

CLIMSLIP Meeting - Issues

- Campaign data analysis – modelling plans
- YAK campaign planning, data analysis (methane)
- Aerosol case studies (spring/summer), calc. heating rates?
- Ozone – data analysis (P'CAT), modelling (case studies – regional and global – POLMIP)

• General:

➤ Revisit project deliverables – report due Month 18 (APRIL/MAY 2013)

➤ Plans for papers

➤ *Article on spring campaigns – CNRS magazine?*

➤ *Update CLIMSLIP website and LOGO*

➤ *Timings of CDD recruitments?*

CLIMSLIP

ANR-CLIMSLIP: Main Objectives

- **Quantify sources contributing to tropospheric aerosols and ozone (esp. boreal fires) in the Arctic (T2, 4, 6, 7)**

- *Combined data analysis + regional/global modelling of ozone & aerosol budgets*

- **Reduce uncertainties in sources Arctic methane (T2, 7)**

- *New methane data over Siberia (YAK) + inverse modelling of CH₄ sources*

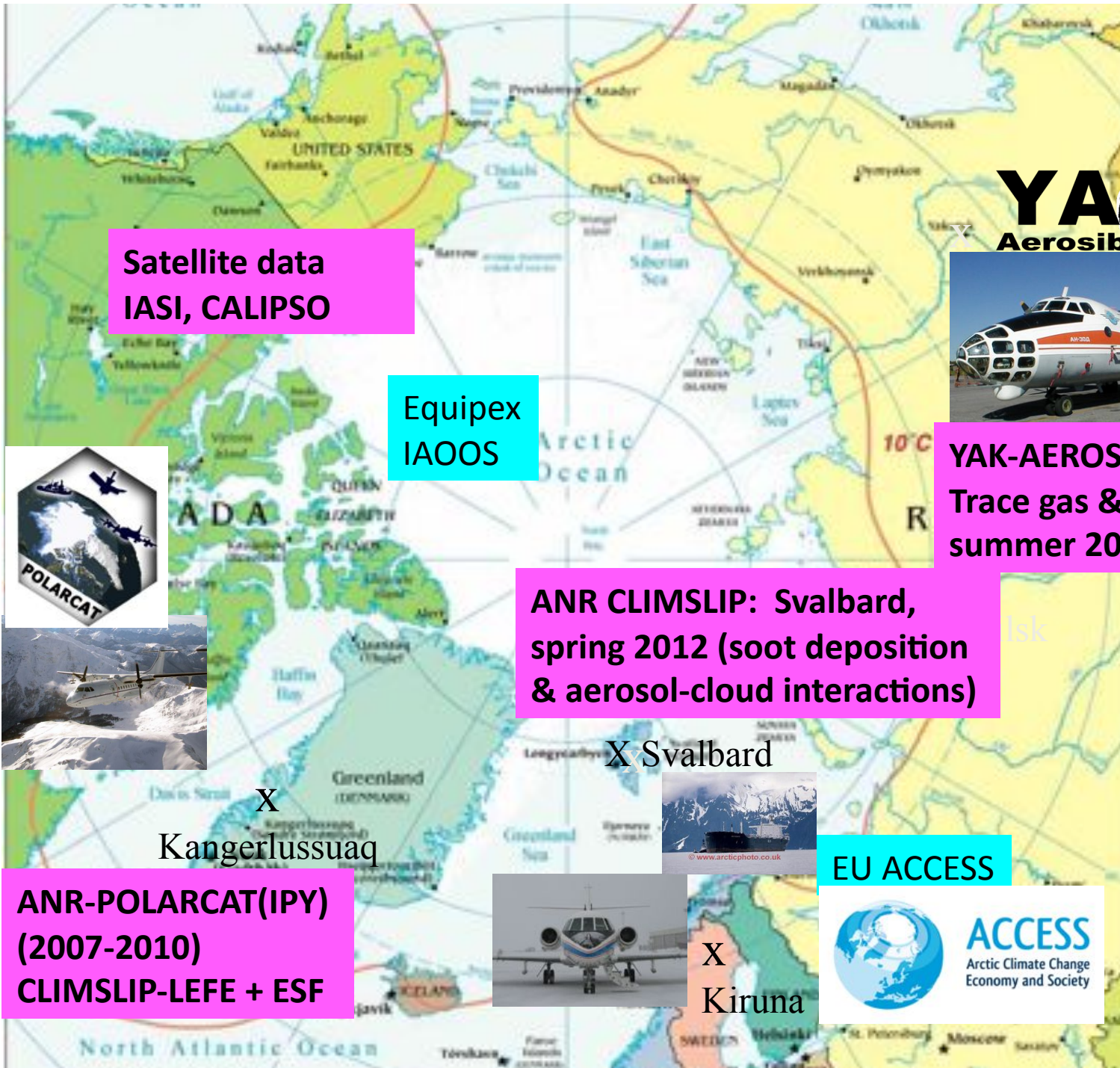
- **Study impact of anthropogenic pollution on Arctic cloud properties and aerosol direct/indirect radiative forcing (T3,4)**

