



Climate Services

Clare Goodess

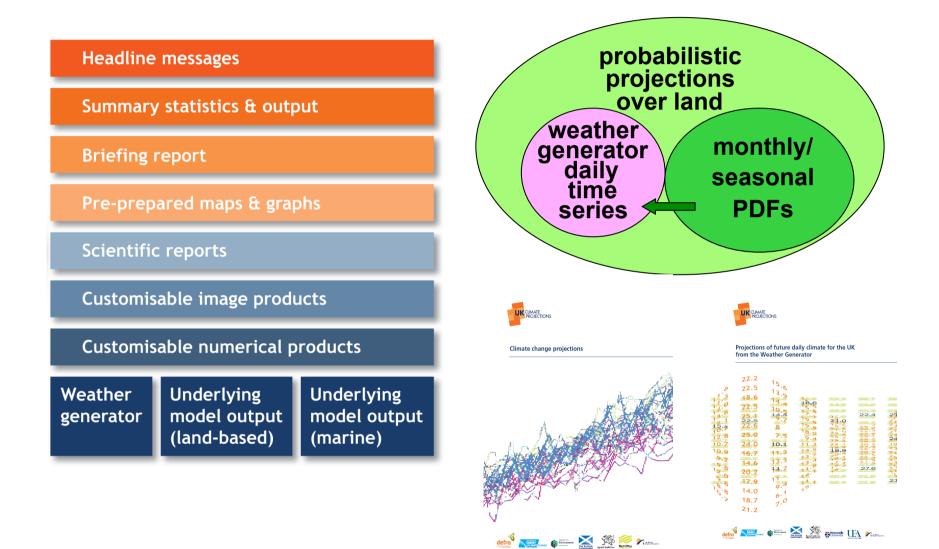
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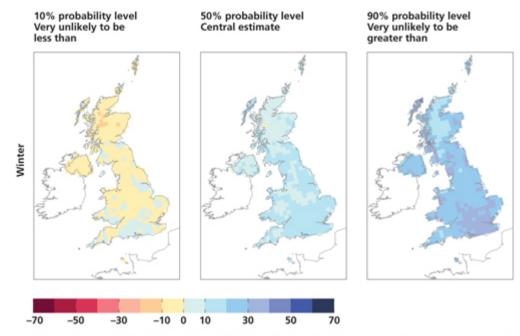


First CLIM-RUN workshop on climate services 17/10/12

UKCP09 national climate change projections

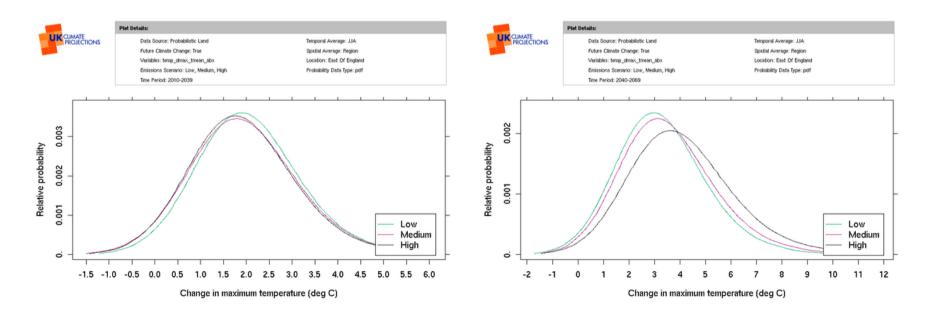


http://ukclimateprojections.defra.gov.uk/



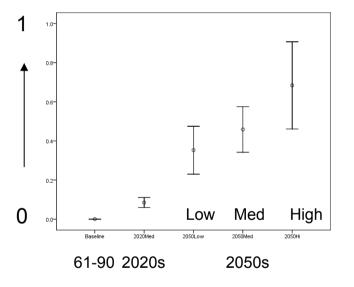
Maps of change in precipitation (%) on the wettest day in winter.2050s, medium emissions scenario.10%, 50% and 90% probability levels.

