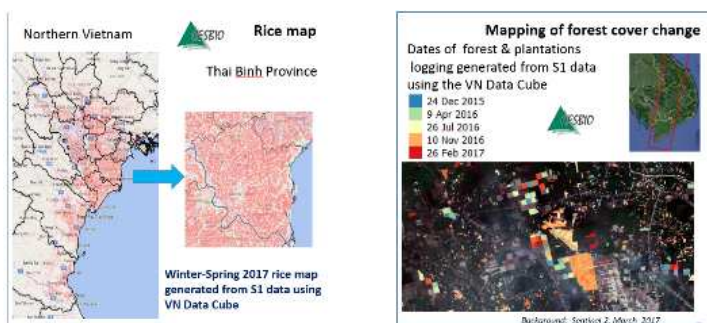
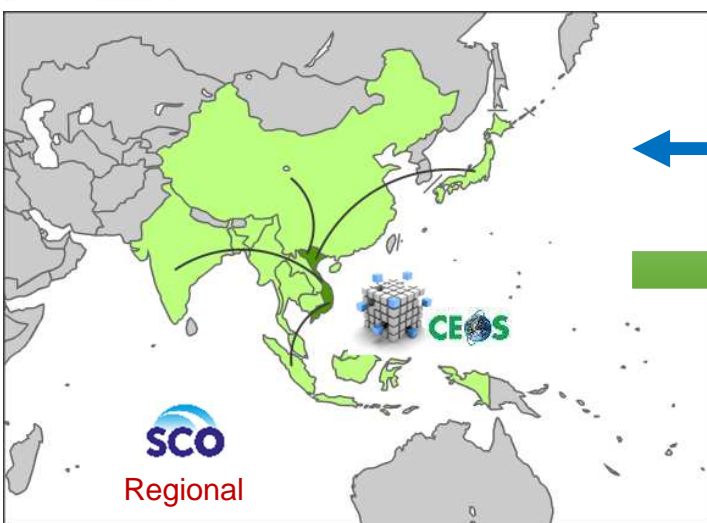


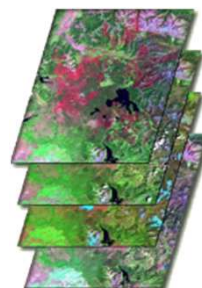
Illustration of future scenario and international contributions



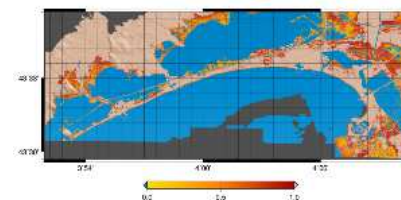
Coordinator: Australia (CSIRO)
 User needs: Coastal areas, Water quantity & quality...



SCO
 International HUB
 Tools, Data, Products, Scenario



Sea level and DEM data combination for the assessment of the local vulnerability to submersions under 1m of sea level rise