- *New near-continuous ground-based measurements on aerosol-cloud interactions (Svalbard) and meso-scale modelling*

- **Determine snow albedo changes from soot deposition (T5)**

- *New data on soot deposition & distribution in the snowpack (Svalbard) plus 1D and regional modelling – impacts on surface albedo & regional climate*

ANR CLIMSLIP: LINKS TO OTHER PROJECTS



Satellite data
IASI, CALIPSO

Equipex
IAOOS



YAK-AEROSIB
Trace gas & aerosols
summer 2013, Siberia



ANR CLIMSLIP: Svalbard,
spring 2012 (soot deposition
& aerosol-cloud interactions)

X
Kangerlussuaq

X Svalbard



ANR-POLARCAT(IPY)
(2007-2010)
CLIMSLIP-LEFE + ESF



X
Kiruna

EU ACCESS



EU ECLIPSE



**TASK 2: BOREAL SOURCES OF TRACE GASES AND AEROSOLS
(LEADERS S. TURQUETY/LMD, J.D. PARIS/LSCE)
Contributions: LMD, LSCE, LATMOS, LAMP**

Task 2 : Boreal sources of trace gases and aerosols			
D2.1	Measurement of CO, O ₃ , aerosols and other parameters over Siberia during a 1-week period (YAK campaign)	3	6
D2.2	Lidar instrument implementation on the YAK Russian aircraft and define the overall aerosol measurement protocol with our Russian colleagues	1,3,2	6
D2.3	Analysis of CO, O ₃ and aerosols measurements using retroplumes and identification and characterization of biomass burning plumes in the dataset	1,3	12
D2.4	Evaluation of different fire injection height parameterisations	5	12
D2.5	Implementation of improved fire parameterization in LMDz-INCA and evaluation of the trace gas distributions using satellite (IASI) and aircraft data	5	15
D2.6	Analysis of CH ₄ measurements, identification of particular features in the dataset and assessment of potential CH ₄ sources and sinks	3	15
D2.7	Quantification of the global impact of wildfires on the ozone, methane and aerosol budgets	5,3	24

TASK 3: Aerosol-cloud interactions (leaders: O. Jourdan and A. Schwarzenboeck/LAMP)
Contribution: LaMP, LATMOS

Task 3 : Aerosol-cloud interactions			
D3.1	Measurement campaign on Mt Zeppelin	2	6
D3.2	Dataset from measurements at Mt. Zeppelin on cloud/aerosol properties	2	12
D3.3	Aerosol particle analysis including super-micron and submicron samples of individual CCN and IN particles during ASTAR, POLARCAT and SORPIC aircraft missions.	2	12
D3.4	Data base of new aerosol and microphysical measurements in Arctic clouds at Mt Zeppelin	2	24
D3.5	Use of satellite observations in synergy with aircraft and ground-based in situ and remote sensing measurements to study potential impact of pollution aerosol (pathways) on cloud phase modifications.	1	24