Change in precipitation (%) on the wettest day of winter for the 2050s, Medium emissions scenario



PDFs summer Tmax, East of England, 2020s (left) & 2050s (right)

Indices based on UKCP09 weather generator output (100 x 30 years – sampled change factors from PDFs) processed using the threshold detector



Average annual number of heat waves (*Heat Weather Watch Plan* definition: Tn > 15°C & Tx > 30°C for at least 2 consecutive days) for Cambridge for baseline (left) and future periods (2020s medium emissions; 2050s low, medium and high emissions). Upper and lower 95% confidence intervals across 100 weather generator runs/ change factors are shown.

A WCC-3 Initiative

We, Heads of State and Government, Ministers and Heads of Delegation present at the High-level segment of the World Climate Conference-3 (WCC-3) in Geneva, noting the findings of the Expert Segment of the Conference:

DECIDE

to establish a Global Framework for Climate Services (hereafter referred to as "the Framework") to strengthen the production, availability, delivery and application of science-based climate prediction and services.

Source: World Climate Conference-3 Declaration, Geneva, September 2009.





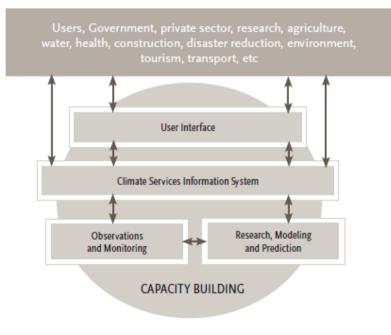
Defining climate services



High-level Taskforce for the Global Framework for Climate Services

Definition of a climate service from the Taskforce report (May 2011 to WMO congress):

• Climate information prepared and delivered to meet a user's needs.



Proposed components of GFCS

Defining climate services

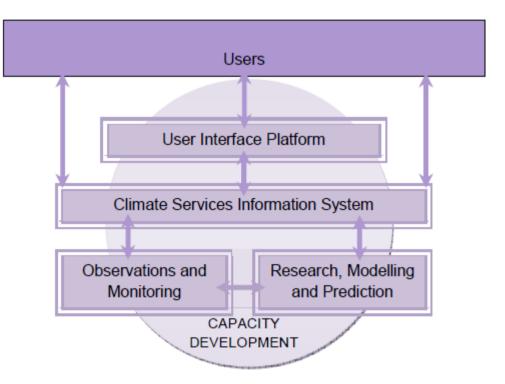


Draft GFCS Implementation Plan

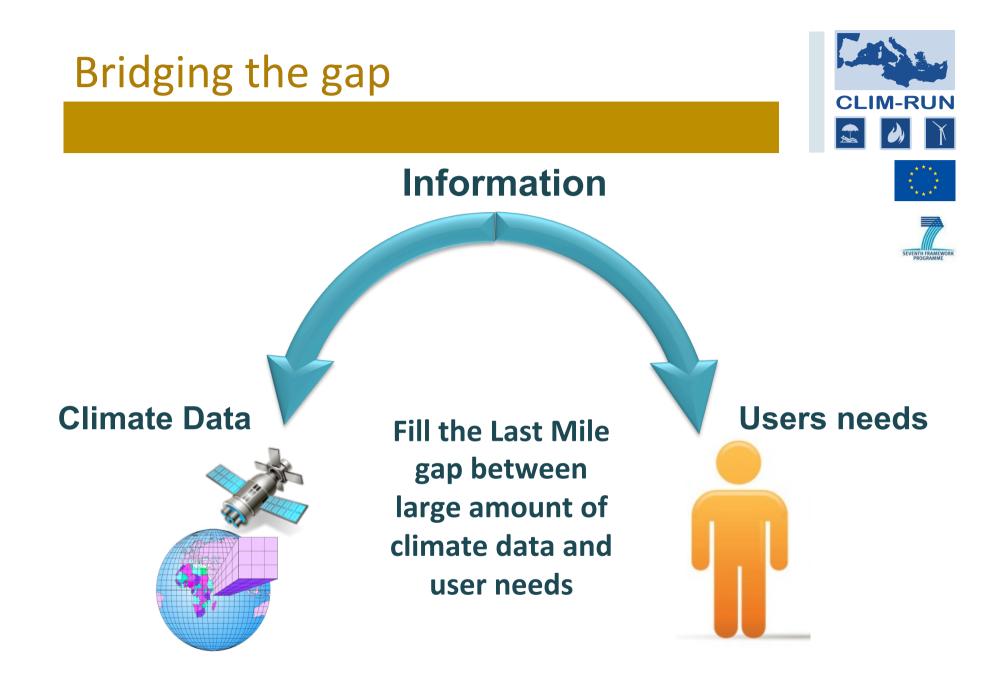
WMO Congress – Extraordinary session 29-31 Oct 2012

