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GROWTH VS CLIMATE

Hotel Exe Campus, Universitat Autònoma de Barcelona

Dragana Bojović*, Sam Pickard *, Mar Santamaria * *
Pablo Martínez * *, Eulàlia Baulenas *

* Barcelona Supercomputing Center | Earth Sciences Department | Knowledge Integration Team

* * 300K

Coproducing climate services for near-term urban climate adaptation: supporting resilience to heat in Barcelona

Barcelona Supercomputing Center
Centro Nacional de Supercomputación

ICTA Institut de Ciència i Tecnologia Ambientals ICTA-UAB

UAB Universitat Autònoma de Barcelona

EXCELENCIA MARÍA DE MAEZTU

Climate Services – the paradigm

- Climate services involve the production, translation, transfer, and use of climate knowledge and information in climate-informed decision making and climate-smart policy and planning (Climate Services Partnership)
- Central aspects common to these definitions are the provision of climate information/data/tools that supports user needs through engagement with the users of the services (Bruno Soares and Buontemo, 2019)

This project has received funding from the European Union's Horizon Europe research and innovation programme under grant agreement No 101081555

Moving from a binary/polarized to inclusive approach

- To transform society we need to shift from the ‘
  perspective, acknowledging the entanglements
  connectedness and our shared reality (O’Brien
- ➢ Transdisciplinarity, knowledge coproduction an
  knowledge networks
- Coproduction is “a complex meeting place where
  academic traditions and **practices** converge, o
  other, come into conflict, or cooperate” *Bremer a*

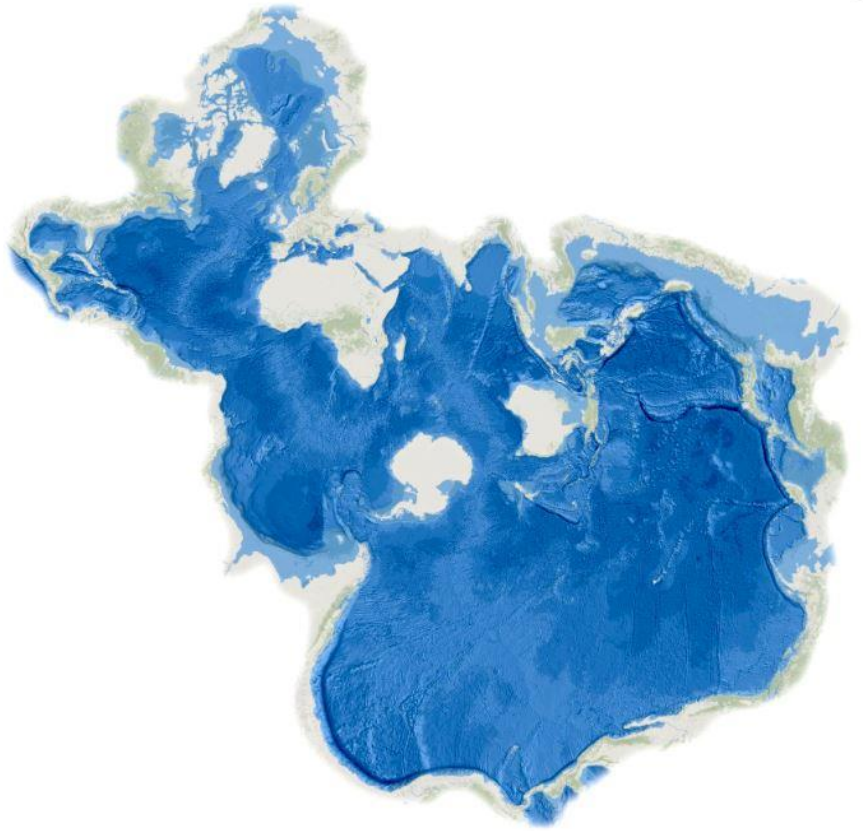
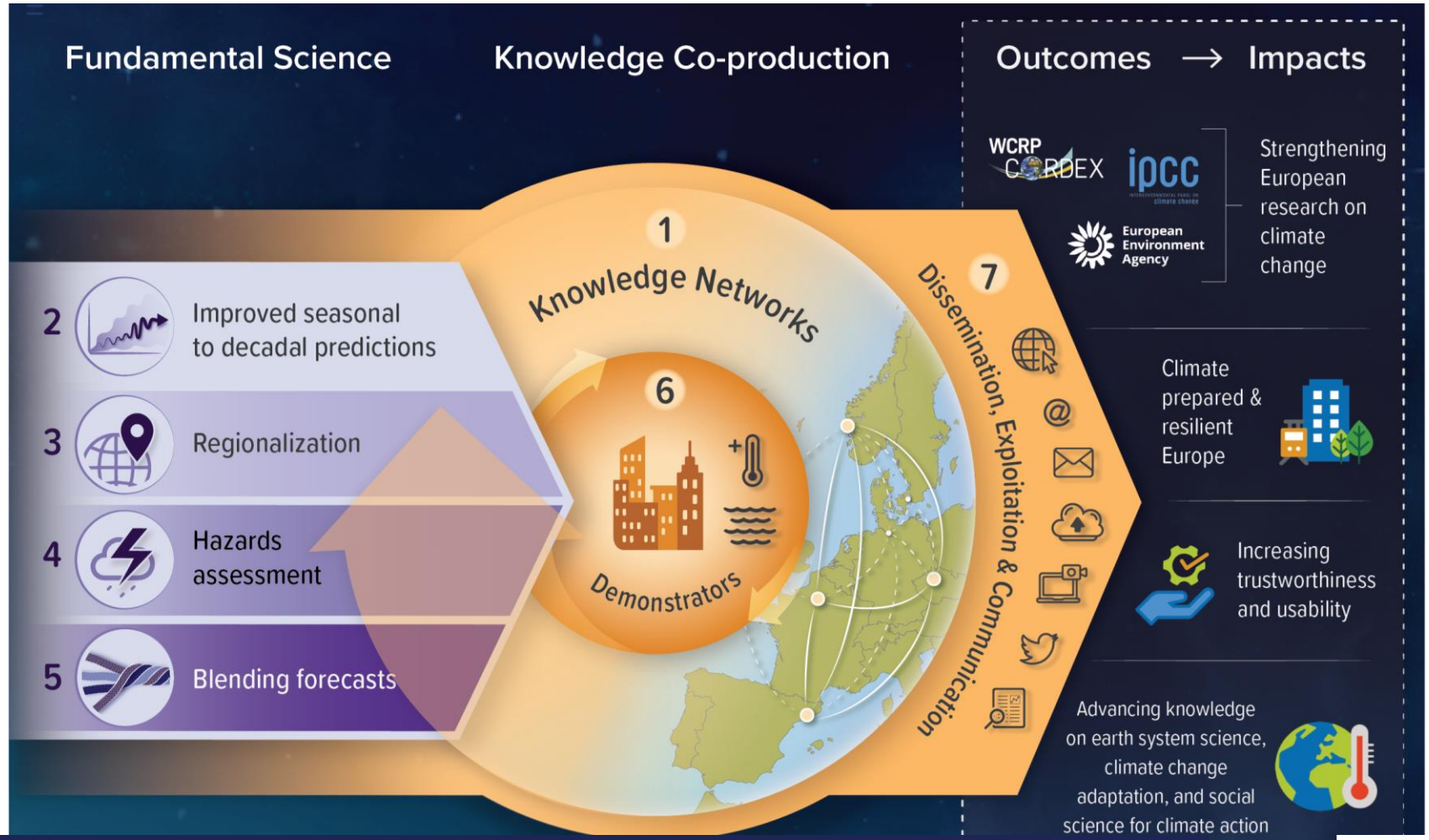