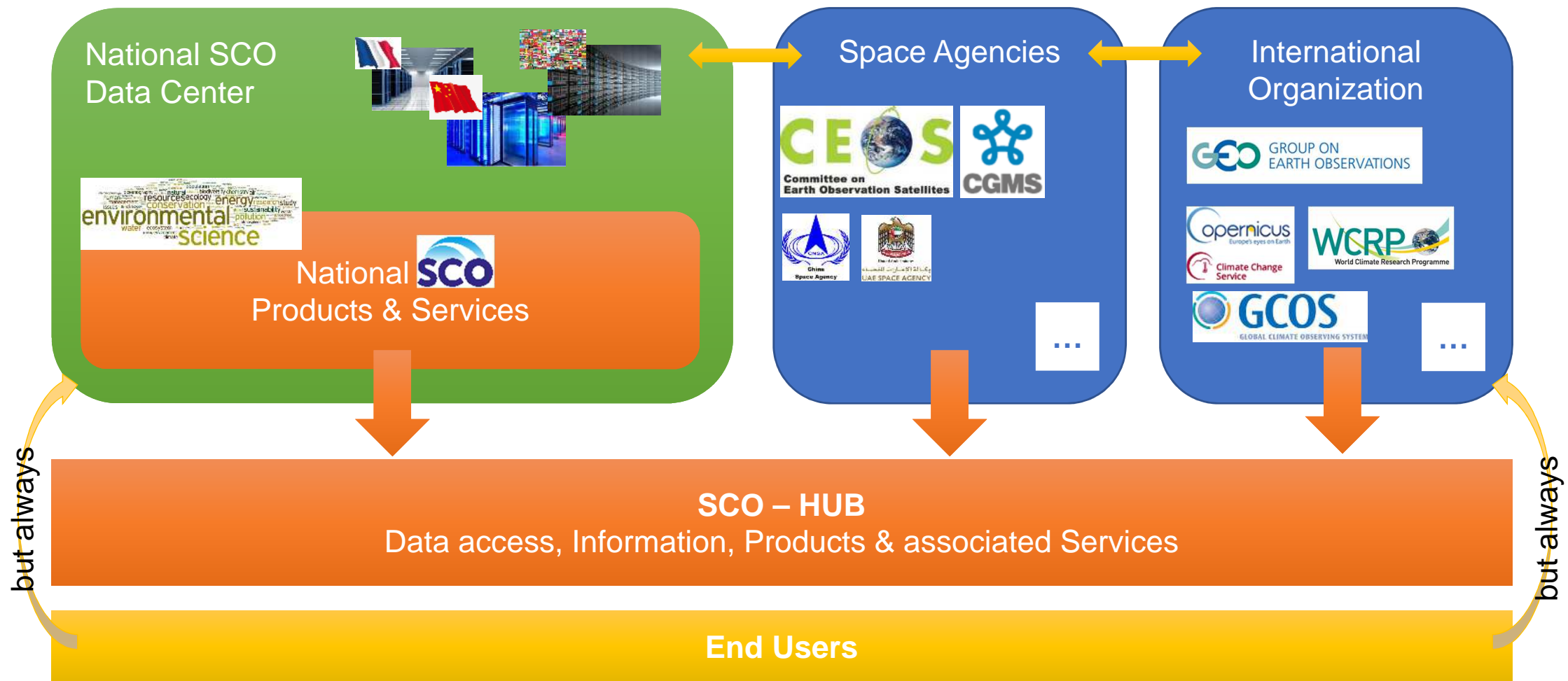


Coastal erosion

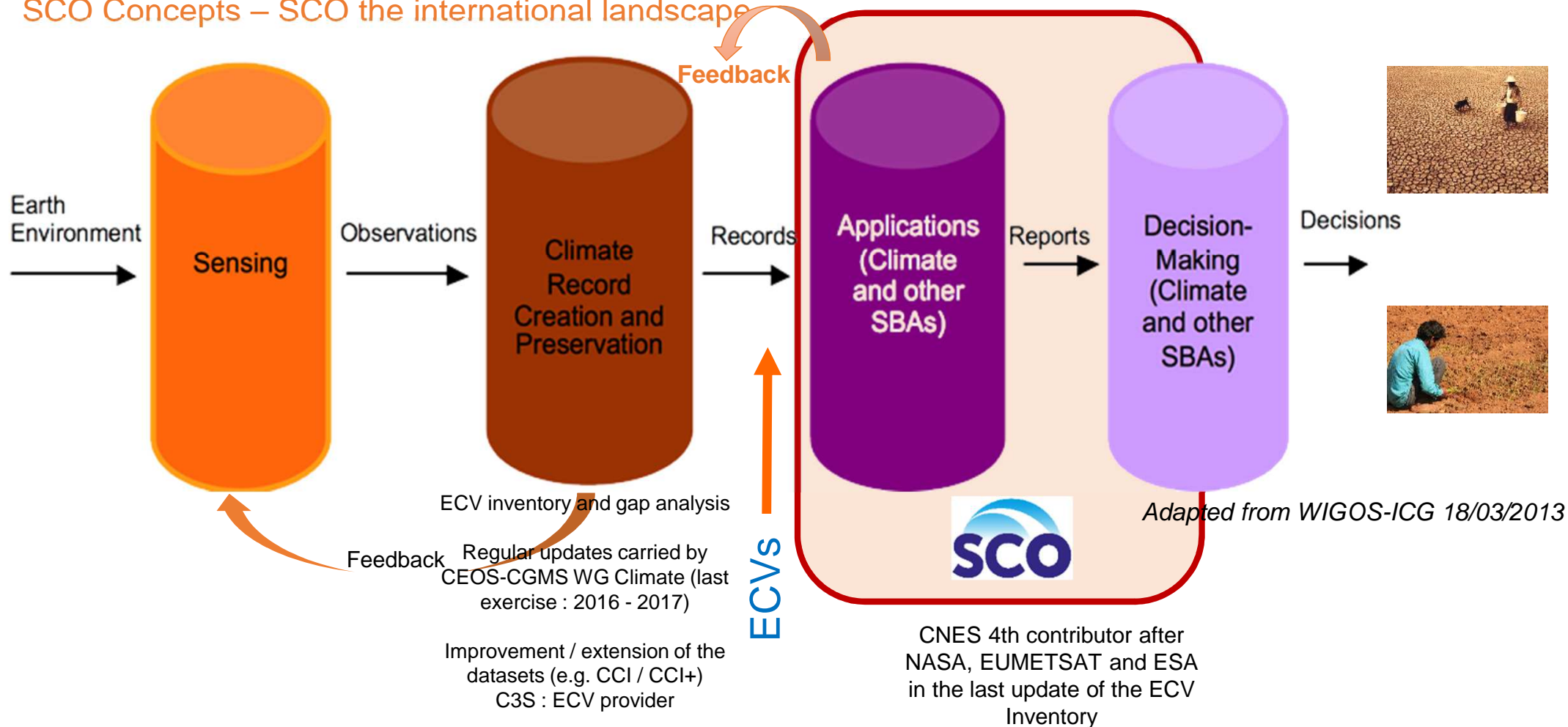


Coordinator: Vietnam (VAST-VNSC-Mekong Commission)
 User needs: Foot security (Rice), Forest...

SCO Concepts – SCO the international landscape



SCO Concepts – SCO the international landscape



Reference Document: “Implementation of the climate monitoring architecture from space”, 2013

Space Climate Observatory Meeting Friday, 1st February 2019 - CNES, HQ, Paris

- ❖ Objective #1: Discuss and converge on the SCO concepts
- ❖ Objective #2: Discuss and build on potential contributions and commitments by partners in SCO implementation
- ❖ Objective #3: Discuss and converge on implementation and planning
- ❖ Objective #4: Discuss and converge on governance

Agenda Meeting Friday, 1st February 2019 - CNES, HQ, Paris

9:00	Welcome Remarks <ul style="list-style-type: none"> Jean-Yves Le Gall - CNES President Dr. Marie H�el�ene Vuillemin Tusseau – Scientific Director of Environment, Agronomy, Ecology, Earth System and Universe Sciences for the French Ministry of Higher Education, Research and Innovation
9:10	
9:20	Strategic importance of observing climate change and its Environmental Impacts from Space – Dr. Anny Cazenave – Director for Earth Sciences at the International Space Science Institute (Bern, Switzerland)
9:30	Objectives of the meeting – Dr. Selma Cherchali (CNES)
9:40	SCO Concepts ( SCO Program Definition): Dr. Selma Cherchali <ul style="list-style-type: none"> Need for a coordinated assessment of Climate Change Impacts SCO main objectives SCO in the international landscape SCO Users and Service Discussion: All
10:30	Coffee break – Group Photo
11:00	SCO Concepts Discussion: All