TASK 4: AEROSOL RADIATIVE HEATING (LEADER F. RAVETTA)
Contributions: LATMOS: J. Pelon, L. Doppler, J.-C. Raut;
LaMP: A. Schwarzenboeck, B. Quennehen

Task 4: Aerosol radiative heating			
D4.1	Analysis of aerosol optical properties and altitudes from clear sky aerosol samples	2	12
D4.2	Model calculations of radiative forcings induced as a function of altitude and absorption properties	1	18
D4.4	Results from one closure study using airborne and satellite observations	1	24
D4.5	Evaluation of modelled radiative heating estimates	1	30

TASK 5: BC IN SNOW (LEADER H.-W. JACOBI)

Contributions: LGGE : 1 postdoc, Laj, Jaffrezo, Cozic, Villani, Gallée ; LATMOS : Raut, Law

Task 5 : BC in snow			
D5.1	3-week field campaign at Ny-Alesund including measurements with the SP2 instrument and snow sampling for chemical analysis	4	4
D5.2	Chemical analysis of snow and aerosol samples collected in Ny-Alesund and determination of the origin of the aerosols	4	12
D5.3	Upgrade of the snowpack model to include the effect of impurities on the radiation transfer in the snowpack and the BC behaviour in the snowpack	4	12
D5.4	Improved parameterization of BC deposition to the snow	4	18
D5.5	Determination of the effect of absorbing impurities on the albedo of the snow	4	24

TASK 6: TRANSPORT AND PROCESSING OF OZONE AND AEROSOL IN POLLUTANT PLUMES (LEADERS G. ANCELLET/K. LAW)

Contributions: LATMOS: J. Pelon, A. Auby, F. Ravetta; LMD: S. Turquety, LSCE : J.D. Paris

Task 6 : Aerosol and ozone plume processing			
D6.1	Initial conditions for Lagrangian calculations of Arctic chemical and aerosols (simulations of WRF-Chem or LMDz-INCA)	5, 1	6
D6.2	Lagrangian model runs and interpretation of the results to assess the photochemical production and ozone/sulphate correlation	1	12
D6.3	New case studies of long-range transport based on data collected in surface sites (Mt Zeppelin, Summit, Finland)	1	18
D6.4	Joint analysis of ozone/CO/meteorological parameter to derive O ₃ /PV relation and mixing efficiency at the edge of stratospheric streamer	1	18
D6.5	Quantification of stratospheric air mass transport for two stratospheric intrusions using meso-scale model	1	18
D6.6	Use of statistical tools for assessment of the long-term ozone record over Canada and Greenland	1	26
D6.7	Joint analysis of YAK aircraft aerosol measurements and CALIPSO satellite data	1,3	30

TASK 7: REGIONAL AND GLOBAL MODELLING (LEADERS J.-C. RAUT, LATMOS, I. PISON/LSCE)