Image credits: John M Nelson

Impetus4Change *(Improving near-term climate predictions for societal transformation)*



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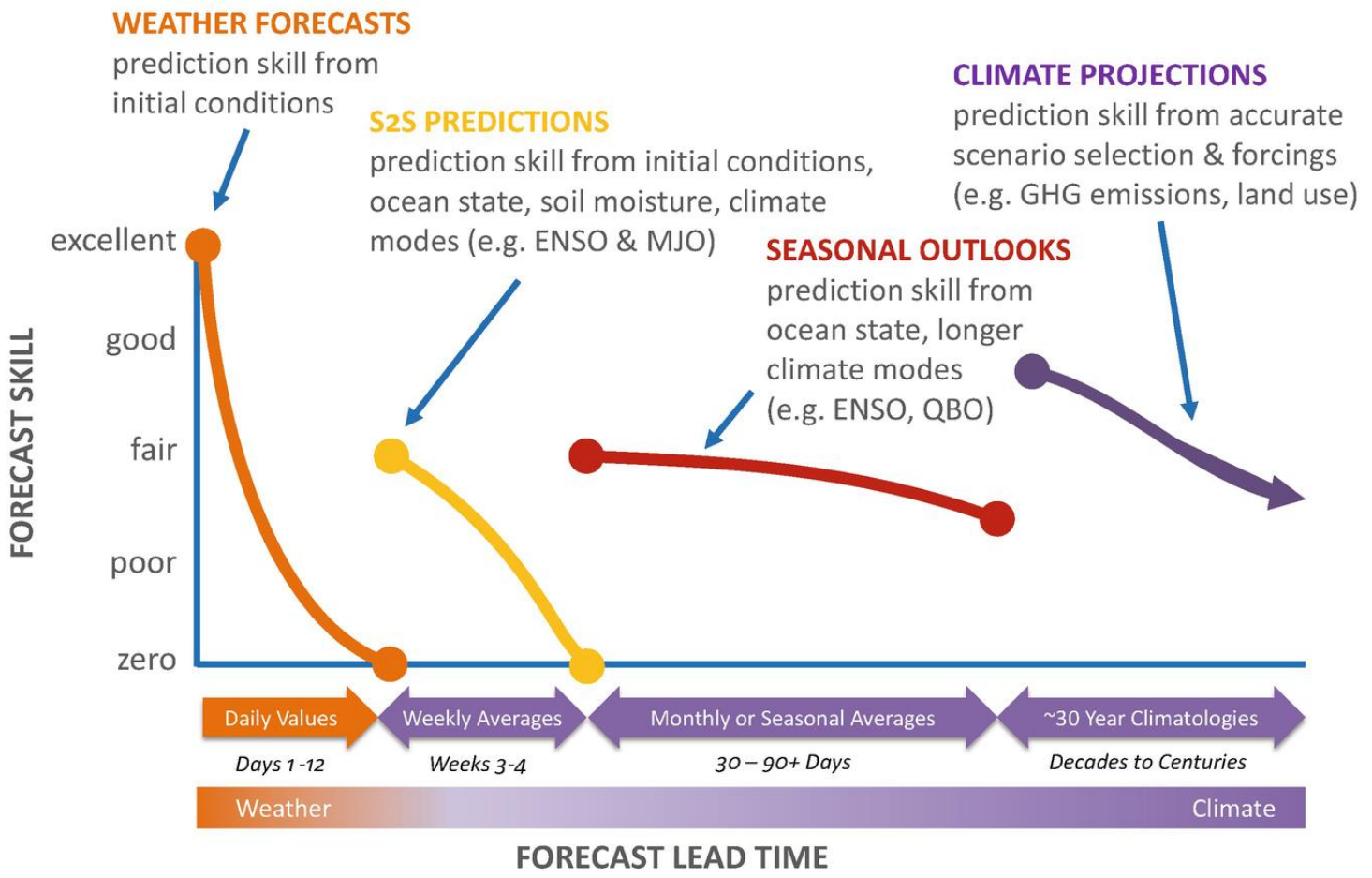
Prediction Types, Skill, and Lead Times