Significant experiences in Climate Change impact assessment: Presentations	
11:20	<ul style="list-style-type: none"> Cooperation opportunities under SCO in the Australia - South Pacific region– Dr. Alex Held (CSIRO)
11:30	<ul style="list-style-type: none"> China SCO Data & Information Service Center (DISC)- Dr. Zhengqiang Li (CNSA)
11:40	<ul style="list-style-type: none"> European Climate Change Service (C3S) – M. Hugo Zunker (European Commission)
11:50	<ul style="list-style-type: none"> Indonesia Satellite Based Meteorological Disaster Early Warning System – M. Halimurrahman (LAPAN)
12:00	<ul style="list-style-type: none"> Climate change impact indicators on water resources in Morocco based on spatial data – Dr. Amal Layachi (CRTS – Maroco)
12:10	<ul style="list-style-type: none"> Mexican Space Application through Eos for monitoring climate impact – Dr. Francisco Javier Mendieta (AEM)
12:20	<ul style="list-style-type: none"> Toward a Space Climate Observatory in Vietnam – Dr. Vu Anh Tuan (VNSC)
12:30	<ul style="list-style-type: none"> Potential UAE Project Contribution towards SCO - M. El Kaissi (Eau, Space Government - United Arab Emirates)
12:35 Lunch Offer	
14:00	SCO implementation and planning <ul style="list-style-type: none"> Presentation of the proposal ( SCO Program Definition): Dr. Selma Cherchali Discussion : All
15:15	SCO International governance <ul style="list-style-type: none"> Presentation of the proposal ( SCO Program Definition): Dr. Selma Cherchali Discussion on the principles: All
16:30	SCO International Protocol Agreement: Emilie Le Bert (CNES)
16:45	Coffee break
17:15	Summary: Dr. Pierre Tabary (CNES) Next steps: Dr. Selma Cherchali (CNES)

