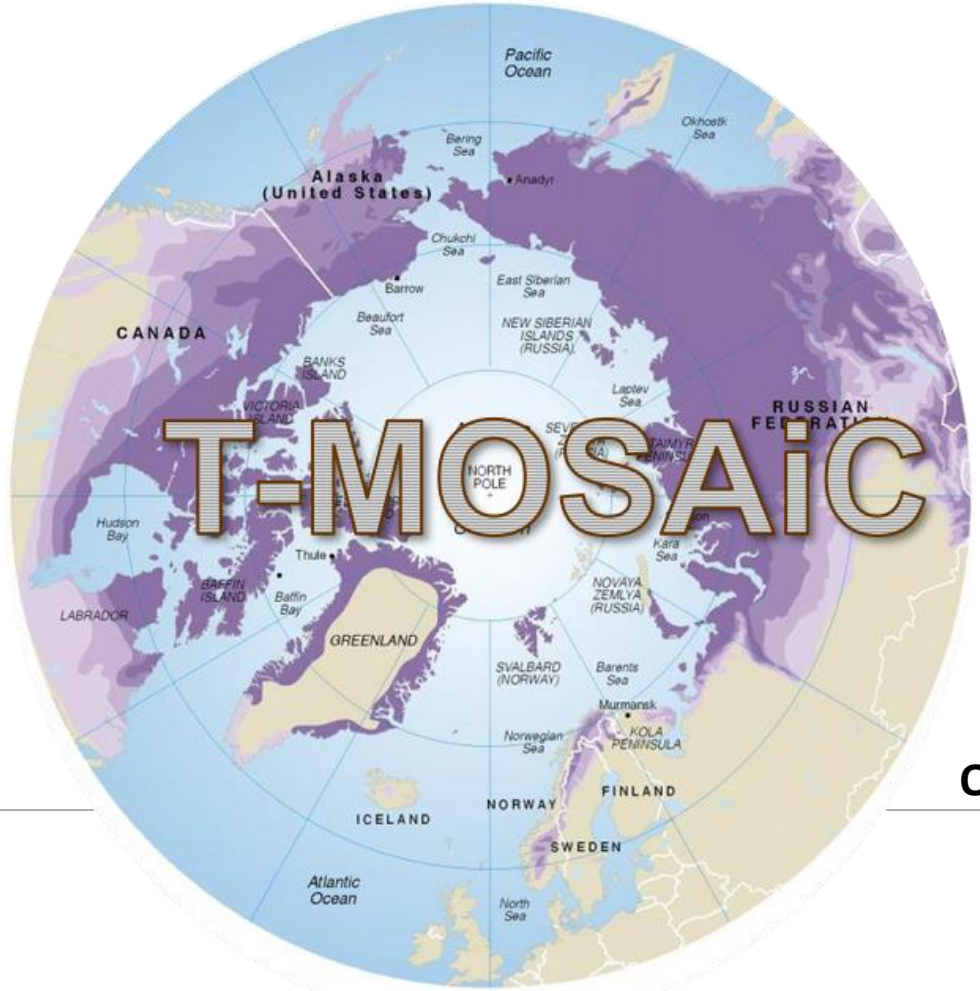
IASC



T-MOSAiC

Quebec City, December 11th, 2017

FCT Fundação para a Ciência e a Tecnologia

CENTRE D'ÉTUDES NORDIQUES
CEN Centre for Northern Studies

UNIVERSITÉ LAVAL

TÉCNICO LISBOA

INTER=ACT

Sentinel North

NUNATARYUK

APECS Association of Polar Early Career Scientists

PYRN Permafrost Young Researchers Network

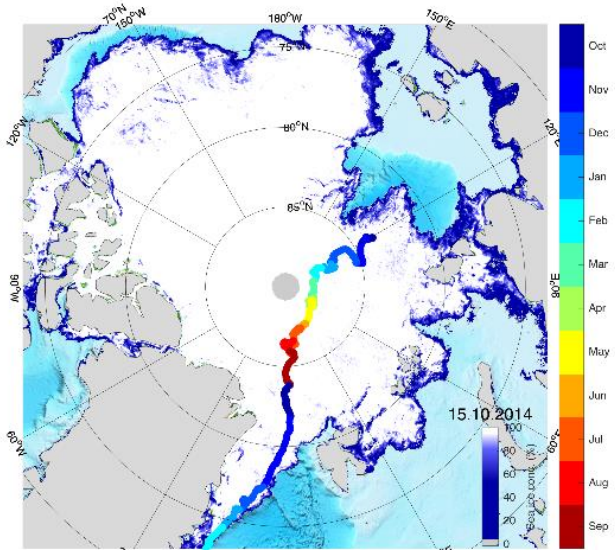
MOSAiC

A major international research initiative under IASC to improve the representation of Arctic processes in weather forecast and climate models

MOSAiC

MOSAiC
The International Arctic Drift Expedition

2019-2020



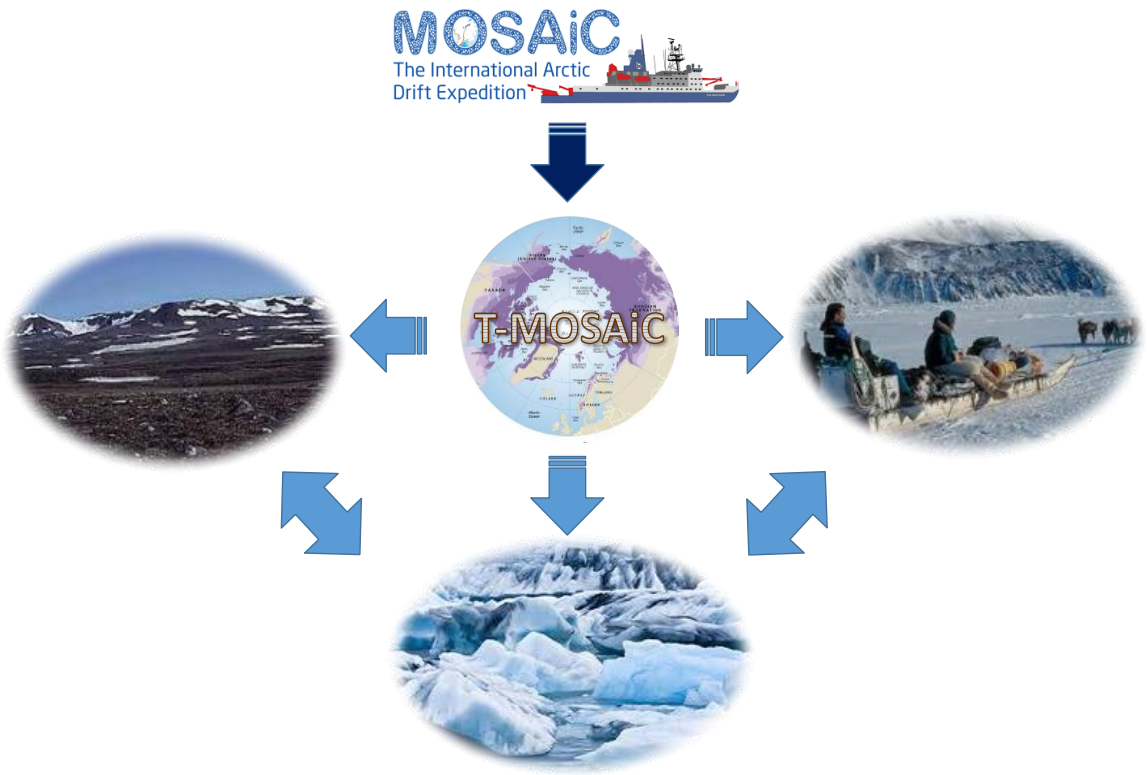
Additional icebreaker support (China)

Diverse (multidisciplinary) ship-based and ice camp observations

Fixed-wing aircraft surveys

Satellite remote-sensing

T-MOSAiC – discussions initiated by IASC



T-MOSAiC aims to coordinate complementary activities that could both aid and benefit from MOSAiC by extending the work to the lands surrounding the Arctic Ocean and to the northern communities who live on those lands

Themes of T-MOSAiC

Synthesis of environmental monitoring data from remote stations; measurements and models of permafrost, snow and glacier mass balance across different scales, and projections of the future state of the Arctic cryosphere.