Climate service:

Providing climate information in a way that assists decision making by individuals and organizations. A service requires appropriate engagement along with an effective access mechanism and must respond to user needs.



5 components/pillars of GFCS



Defining climate services



But what sort of 'information'?

From the High-level Taskforce full report: Climate services encompass a range of activities that deal with generating and providing information based on past, present and future climates and on its impacts on natural and human systems. Climate services include the use of simple information like historical climate data sets as well as more complex products such as predictions of weather elements on monthly, seasonal or decadal timescales, also making use of climate projections according to different greenhouse gas emission scenarios. Included as well are information and support that help the user choose the right product for the decision they need to make and that explain the **uncertainty** associated with the information offered while advising on how to best use it in the **decision-making process**.

http://www.wmo.int/pages/gfcs

DEFINITION & APPROACH

A CLIMATE SERVICE delivers tailored climate information, consulting, training and customized decision tools to end users aiming at reducing the vulnerability of their activities and optimize investments in view of climate variability and change.

A CLIMATE SERVICE is built upon an iterative and mutual learning process involving end-users and providers.

How can I invest, manage, adapt?

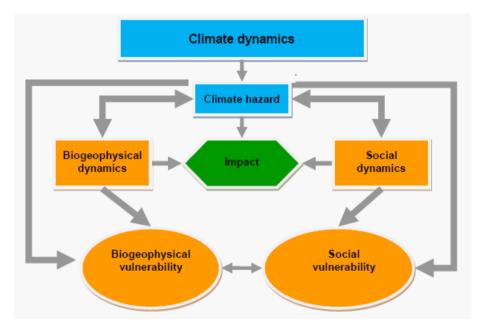






An integrated assessment for 11 Mediterranean case studies (urban, rural and coastal)

CIRCE case-studies Integrating Framework (CCIF) developed by Maureen Agnew and Clare Goodess, CRU



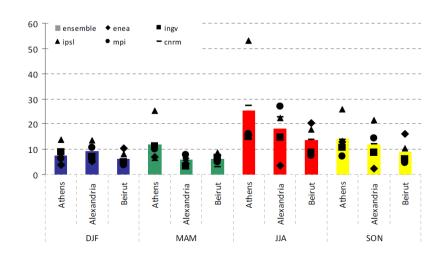
CIRCE FP6 project ended June 2011 Regional Assessment of Climate Change in the Mediterranean: 3 vols/5 parts - Part 5 on the case studies, Springer, due December 2012

http://www.cru.uea.ac.uk/projects/circe



'Bottom up' with regional stakeholders 'Top down' indicator approach

> Projected changes in number of very hot nights (2021-50 vs 1961-90) for the urban case studies from CIRCE RCMs