Space Climate Observatory



Space Climate Observatory Meeting Friday, 1st February 2019 - CNES, HQ, Paris



SCO 1st International Meeting – CNES HQ Paris, 1st February 2019

- ❖ **SCO 1st International Meeting** – CNES HQ Paris, 1st February 2019
- ❖ More than **50 participants** from all over the world
- ❖ Representing more than **25 national space and national agencies**, and **4 international organizations**
- ❖ Very fruitful interactions which clearly demonstrates a **common willingness to act together towards a common goal** → joining forces and collaborating to address the **monitoring of climate change impacts**

**Ceremony Signature of the SCO
Joint Declaration of Interest, Biarritz
August 24-27, 2019
Set up of a Steering Committee**



Summary – Scope and perimeter

- Program definition document greatly appreciated
- The scope of SCO is now much clearer.
- The articulation of SCO with other international programs and initiatives is better understood (“pulling the same rope in the same direction”, “SCO really bridges a gap“, ...)
- The focus on the climate change impacts (pillar 3 of the space-based architecture for climate monitoring) is highly appreciated ;
- It is recognized that there is a strong need to structure international collaboration on climate change impact monitoring
- Need to adopt the high-quality standards and guidelines that have been developed (in particular in the frame of WG Climate for the production of the ECVs) for all information generated within SCO. Important for the credibility of the community and the consistency of the communication.

Summary – Scope and perimeter

- SCO seen as a very good way to bridge the gap between science and society, and to develop trans-disciplinary collaborative research and development (e.g. coupling environmental and socio-economic data)
- Essential to build upon local (e.g. traditional knowledge) / national expertise / tools / initiatives / infrastructures
- SCO could be a unique opportunity (“multiplier”) to “industrialize” or “replicate” local climate change impacts studies / initiatives and generalize them massively.
- SCO is seen as a means to also catalyze national coordination and effort on CC impacts;
- SCO is seen as a very good way to obtain more feedbacks from end-users, maximize the use of CDRs and gain insight into the needs for future space programs (e.g. develop of new indicators).
- Scope of SCO is wide and ambitious, in particular its communication and outreach component. Will need further discussions.

Summary – National experiences in CC impact assessments

- Numerous National plans/strategies in place to understand, monitor and adapt CC impacts;
- Contribution of spatial technologies/space capabilities in understanding Climate, for the management of natural resources (SDG goals)
- Develop of indicators for decision making processes
- Strong involvement of the research community in the development/validation/use of indicators;
- Regional/national/local scales of key importance:
 - key interests/requests from local stakeholders,
 - Easier coordination (e.g. implementation of regional RI Datahub/platform)
 - Ready to use applications (end-users requests);
 - Methods and best practices transferable.
 - Make best use of existing initiatives and programs related to impacts CC (e.g C3S)
- Free and open data access promoted;
- Interoperability : should use existing standards to be chosen between SCO members (like WMO...)