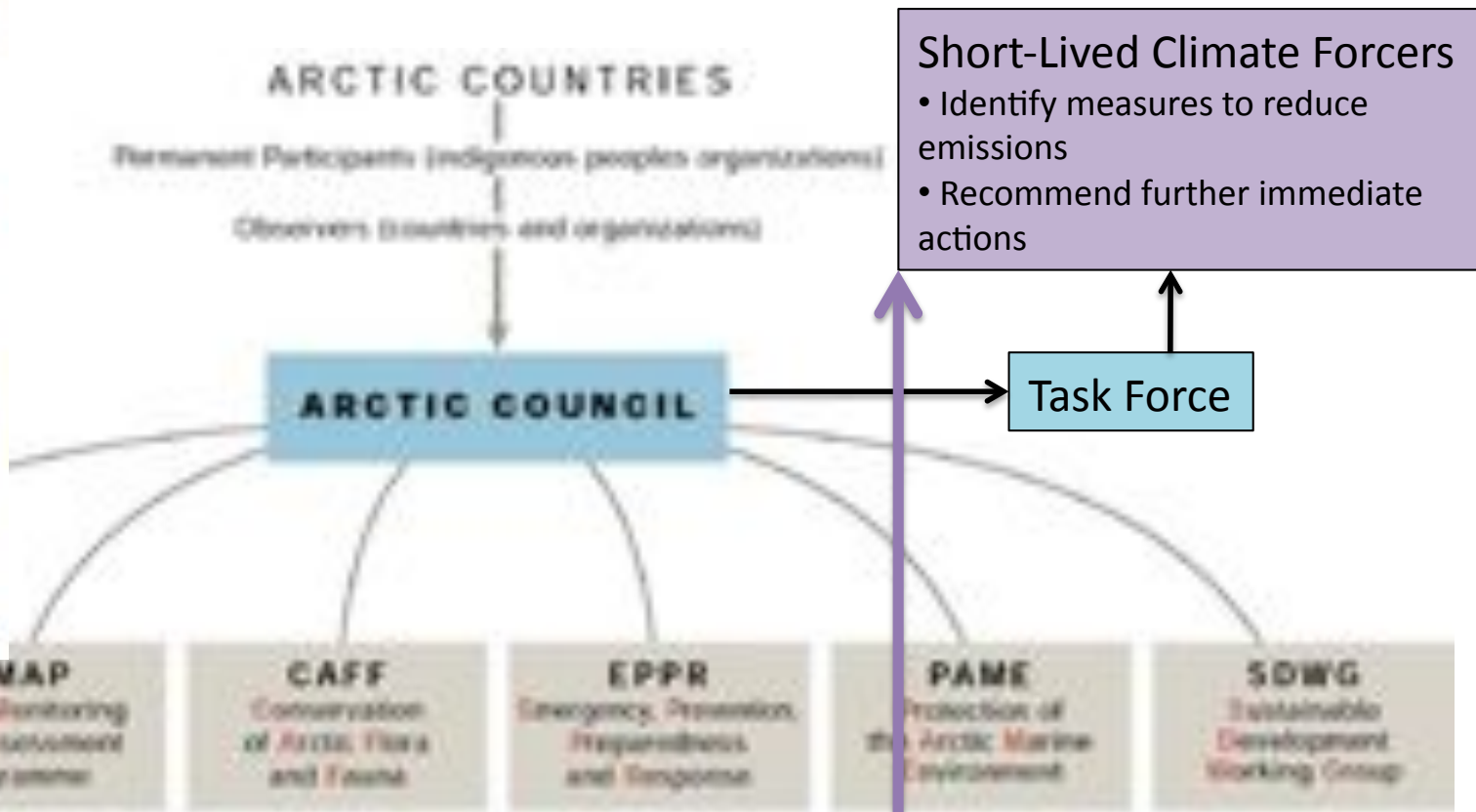
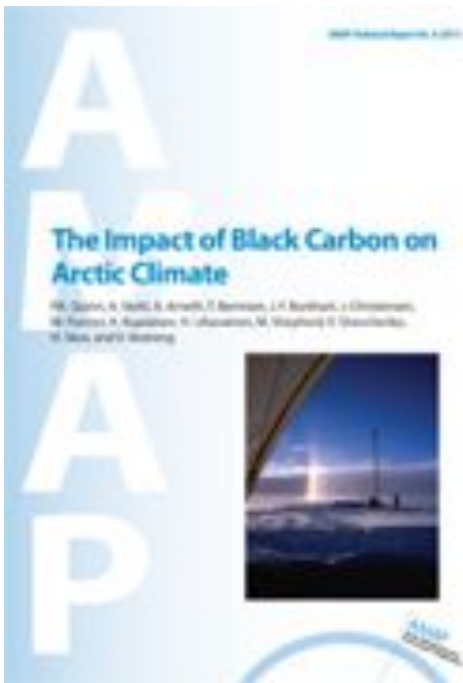
Contribution: LATMOS, LSCE : 1 postdoc, I. Pison, LMD : S. Turquety ; LGGE: H. Gallée