Estimates of past changes in Arctic geodiversity and biodiversity in land and inland water systems, measurements of current states (e.g. via transects, drones) and change.

Estimates of how changing precipitation and temperature regimes are affecting ecosystem services such as drinking water and country foods, and geosystem services such as the permafrost foundation that underpins buildings and transport infrastructure.

T-MOSAiC Timeline

Arctic Change 2017

- Steering Committees
- General discussion of scientific questions and aims
- Definition of Science Plan
- Discussion of an implementation plan including funding

POLAR 2018

- Approval of the Science plan
- Final discussion of the implementation plan
- Update on funding strategies
- Final schedule

Quebec City workshop

hours 9:00 – 12:00 h

Steering Committee Meeting

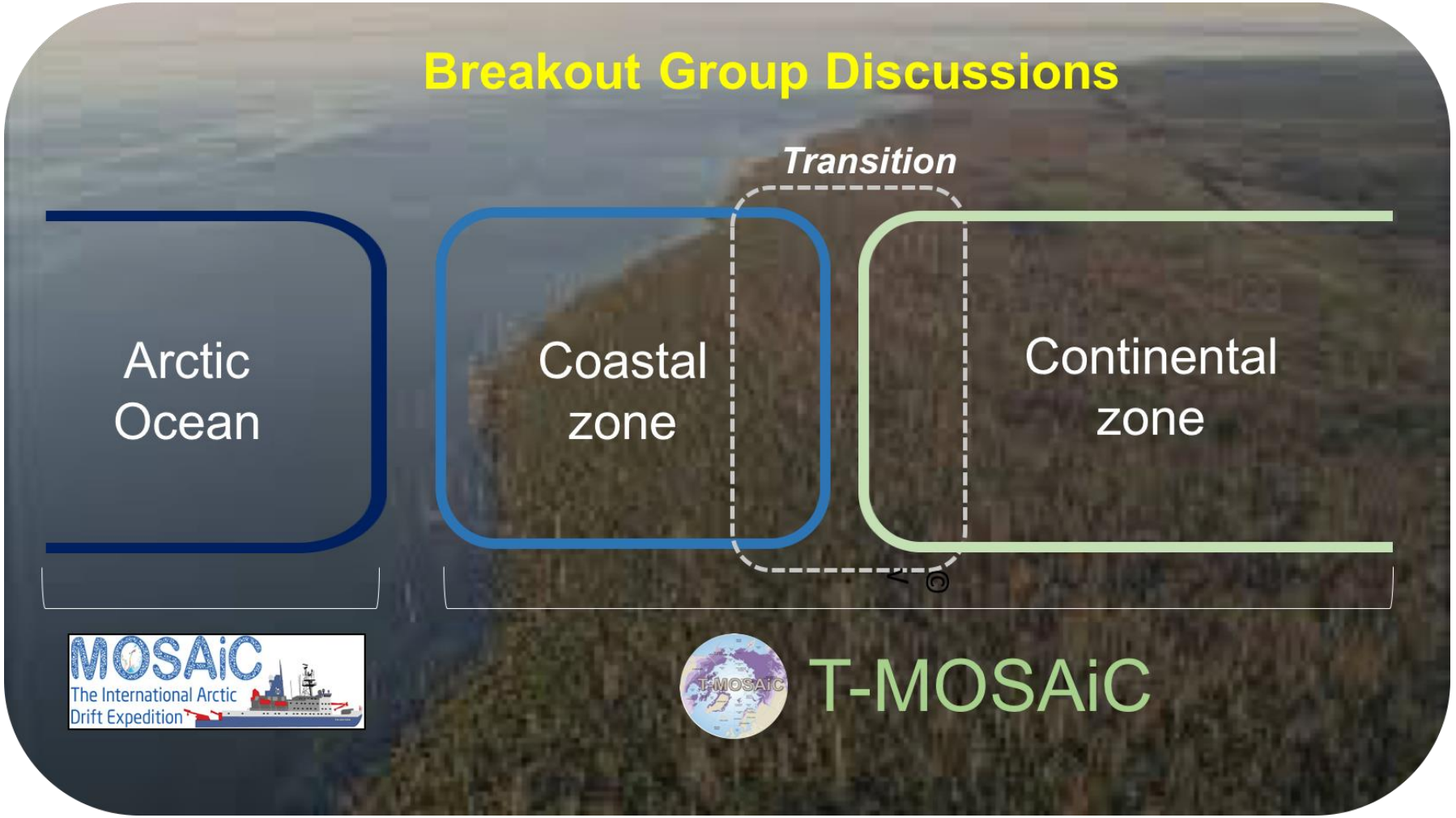
- Scientific questions and priorities
- Scientific goals
- Brief discussion of the implementation plan