Summary - Implementation

- It is time for action : Base of the SCO implementation – not only politic
- Need to go fast but also step by step – not get locked wit chicken and eggs issues
→ Need prompt feedback on the SCO program definition document
- Everybody is invited within the next weeks to react to the draft declaration of interest that will be proposed just after this meeting.
- Contribution are based on existing programs and in kind participation at the start – This may evolve based on progress

Technical Outcomes

❖ Improved multi-source data web-based access

- Free access to existing Data products generated outside the SCO
- Free access to Data products generated by the SCO and SCO Contributors

❖ Full description of Climate Change impact Case Studies performed

- Climate change impact descriptive sheets
- Open source code implementing the specifically designed impact study

SCO Presented at the opening and closing of the 2nd SPB Forum Session

SCO Confirmed as a model project by the SPB Forum Data Working Group chaired by Gilberto Camara (GEO)

GEO Secretariat proposed that SCO GEO Initiative (under evaluation) participates to the GEO Knowledge Hub



Nairobi 8-10 March 2019

SCO Presented on the SPB Forum Stand with scenarios and use cases presented

SCO Presented on the World Situation Room Stand as an example of scientific & data input

Nairobi 14 March 2019

3rd Edition of the One Planet Summit

Participation of Jean-Yves Le Gall in the French Presidential Delegation to represent the SCO

Arona Diedhiou (Climate Expert – IRD, IPCC) cited SCO as a Major Program on Climate Change

Some preliminary feedbacks

- WG Climate Chair (CEOS-CGMS-GCOS) recommendations :
 - that it might be advantageous if SCO were to address pillar 3 of the architecture, in order to enhance the uptake of CDRs into applications
- GCOS is pleased that it's role has been recognised and requested that planned feedback mechanisms and the **advisory role of GCOS** be maintained (See Governance Part)
- WMO confirmed the finding from the WMO/EC earlier case studies that satellite data fulfils only parts of what is needed for applications. *These original case studies done in 2013 should be seen as very embryonic, and maybe the SCO could be used to develop further and more detailed case studies of satellite applications for climate research/services*

SCO Concepts – SCO the international landscape

- From the perspective of WG Climate (October 2018), the SCO might become useful in the context of CEOS/CGMS if it were to:
- Focus on impact studies and the tailoring of the associated inputs, with a particular emphasis on the illustration/promotion of the use of CDRs, as well as (where appropriate):
 - Identifying opportunities conditions for delivering further Climate Data Records
 - Suggesting optimization of the planning of future satellite missions and constellations to expand existing and planned Climate Data Records
 - Support GCOS in defining observational requirements for particular applications/services

Next steps

- Signature of the Joint Declaration of interest open for signature from first week of April
- Ceremony of the signature in Biarritz (25-27 August) next to G7 meeting
- Set up the Steering Committee
 - Improvement of the Program Definition Document
 - Implementation Plan for the next two years
 - Governance : put in place the different governing structures (General Assembly, Scientific – Users -Observers Committees).
 - Develop **concrete outputs** (e.g. indicators and scenarios) in targeted areas and defined them as “proofs of concept” : pilot use cases
 - » Develop an “extensive” knowledge on **impact case studies worldwide**

SCO Concepts- SCO Users and Service

- SCO Added-Value
- **Key role of Earth Observation data (Satellite and in-situ)**
 - High resolution data, multi-missions data, ECV
 - Expert tools and processing chains
 - In-situ data
- **Data, results and indicators produced from studies**
 - Study reports
 - Specific indicators
- **International coordination**
 - Facilitating agreements between different initiatives and partnership
 - Methodology reproduced, adapted in quasi similar contexts
 - SCO missions/objectives will be deployed in each country by national stakeholders through their dedicated infrastructure and organization
- **An international shared Data portal**
 - Sharing input data, protocols, knowledge and processing methodology
 - International dissemination – products and associated expertise
 - Improving global knowledge and awareness about the impacts of CC – available to all