Adapted from iri.columbia.edu/news/qa-subseasonal-prediction-project

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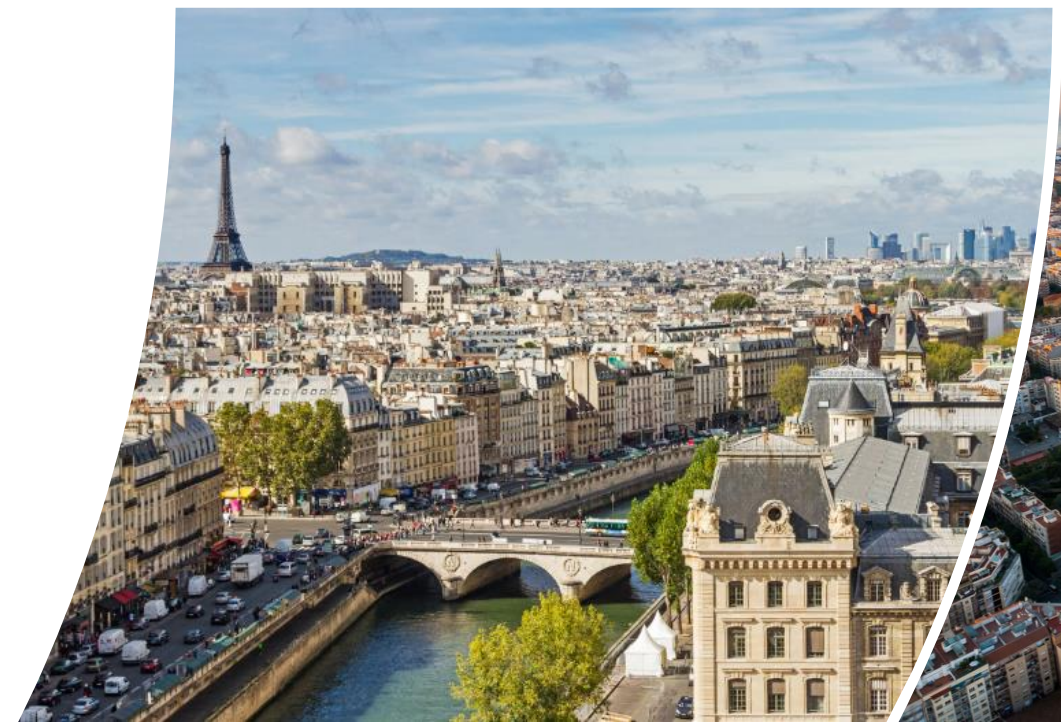
Coproduction of I4C Demonstrators cities



The Barcelona Demonstrator

Image Source: DOI:10.1088/1757-899X/753/2/022048, License CC BY 3.0

Tools&practices designed to facilitate transdisciplinarity in Impetus4Change:

1) The coproduction framework – guiding the activities
2) Purposeful and structured stakeholder mapping and user selection
3) Co-exploration and co-design of climate service mock-ups in transdisciplinary hackathon-like events
4) Iterative development of a catalogue of services
5) Co-creation of a climate service co-evaluation framework tailored to local contexts