Mediterranean Perspective

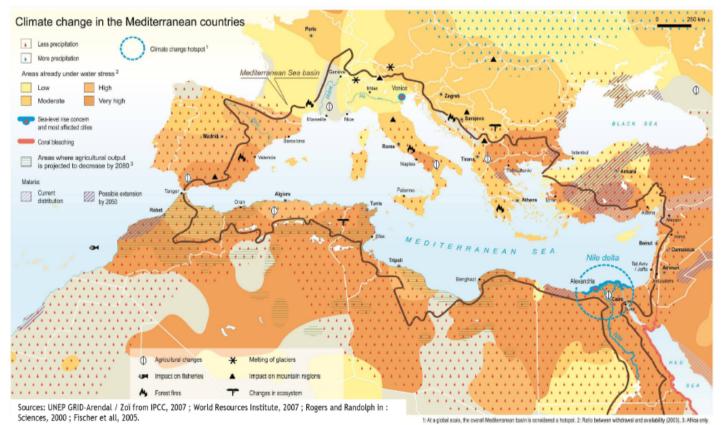


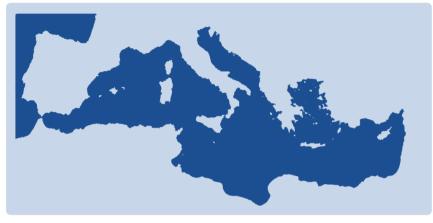
Figure 1.1. Synthesis of the climate change effects and vulnerabilities in the Mediterranean (Plan Blue 2009)





Climate Local Information in the Mediterranean region Responding to User Needs





CLIM-RUN

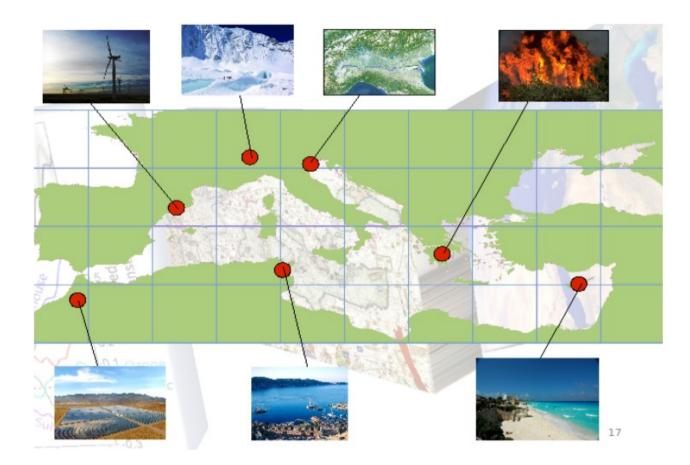


•Developing stakeholder-led climate services

•A real-world context for bringing together experts on the demand and supply side of climate services

ENEA(Italy) EEWRC(Cyprus) CNRM(France) ICTP(Italy) IC3(Spain) NOA(Greece) CMCC (Italy) TEC(France) PlanBleu(France) PIK(Germany) UEA(UK) GREVACHOT(Tunisia) JRC (Spain) DHMZ (Croatia) USMD(US) UC(Spain)

http://www.climrun.eu





<u>Tourism</u>: Tunisia, France (Savoie), Cyprus, Croatia <u>Energy</u>: Spain, Morocco, Cyprus, Croatia <u>Wild Fires</u>: Greece (Spain)

Integrated Case Study: North Adriatic – Veneto/Venice, Croatia

CLIM-RUN Objectives

This mornings talks focus on the first two objectives:

How to identify user needs?



- How to initiate & maintain/develop stakeholder involvement?
- How to prepare modeling tools & observed data and products?
- How to develop a Climate User Interface prototype?
- How to develop a more generic protocol?
- How to develop Climate Services training?

The timescales considered range from seasonal forecasts, through decadal prediction, to climate projections

Key CLIM-RUN stages



- Stage setting (complete)
 - first stakeholder workshops
- Mapping the issues (complete)
 - perception and data needs questionnaires
- Iterative consultation and collaboration (in progress)
 - including two training workshops (this one & Aug 2013)
- Consolidation and collective review/assessment
 - second stakeholder workshops (February 2013)
- Going forward: synthesis and recommendations
 - final workshop and end of project (February 2014)

Identifying and selecting stakeholders





e.g., Venice case study used a ranking scheme from social scientists based on:

- importance
- influence
- effects
- relevance
- attitude

	Level	Veneto	Friuli Venezia Giulia				
Macro	National	Civil Protection, regional office	Civil Protection, regional office				
1	Inter-regional	Autorità di bacino delle Alpi Orientali Autorità di bacino dell'Alto Adriatico Autorità di bacino del Po					
	Regional	A RPAV Segreteria regionale per l'ambiente Segreteria regionale per le infrastrutture e l'urbanistica Genio Civile (Regione Veneto) Segreteria regionale per la cultura e turismo Pesca ed acquacoltura Servizio idrico integrato: ATO Industria Energia	 ARPA FVG Sviluppo sostenibile Urbanistica e pianificazione territoriale (incluso infrastrutture) Aree naturali e biodiversità Ente tutela pesca Servizio idrico integrato Industria Energia Turismo 				
	In dependen t Authorities Parks and reserves	 Port Authoritiy of Venice A SPO Chioggia Magistrato delle acque di Venezia Consorzio di Bonifica Adige Po Consorzio di Bonifica Delta Po Adige Consorzio di Bonifica Adige Euganeo Consorzio di Bonifica Bacchiglione Consorzio di Bonifica Acque Risorgive Consorzio di Bonifica Veneto Orientale Parco Regionale Veneto del Delta del Po 	 Port A uthoritiy of Trieste ASPO Monfalcone Consorzio di Bonifica Bassa Friulana Consorzio di Bonifica Cellina Meduna Consorzio di Bonifica Ledra Tagliamento Consorzio di Bonifica Pianura Isontina 				
	Provinces	 Riserva Naturale Bocche di Po Riserva Naturale Integrale Bosco Nordio Venezia 	 Riserva Naturale della Foce dell'Isonzo Riserva Naturale Foci dello Stella Riserva Naturale della Valle Canal Novo Riserva Naturale della Valle Cavanata Riserva Naturale delle Falesie di Duino Riserva Naturale delle falesie di Duino Riserva Naturale della Valle Cavanata Riserva Naturale della Valle Cavanata Biotopo Magredi di San Canciano Trieste 				
		 Rovigo 	• Gorizia • Udine				
Micro	Municipalities	 San Michele al Tagliamento Caorle, Eraclea Jesolo Cavalino-Treporti Venezia Chioggia Rosolina Porto Viro Porto Tolle 	 Muggia Trieste Duino Aurisina Monfalcone Staranzano Grado Marano Lagunare Lignano Sabbiadoro 				

Collaborating with stakeholders



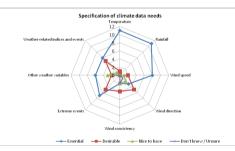
The 'who' and the 'what'

• Who are the climate services stakeholders?

– Why is climate variability and change relevant to them?

– How do climate issues fit within their decision making mechanisms and their perception of risk?

- <u>What</u> do they need/want from climate services?
 - Specific data
 - Analysis tools
 - Guidance and training
 - Other things.....



Information has come from:

- Perception & data needs questionnaire
- Stakeholder interviews
- Local workshops (15 events)

WP/Sector	Location	Date – All 2011	Number attending (& invited)	Language	Questionnaires (Q) and Interviews (I)
WP5/Tourism	Hammamet, Tunisia	4 June	15	French	
	Savoie, France	19 Sept.	15	French	38 Is done prior to workshop and subsequently
	Zagreb, Croatia	21 Sept.	15 (60) Includes 8 DHMZ/UNDP	Croatian	7 Qs completed during workshop
	Nicosia, Cyprus	31 Oct.	2 (6) organisations	English	7 Qs from 4 organisations completed after workshop
	Hammamet, Tunisia	18 Dec.	18	French	18 Is done during and after workshop
WP6/Fires	Athens, Greece	28 Sept.	15 (18)	Greek	13 Qs completed during workshop (5 research/ academic)
WP7/Energy	El Jadida, Morocco	3-5 May		English	8 Is done
	Casablanca, Morocco	6 May	12	English	Basic Q circulated during workshop
	Barcelona, Spain	27 May	4	English	Basic Q circulated during workshop
	Milan, Italy	8 June		English	Basic Q & 10 conversations with exhibitors
	Zagreb, Croatia	15 June	29 (60). Includes 13 DHMZ/ UNDP	Croatian	12 Qs completed during workshop
	Berlin, Germany	15 June		English/ German	Informal discussions with 40 participants. 4 Qs afterwards.
	London, UK	4 July		English	Conversations with some of 60 network event participants
	Nicosia, Cyprus	7 Nov.	3 (6) organisations	English	3 Qs from 1 organisation completed after workshop
WP8/Integrated	Zagreb, Croatia	See above			
	Venice, Italy	13 September	20 (40)	Italian	13 online Qs completed after workshop
	Zagreb, Croatia	See above			