Task 7 : Regional and global modelling			
D7.1	Initial conditions for Polar-WRF and calculations of Arctic chemical and aerosols previously optimized emission scenarios and simulations of LMDZ-INCA model.	5	6
D7.2	Simulations of the Arctic atmosphere composition for gases (CH ₄ , CO, O ₃ , NO _x , ..) and aerosols using LMDZ-INCA based on available inventories and optimized scenarios (for methane), contribution to POLMIP	5, 1	6
D7.3	Assessment of the transport and mixing processes of pollutants (trace gases and aerosols) using an analysis of the semi-Lagrangian tracer distribution in regional model	1	12
D7.4	Evaluation of model simulations of trace gases by comparisons to satellite observations (IASI) available in situ measurements (POLARCAT and YAK campaigns), (surface networks, ozonesondes, MOZAIC aircraft observations)	5	15
D7.5	Global simulation using LMDz-INCA source attribution tracers to quantify pollutant contributions to Arctic	5	15
D7.6	Assessment of the model cloud/radiation module by testing the dependence of the radiative fluxes with the observed cloud properties	1,4	18
D7.7	Analysis of the regional model aerosol budget to quantify deposition processes	1	24
D7.8	Run of regional model with and without the aerosol-chemistry	1, 4	30

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D7.8	Run of regional model with and without the aerosol-chemistry module, and with and without the BC deposition in snow, respectively to quantify the radiative impact aerosols in the Arctic	1, 4	30
D7.9	3D cloud modelling dedicated particularly to the ice phase nucleation in Arctic mixed phase clouds	2	24
D7.10	Inversion of methane emissions in the Arctic for recent years	3	24

Upcoming Meetings

- EGU – 7 to 12 April, Vienna – relevant sessions?
- ASSW (Arctic Summit Science Week), 13 to 19 April 2013, Krakow, Poland
- Arctic Observing Summit – 30 April to 2 May 2013, Vancouver, Canada (SAON etc.)
- **Chantier Arctique national colloque – 3 to 5 June 2013, College de France, Paris**
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Short-Lived Climate Forcers

- Identify measures to reduce emissions
- Recommend further immediate actions

Task Force

Expert Group

Short-Lived Climate Forcers

- provide scientific and technical advice regarding
 - formulation of mitigation strategies
 - assessment of Arctic climate benefits of mitigation strategies

New report in prep. for 2014 on tropospheric ozone in the Arctic

Multidisciplinary drifting Observatory for the Study of Arctic Climate

MOSAIC

Science Planning Workshop

27-29 June 2012

Boulder, CO, USA

Workshop hosts:

Ola Persson & Matthew Shupe

CIRES, University of Colorado & NOAA-ESRL

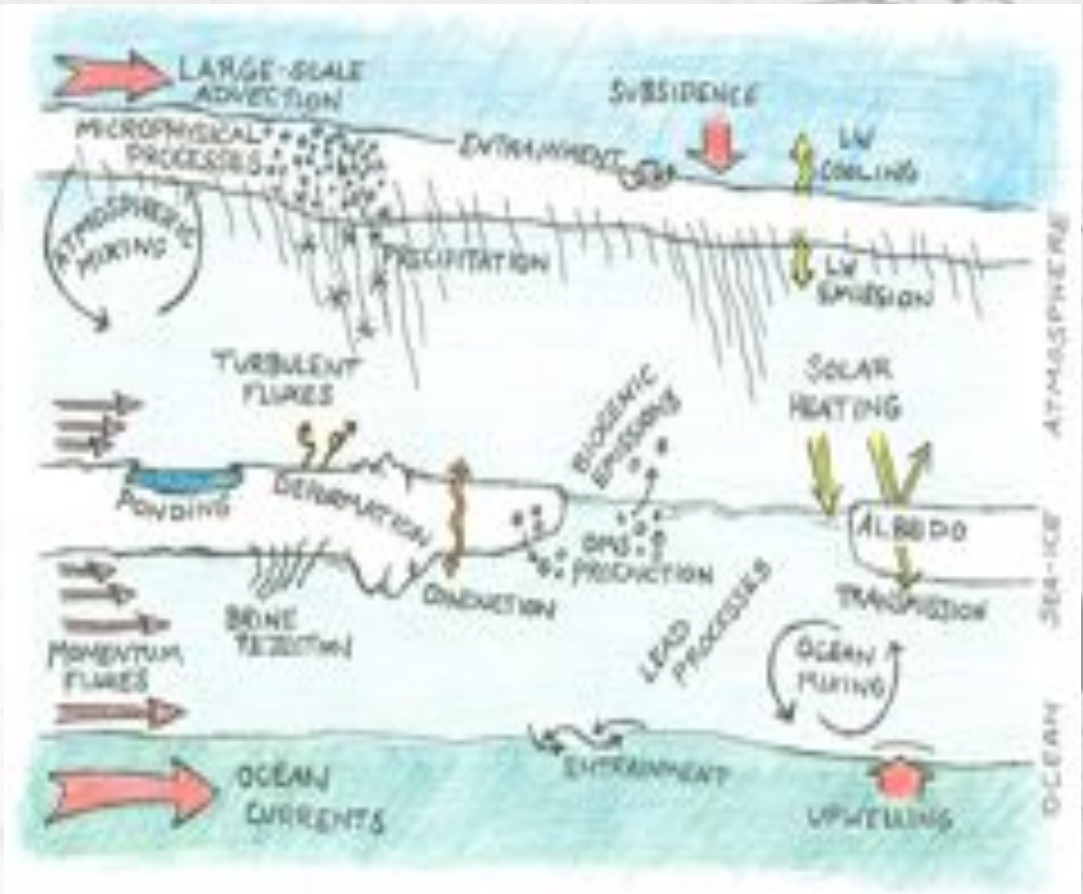


International Arctic Science Committee

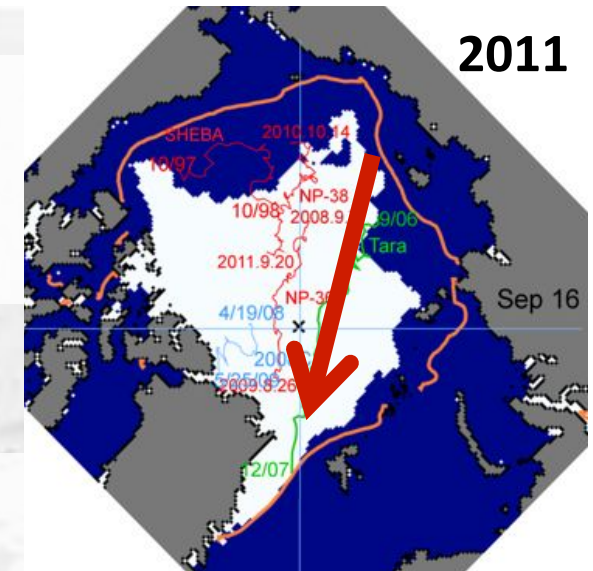
The Science of MOSAiC

Broad Themes

- Changes in circulation patterns and impact on local processes
- Understanding sea-ice loss and mass, energy, motion budgets
- Transfer of momentum, heat, moisture, gases, aerosols, etc.
- Processes active in the “new” Arctic (1st year vs. multi-year)
- Large-scale vs. local processes
- **Includes atmospheric composition – ozone & aerosols, clouds etc.**



What is MOSAiC?



Preliminary design elements:

- Multi-year experiment with transpolar drifting station (ice-breaker) with ice camps - *at least 1 full year*
- Focus on first-year ice (new Arctic regime), improving polar prediction
- **Writing science plan –workshop 2013**
- Looking for multi-national funding inc. EU – link to WCRP/WWRP Year of Polar Prediction (YOPP), 2016/7