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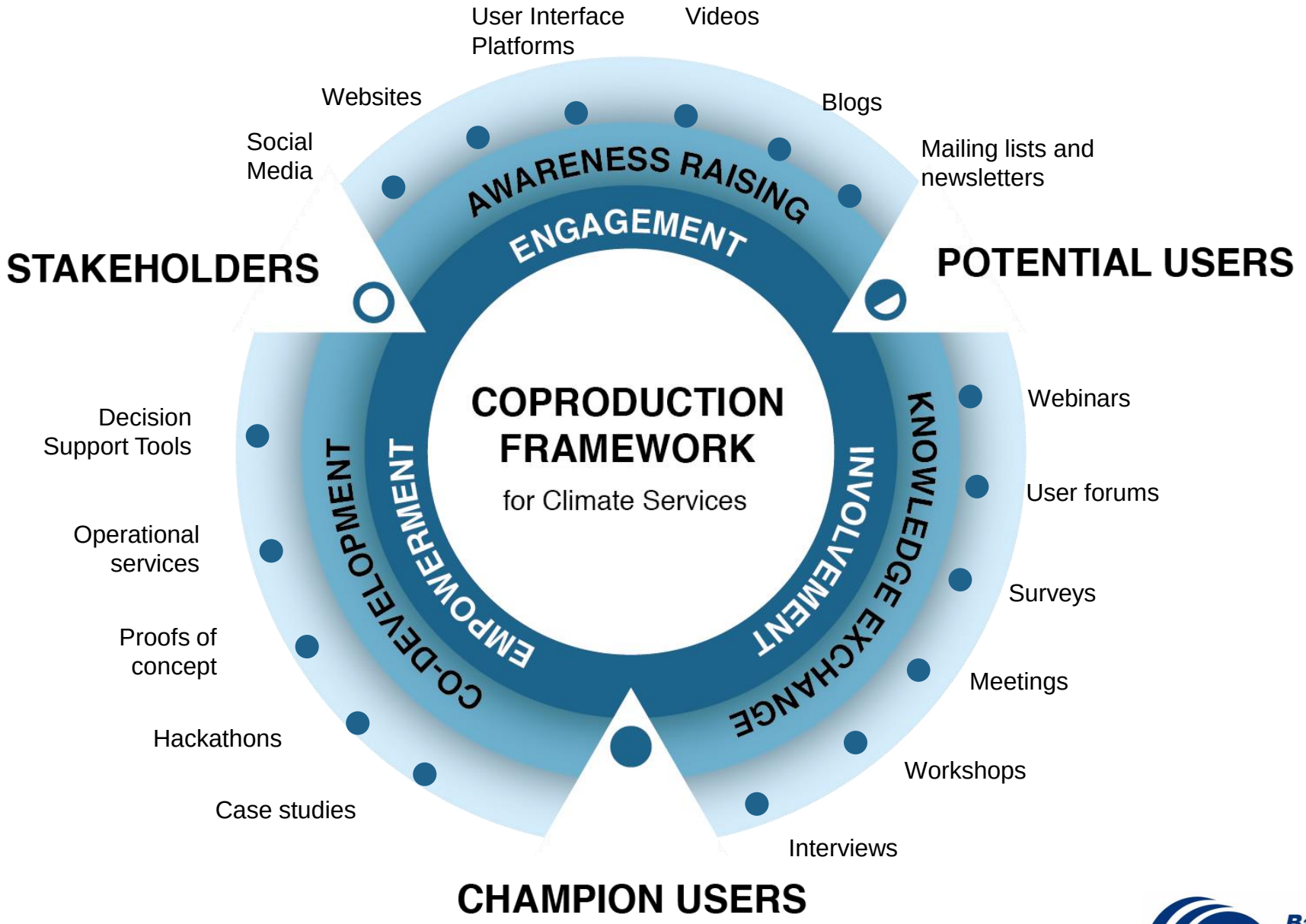

Bojovic, D. et al. (2021). Engagement, involvement and empowerment:
Three realms of a coproduction framework for climate services. *Global Environmental Change*, *68*

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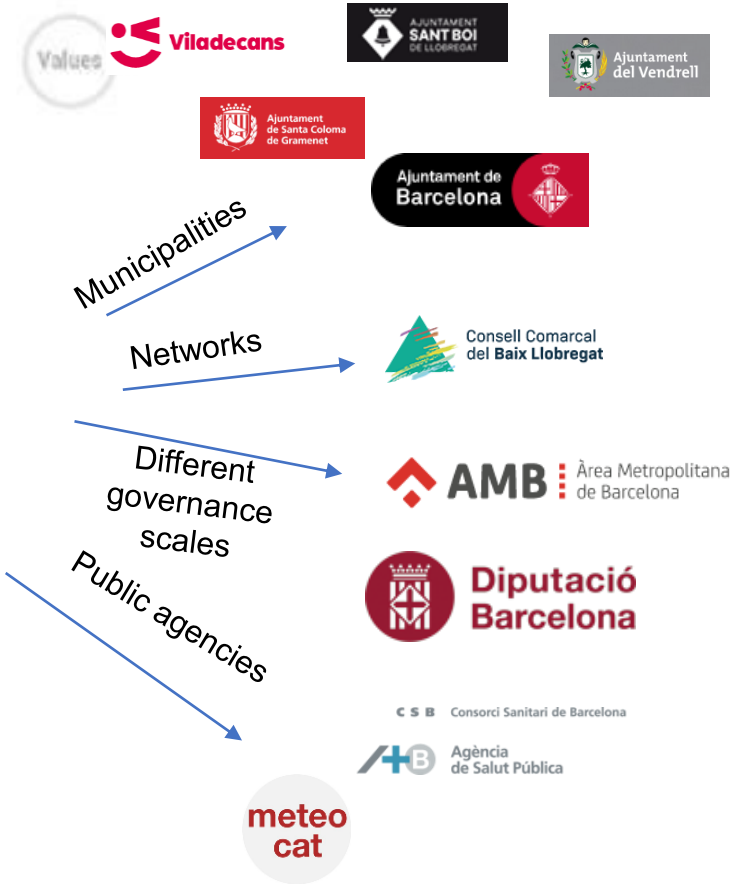
Stakeholder mapping and co-exploration