Identifying stakeholder needs



need? In addition to temp/prec and derived indices/extremes:

- Wind (speed, dir., 'consistency') snow, humidity, cloud
- Radiation (esp. DNI for solar energy)
- Sea bathing water T, SLR, storm surge, wave height
- Local winds (Bora, Scirocco) and dust storms
- Tourism comfort indices & Fire Weather Index

More interest in next 20-30 years (50 years at most) i.e., seasonal/decadal rather than 'climate' timescales

Meeting stakeholder needs



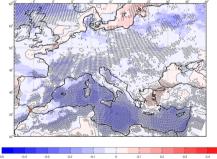
How to meet stakeholder needs?

- 'Translation' process Climate Expert Team (CET)
- Categorising needs (observations/simulations):

0 not possible to provide; 1 already available;

2 easy to provide; 3 able to provide, but with a lot of work

Production of first examples of products and outputs



Mean change in wind speed [m s⁻¹] at 10 m height projected by 16 RCMs (~50 km resolution) for 2040-2050 with respect to 1990-2000. Hatched areas represent areas where more than 66% of the model agree in the sign of change.

- Definition of new modelling tools required
- Iterative discussion with stakeholders (through SET)



Stakeholder engagement:

- difficulties and differences (between and within case studies) in level of engagement (related to expertise/motivation)
- so need to improve participation in areas where weak
- need to demonstrate the 'value' of climate services
- differences between 'useful', 'usable' and 'being used' the latter is what we hope for by the end of the project
- we will use a range of methods & approaches (e.g., newsletters, briefing notes, other web-based material)

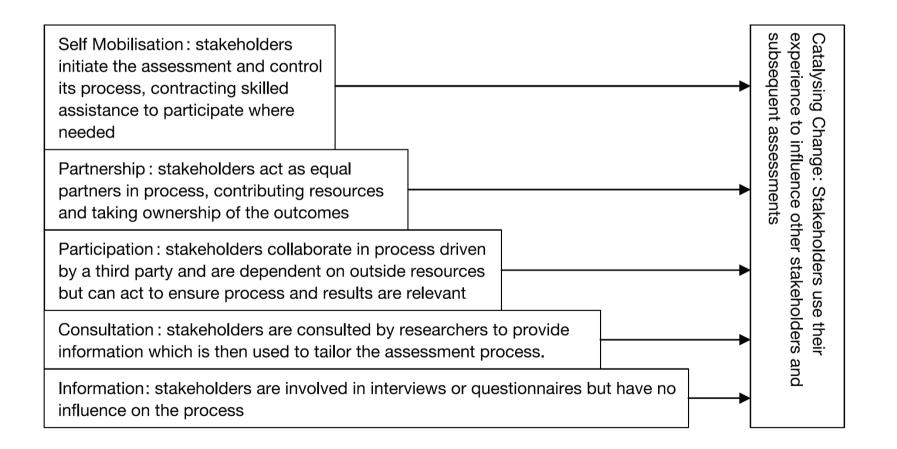
Scientific challenges:

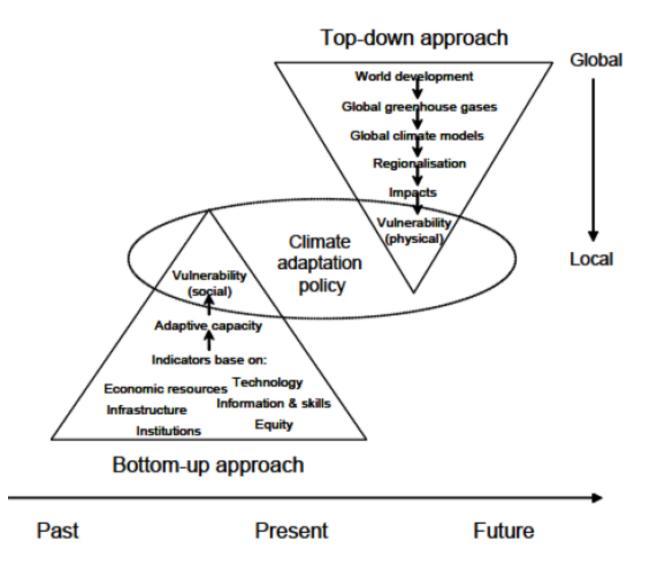
providing robust & reliable material at appropriate scales
covering the diverse needs across sectors/case studies
communicating/representing uncertainty