hours 13:00 – 17:30 h

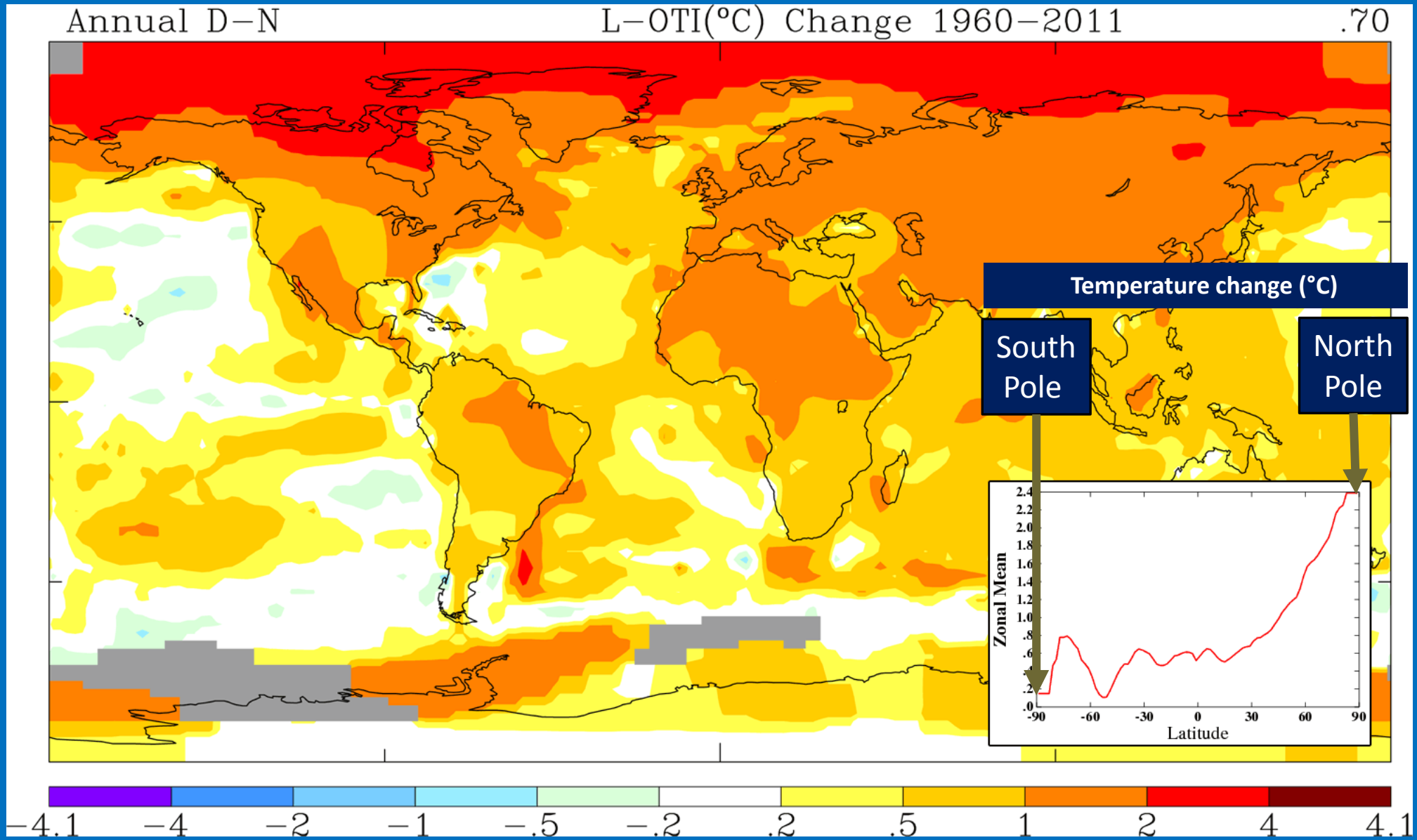
Open Meeting

- How can T-MOSAiC contribute to a better knowledge of the Arctic in transition?
- Which current Arctic programs could potentially contribute to T-MOSAiC?