What high-level goal conceptualization

Where defining the case

Whom to include in the user selection

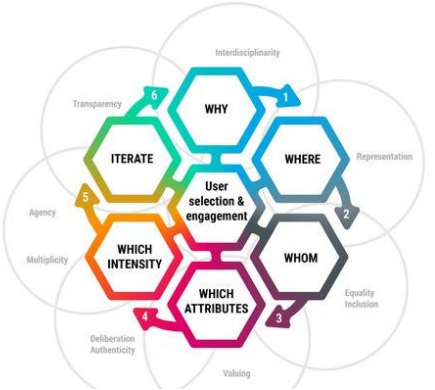
WHY criteria for engaging which stakeholders

Which intensity defining engagement intensity

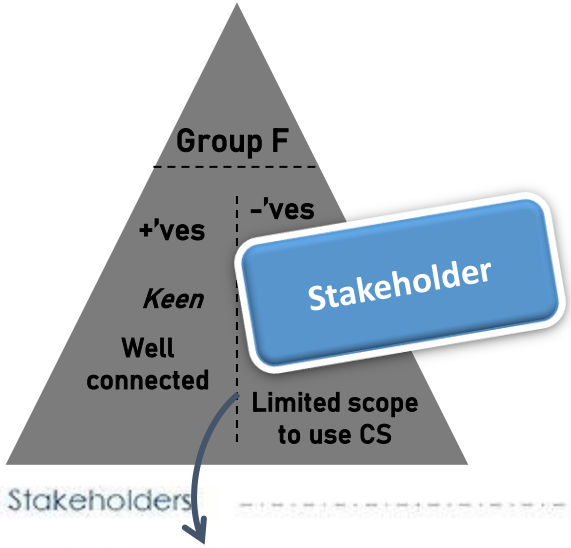
How iterate, adding the co- component to each step with the users

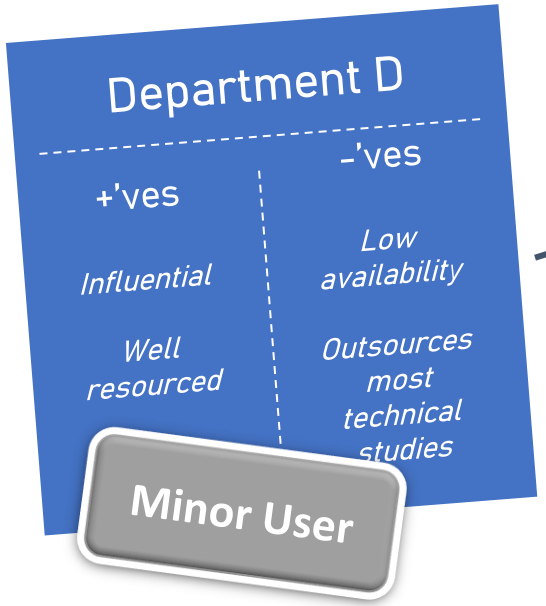
Baulenas et al. (2023) User Selection and Engagement for Climate Services Coproduction. *Weather, Climate and Society 15*