The CET and SET: Aris Bonanos, Philip Bourdeau, Čedo Branković, Adriana Bruggeman, Sandro Calmanti, Adeline Cauchy, Jean Chapoutot, Katarina Charalambous, Melanie Davis, Paco Doblas-Reyes, Clotilde Dubois, Christos Giannakopoulos, Valentina Giannini, Filippo Giorgi, Clare Goodess, Silvio Gualdi, Panos Hadjinicolaou, Maria Hatzaki, Latifa Henia, Manfred Lange, Robert Pasicko, Anagyrous Roussos, Paolo Ruti, Peter Schmidt, Samuel Somot

Ladder of stakeholder participation

(from Carter et al. '07, based on Pretty et al. '95 and Conde & Lonsdale '05)





Approaches to climate adaptation, Dessai and Hulme, 2004



- Global Framework for Climate Services
 - GFCS Climate Dialogue 26/27 October
 - WMO Extraordinary Congress 29-31 October
 - Priority areas: agriculture & food security, disaster risk reduction, health, & water

• One of the GFCS 8 principles is that it should be built through partnerships:

- -Climate Services Partnership
 - A platform for knowledge sharing & collaboration to advance climate service capabilities worldwide
 - CLIM-RUN is a CSP case study





- International Conference on Climate Services
 - ICCS-1, New York October 2011 http://iccs.iri.columbia.edu/
 - ICCS-2, Belgium September 2012 http://iccs2.iri.columbia.edu/
 - ICCS-3, Jamaica 2013
- European climate service activities
 - Meetings May 2012 Hamburg & September 2012 Brussels
 - Proposed European association (providers and users)
 - Sessions at EGU and EMS/ECAC
- European projects (2011-2014)
 - CLIM-RUN http://www.climrun.eu
 - ECLISE http://www.eclise-project.eu/

Climate Services

Examples and ongoing dialogues

- The NOAA Climate Service <u>http://www.climate.gov/#climateWatch</u>
- The Climate Service Center (CSC) Germany <u>http://www.climate-service-center.de/</u>
- South African Climate Information Portal <u>http://cip.csag.uct.ac.za/</u>
- Regional climate services workshop 2011, BC <u>http://pacificclimate.org/news-and-events/regional-climate-services-workshop-2011</u>
- CIRCLE-2 and JPI Climate scoping workshop on climate services development in Europe <u>http://www.circle-era.eu/np4/459.html</u>
- JPI Climate Module 2 Researching climate service development and deployment <u>http://www.jpi-climate.eu</u>
- - http://www.ukcip.org.uk/wordpress/wp-content/PDFs/UKCP09-userengagement.pdf and
 - http://www.ukcip.org.uk/wordpress/wp-content/CSS/CSS-workshop-



VENTH FRAME

Some issues and questions in climate services

- Distinctions between data, products, information, knowledge
- Importance of presentation, access, user-friendliness
- Information about past/current climate variability is very important
- Value of guidance and case studies how to use/not use information, FAQs
- Distinctions between what is useful, usable/actionable, and actually used
- When is information useful/relevant? salient, credible, legitimate.....
- Balancing user needs/usability and scientific advancement/credibility
- How to assess value of climate services? eg., economic valuation
- Why/what do providers need to know about users?
 - different types of users with different capabilities (impacts to policy, sectors)
 - context and framing are very important (climate change, organisation, risk)
 - climate change is never the only issue! (the decision-making context)
 - basis for building sustained engagement
- Balancing supply and demand
- Generic vs bespoke climate services (diversity of user needs)
- Funding and sustainability business models and markets
- Training the providers (accreditation?)

Thank you!