Quebec City, December 11th, 2017
A major international research initiative under IASC to improve the representation of Arctic processes in weather forecast and climate models
MOSAiC

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

Steering Committees

General discussion of scientific questions and aims

Definition of Science Plan

Discussion of an implementation plan including funding

Approval of the Science plan

Final discussion of the implementation plan

Update on funding strategies

Final schedule
Quebec City workshop

9:00 – 12:00 h
Steering Committee Meeting
- Scientific questions and priorities
- Scientific goals
- Brief discussion of the implementation plan

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

Breakout Group Discussions

Arctic Ocean

Coastal zone

Continental zone

T-MOSAiC
Rationale for T-MOSAiC: Arctic amplification
IPCC Report 2013: Projections for 2100

ARCTIC AMPLIFICATION

RCP 2.6

Change in average surface temperature (1986–2005 to 2081–2100)

RCP 8.5

°C
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

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

Long term observations

Current/new projects

Dedicated funding
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

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

*The APECS steering group underscored the vital importance of data management in T-MOSAiC
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 Romanovsky, 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
See T-MOSAiC Workshop Quebec 2017 Part 2 pdf