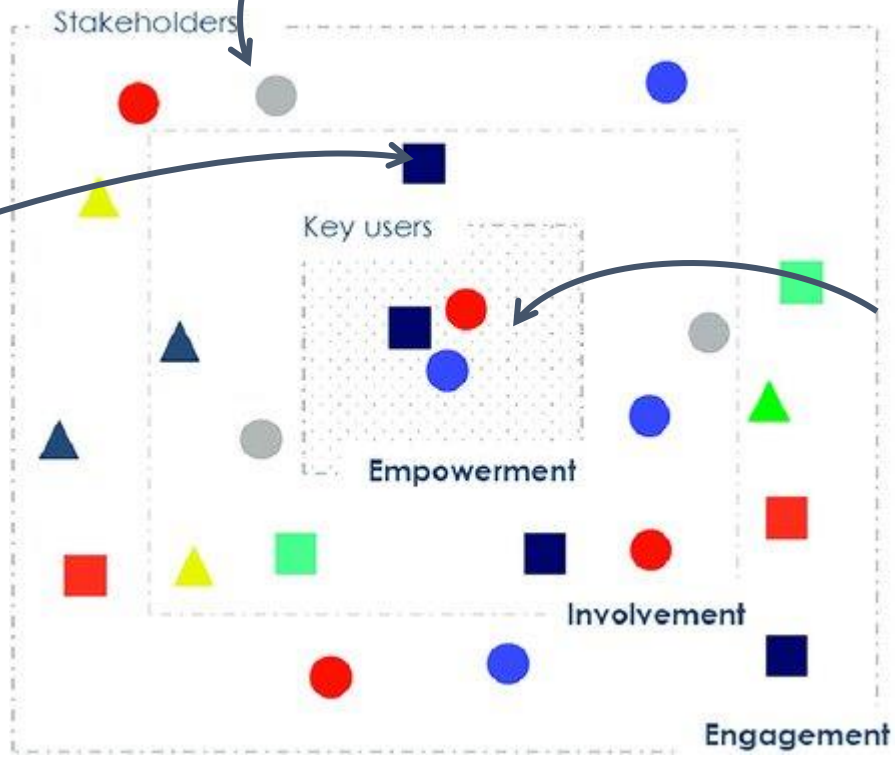
IMPETUS 4CHANGE

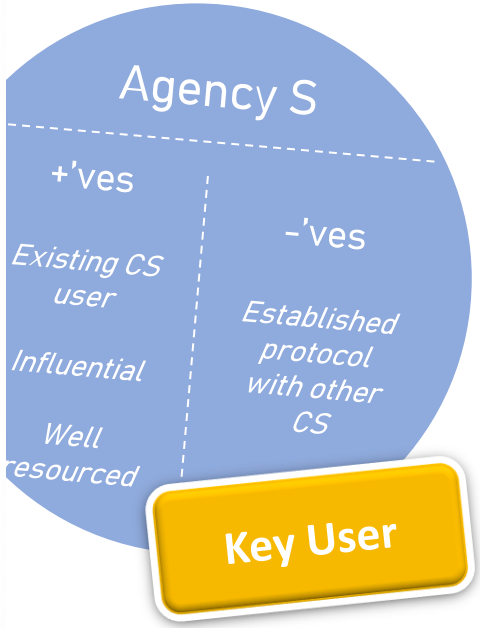


3 – Whom?
4 – Which attribute?
5 – Which intensity?









Co-design in Adaptalabs

Co-creation: Catalogue of services

- Stakeholder engagement
- Diaries of the stakeholder engagement – to learn across the demonstrator cities
- Catalogue of climate services – to transparently link climate science capabilities with real world urban stakeholders' demands

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A deeper understanding of heat (1 of 2)

Climate information that provides a more holistic understanding of how urban heat will be affected by the combination of climate change and climate variation.

What could we collaborate on?

Supporting decisions at different timescales, and integrating with impact models (beyond I4C), for example:

- How to prepare for heat (logistics, protocols, early warnings etc.)
- How to intervene to limit heat exposure (urban shading, reflective surfaces etc.)
- Where to go to escape the heat (cooler parts of the city and climate shelters)
- Creating heat–health vulnerability maps
- Using urban (re)design to combat UHI
- Mapping safe(r) spaces (e.g. combining with air pollution)

	What can I4C offer?			
Climate Info Availability & Skill	Historical - Weather	Near-future (weeks - months)	Future (months - years)	Projections (years - decades)
Extreme temperatures				
# heatwaves (Day/Night time)				
HW severity (intensity / duration)				
Thermal comfort			?	?

A deeper understanding of heat (2 of 2)

Climate information that provides a more holistic understanding of how urban heat will be affected by the combination of climate change and climate variation.

What do we need from you?

Some examples:

- Important thresholds (e.g. day time / night time temperatures and humidity levels that trigger protocols)
- Implementation dates (e.g. when climate shelters are operational, when time-shifting is permitted, when are streets resurfaced)
- Decision dates when implementation actions are decided (and reviewed)
- Input requirements for impact models

Who is this for?

Collaborators interested in, or responsible, for:

- Urban planning
- Public (environmental) health
- Housing
- Economic activity
- Energy poverty

What else could it lead to/interact with?

Example impact models and complementary data/information:

- High-resolution thermal mapping (e.g. street scale or UHI)
- Scenario testing for resilience interventions (green spaces, climate refugees etc.)
- Identifying at-risk locations (elderly residences, hospitals, schools, low-quality housing, tourist hubs etc.)
- Mortality/morbidity/well-being models

Urban greening: parks, gardens, trees (1 of 2)

IMPETUS 4CHANGE

Climate information that supports efforts to increase the coverage and resilience of urban green spaces

What could we collaborate on?

Supporting decisions at different timescales, and integrating with impact models (beyond I4C), for example:

- When to plant new trees?
- Where / when are future drought risks?
- How climate-compatible are existing & planned green spaces?
- What are future irrigation requirements?
- How can green spaces contribute to urban cooling / impacted by UHI?
- How will biodiversity be impacted in the future?

What can I4C offer?

Climate Info Availability & Skill	Historical - Weather	Near-future (weeks - months)	Future (months - years)	Projections (years - decades)
Temperatures (max/min/av.)				
Dry spells (# & duration)				
Precipitation				
Drought index				

Co- development: Catalogue of climate services

Forest fires (1 of 2)

Climate information to complement existing forecast systems with advance warning of the likelihood of forest fires and compound hazards (e.g. droughts or heat waves)

What could we collaborate on?