Workshop summary - AM

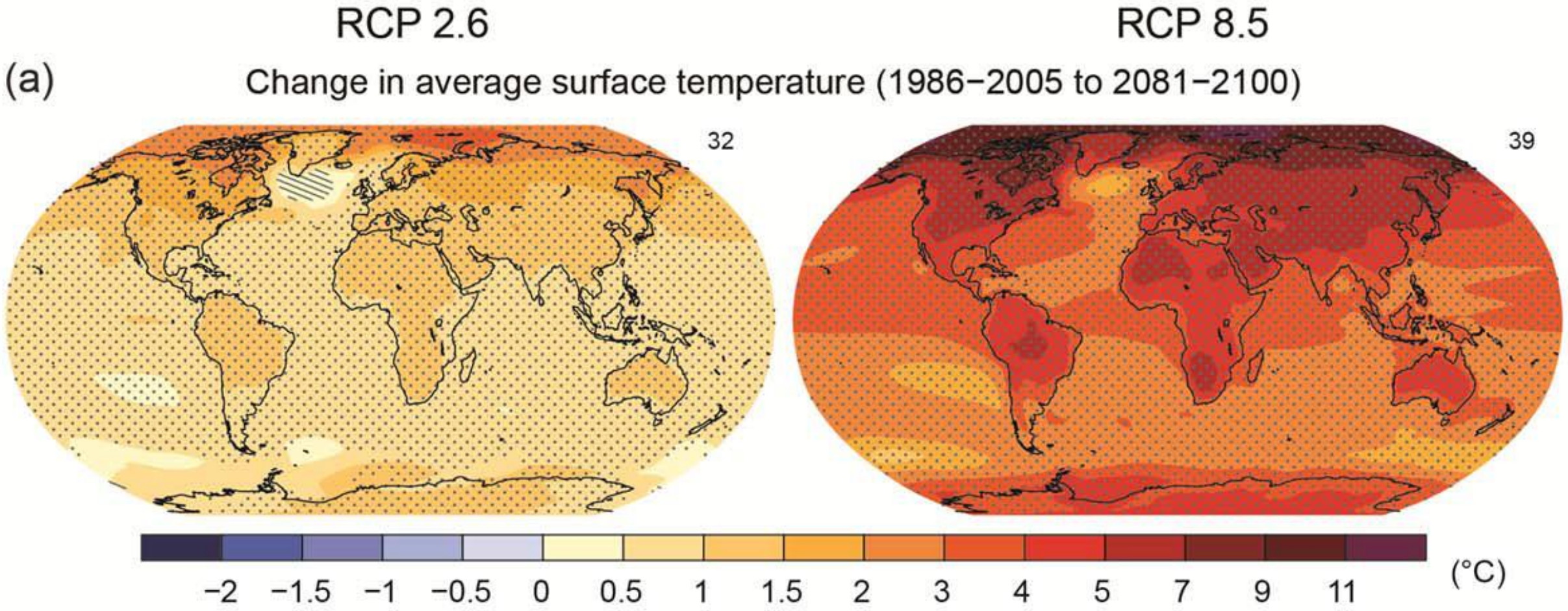


Rationale for T-MOSAiC: Arctic amplification



IPCC Report 2013 : Projections for 2100

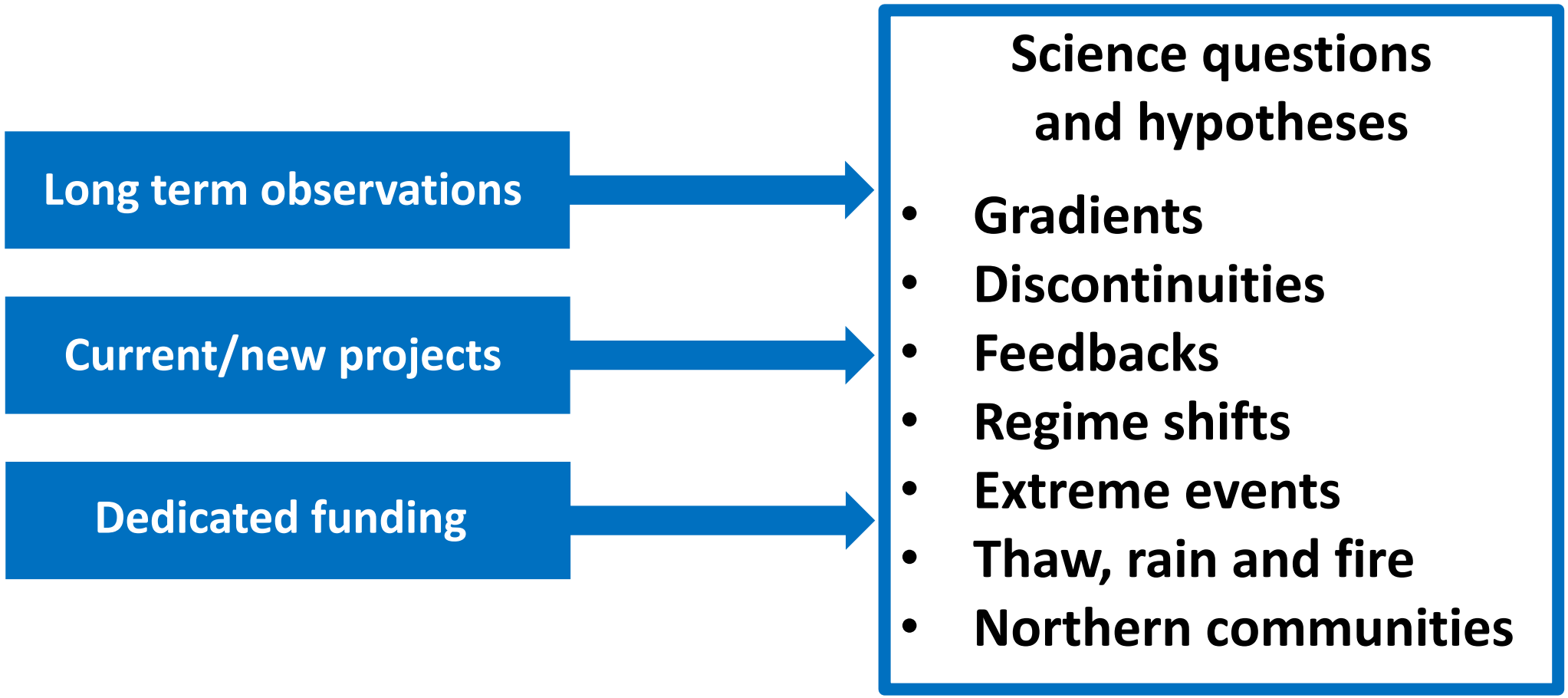
ARCTIC AMPLIFICATION



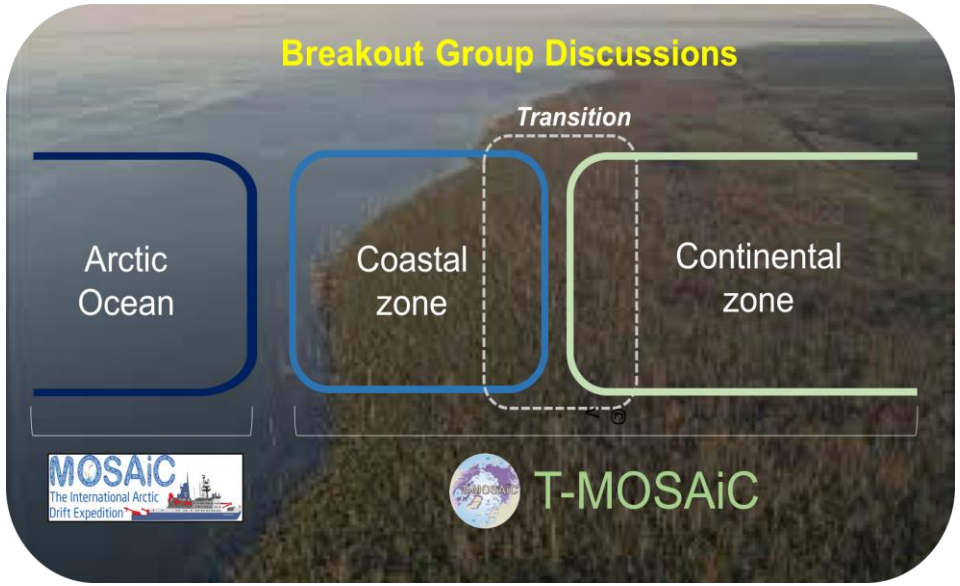
Elements of T-MOSAiC

- Catalyst and set of opportunities
  - improved understanding
  - focus of attention on the Arctic
  - circumpolar collaboration
- Framework
  - place old, current and new information in a broad context
  - address key scientific questions

Three pathways for T-MOSAiC



T-MOSAiC Hypotheses



- System properties in the 'coastal terrestrial zone' are influenced by Arctic Ocean sea-ice, climate and marine processes
- There are discontinuities in key system properties in the 'transition zone' to the 'continental zone'
- These discontinuities are vulnerable to displacement and regime change
- There are strong north-south gradients of system properties in the continental interior
- These are also affected by the changing Arctic Ocean and associated climate dynamics

T-MOSAiC deliverables

*The **APECS steering group** underscored the vital importance of data management in T-MOSAiC

Science questions and hypotheses

- Gradients
- Discontinuities
- Feedbacks
- Regime shifts
- Extreme events
- Thaw, rain and fire
- Northern communities

Outputs

- Snapshots
- Data sets*
- Samples
- Syntheses
- Models
- Processes

Next steps:

- Opening of Secretariat in Lisbon (2018-2023)
- Ongoing discussions including re. data
- T-MOSAiC Science Plan IASC Workshop at Davos, 20 June 2018
- IASC workshop in Ottawa (Dec 2018)
- T-MOSAiC operations workshop at ASSW Arkhangelsk (2019)