Supporting decisions at different timescales, and integrating with impact models (beyond I4C), for example:

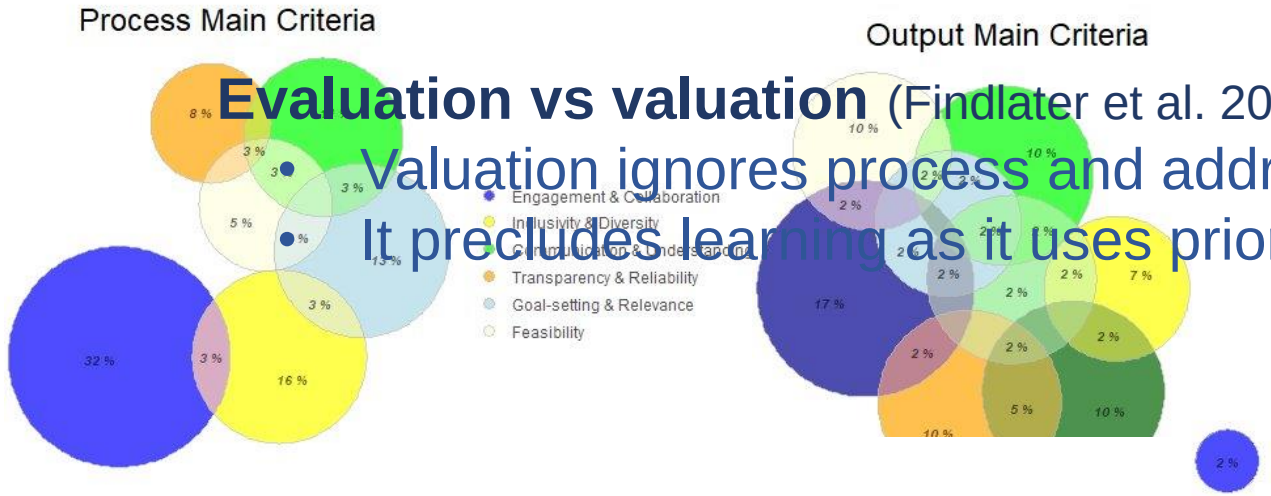
- Early (earlier) warning systems
- Prioritisation interventions to limit exposure to or impact from forest fires
- Impact of forest fires (e.g., if combined with fuel source mapping)
- Likelihood and impact of compound events
- Air pollution impacts

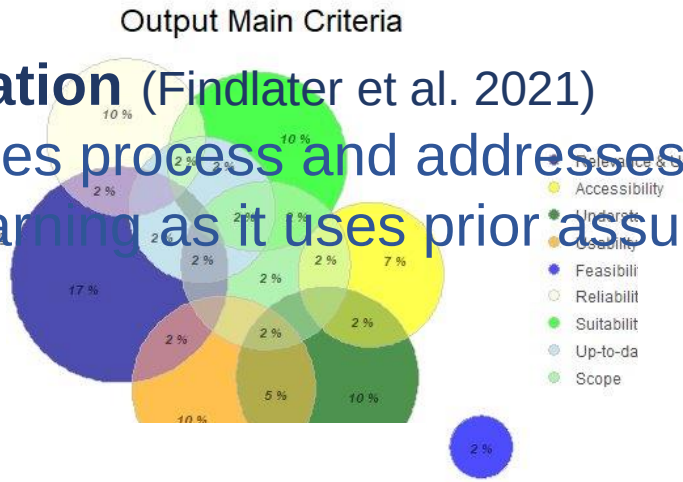
What can I4C offer?				
Climate Info Availability & Skill	Historical	Near-future (weeks to months)	Future (months to years)	Projections (decades)
Fire weather index			NA?	NA?
Drought			?	?
Dry days / dry spells				
Temperature / Heat Waves				

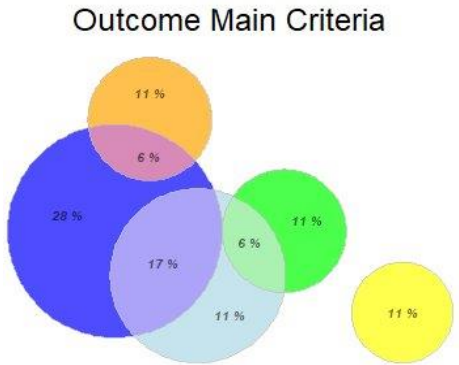
Co-evaluation

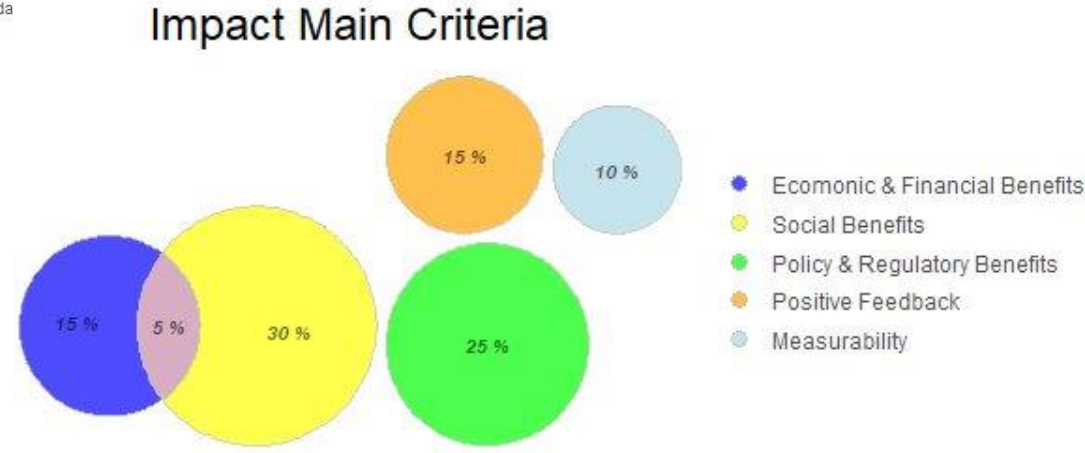
Evaluation vs valuation (Findlater et al. 2021)

- Valuation ignores process and addresses only quantifiable outcomes
- It precludes learning as it uses prior assumptions









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Conclusions

- Genuine interdisciplinary collaboration is prerequisite for transdisciplinarity
- Coproduction processes should start with the problem co-exploration
- Careful stakeholder mapping and engagement addresses the “usual suspect” and “mini-me” phenomena in climate services
- Climate services can include a range of tailored information, services and new knowledge

➢ The coproduction processes in each demonstrator have progressed in different ways, building on the prior strength of the network and the mutual support between different scientific and practitioner disciplines.

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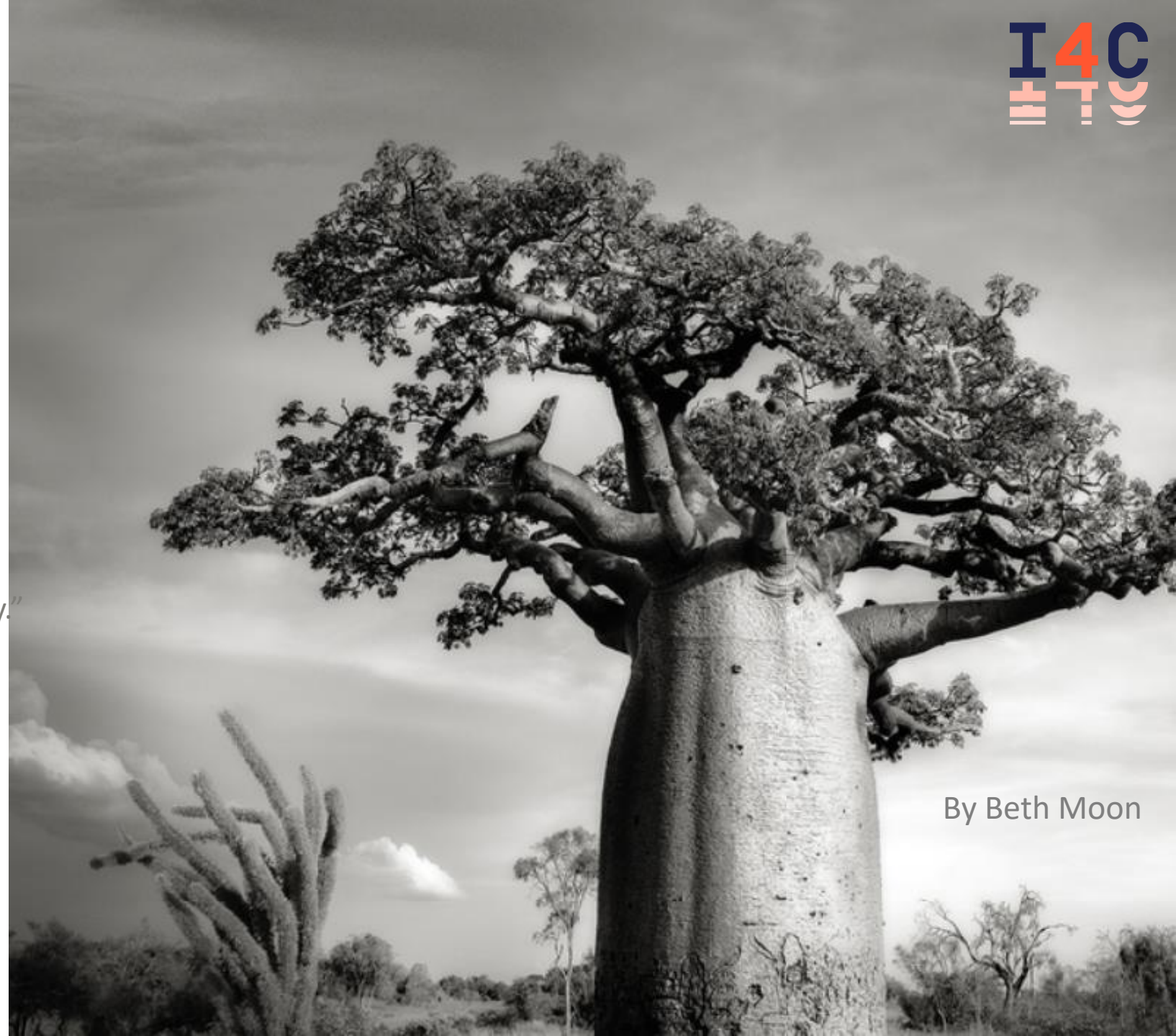
“One of the most profound aspects of climate change, and environmental change in general, is that more people are beginning to consciously perceive themselves to be part of a larger system. When we perceive of ourselves as entangled quantum systems and recognize consciousness and free will as inherent within our being, we can choose to relate differently to ourselves, each other, the environment, and the future. Yet an equitable and thriving world will not just “happen”…we may need a different way of “being in action”, including a different understanding of individual and collective agency.”

Karen O’Brien: You matter more than you think, p. 86



By Beth Moon

Barcelona Supercomputing Center
Centro Nacional de Supercomputación

ICTA
Institut de Ciència
i Tecnologia Ambientals
ICTA-UAB

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https://www.growthvsclimate2024.org

300.000 Km/s
trescientosmil

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