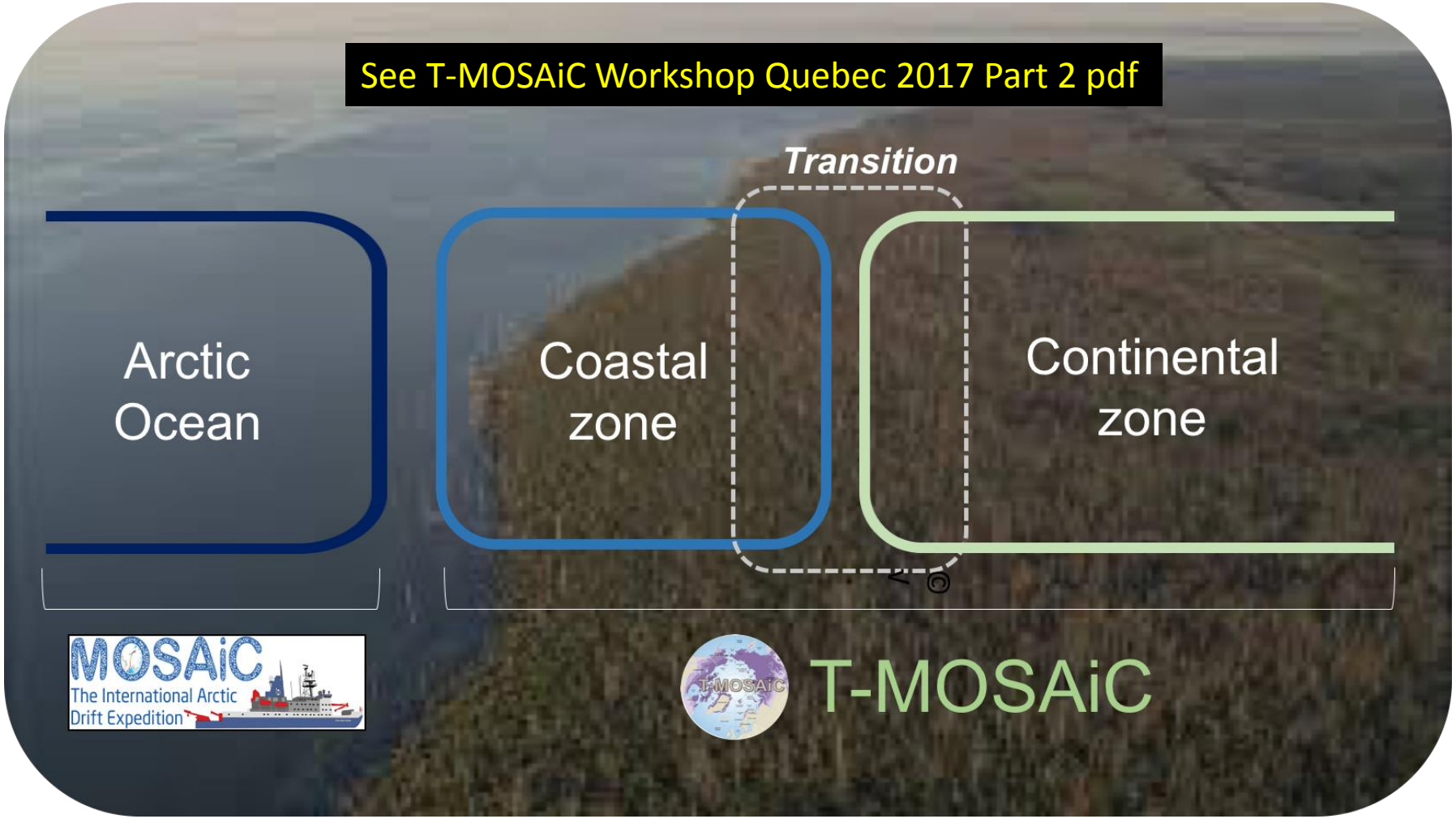
T-MOSAiC

Steering committee

- João Canário (chair), *Instituto Superior Técnico – University of Lisbon, Portugal*
- Warwick F. Vincent (co-chair), *Centre for Northern Studies (CEN) – Laval University, Canada*
- Gail Fondahl , *University of Northern British Columbia, Canada*
- Gonçalo Vieira, *IGOT – University of Lisbon, Portugal*
- Greg Henry, *University of British Columbia, Canada*
- Hugues Lantuit , *Alfred Wegener Institute (AWI), Potsdam, Germany*
- Ingibjörg Svala Jónsdóttir, *University of Iceland, Iceland*
- James Drummond, *Dalhousie University, Canada*
- Josef Elster, *University of South Bohemia, Czech Republic*
- Julia Boike , *Alfred Wegener Institute (AWI), Potsdam, Germany*
- Margareta Johansson, *INTERACT, Sweden*
- Marie-José Naud, *CEN/UQAR, Canada*
- Phil Wookey, *University of Sterling, United Kingdom*
- Sergey N. Kirpotin, *National Research Tomsk State University, Russia*
- Vladimir Romanovsy, *University of Alaska – Fairbanks, USA*
- Taneil Uttal, *NOAA, Boulder, Colorado, USA*
- Ulrike Herzschuh , *Alfred Wegener Institute (AWI), Potsdam, Germany*
- Yoo Kyung Lee, *Korea Polar Research Institute (KOPRI), South Korea*

T-MOSAiC

Steering committee – APECS group

- Gerlis Fugmann, *APECS International*
- Alice Bradley, *University of Colorado, Boulder, USA*
- Aletvina Evgrafova , *IASC TWG Fellow, Switzerland*
- Jean Holloway, *University of Ottawa, Canada*
- Mélanie Jean, *Northern Arizona University, USA*
- Michel Paquette, *University of Montreal, Canada*
- Pedro Freitas, *IGOT – University of Lisbon, Portugal*
- Scott Zolkos, *IASC TWG Fellow, Canada*

T-MOSAiC Presentations – Summary slides (PM)