MOSAiC

Multidisciplinary drifting Observatory for the Study of Arctic Climate

Science Plan Writing Team

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Detailed process study to understand coupled central Arctic climate system

1) Central observatory on an ship
2) Distributed observation network
3) Coordinated modeling activities

Timeframe: 2018-2019, Covering full annual cycle

Location: Central Arctic Basin ice pack, Targeting 1st-year sea ice

Who: International science team, funding and infrastructure

Coordination: IASC

MOSAiC Science Plan

What are the causes and consequences of an evolving and diminished Arctic sea-ice cover?

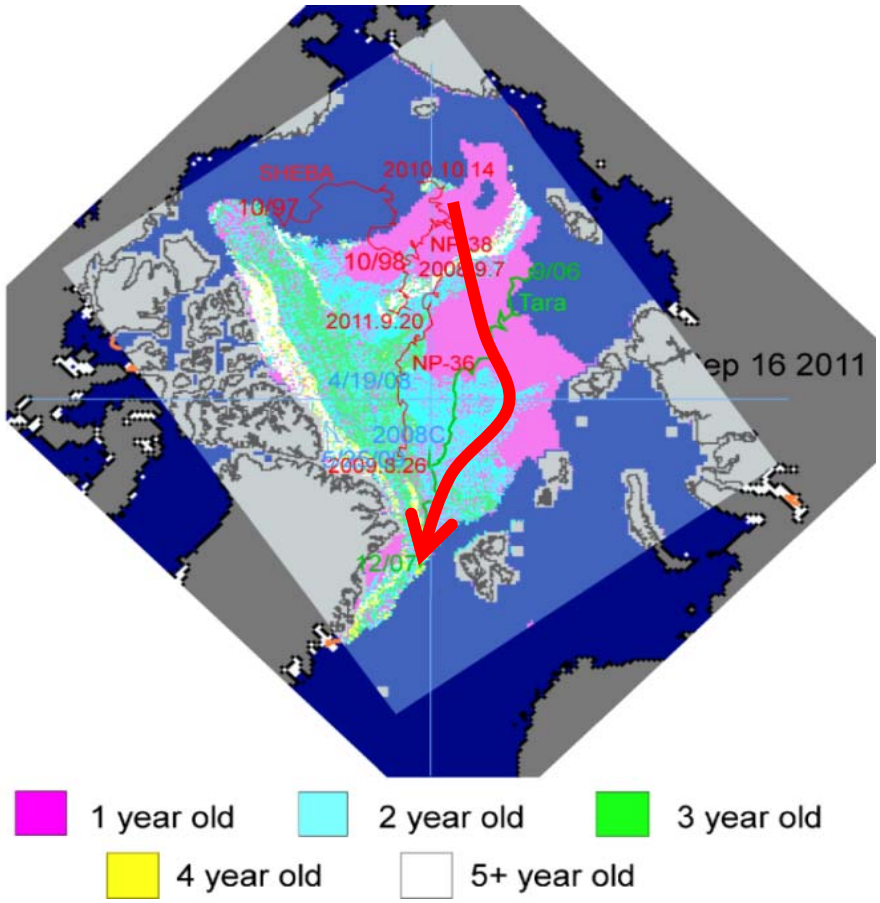
Key Science Themes

- **Surface energy budget, mixing, fluxes**
- **Sea-ice motion and deformation**
- **Cloud/precip processes & BL structure**
- **Biological productivity, elemental cycles**
- **Large-scale heat and mass transfer**

Plan outlines and justifies observation & model approaches

First draft for public comment: Spring 2014

The MOSAiC Drift



September 2011 sea ice extent and age (NSIDC). Numerous drift tracks of drift stations suggest possible observatory tracks

When:

October 2018-October 2019

covering at least an annual cycles

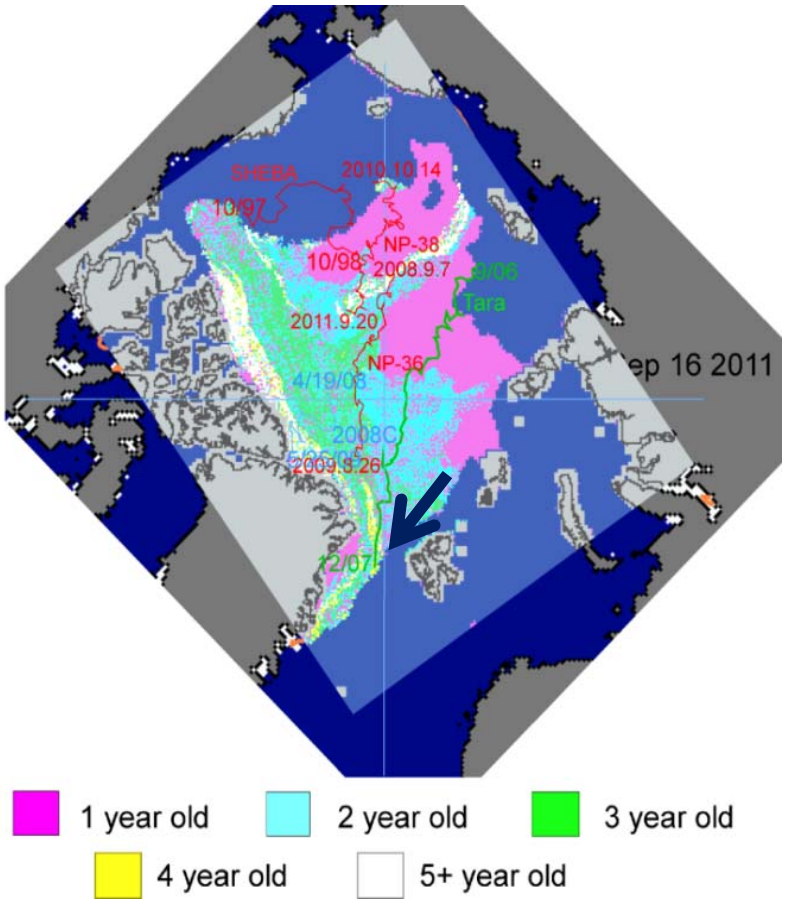
Where:

Central Arctic Basin ice pack

Who:

- **Coordinated through IASC**
- **International participation: US, Germany, Sweden, Russia, Finland, Norway, France, Canada, Korea, Japan, China**
- **International infrastructure**
- **Synchronized international funding**

Pilot study RV LANCE Drift



When:

RV Lance January 2015-June 2015

Steen et al. 2013

Aim:

Effects of thin first year ice regimes on energy flux, ice dynamics, ecosystems, local and global climate

Where:

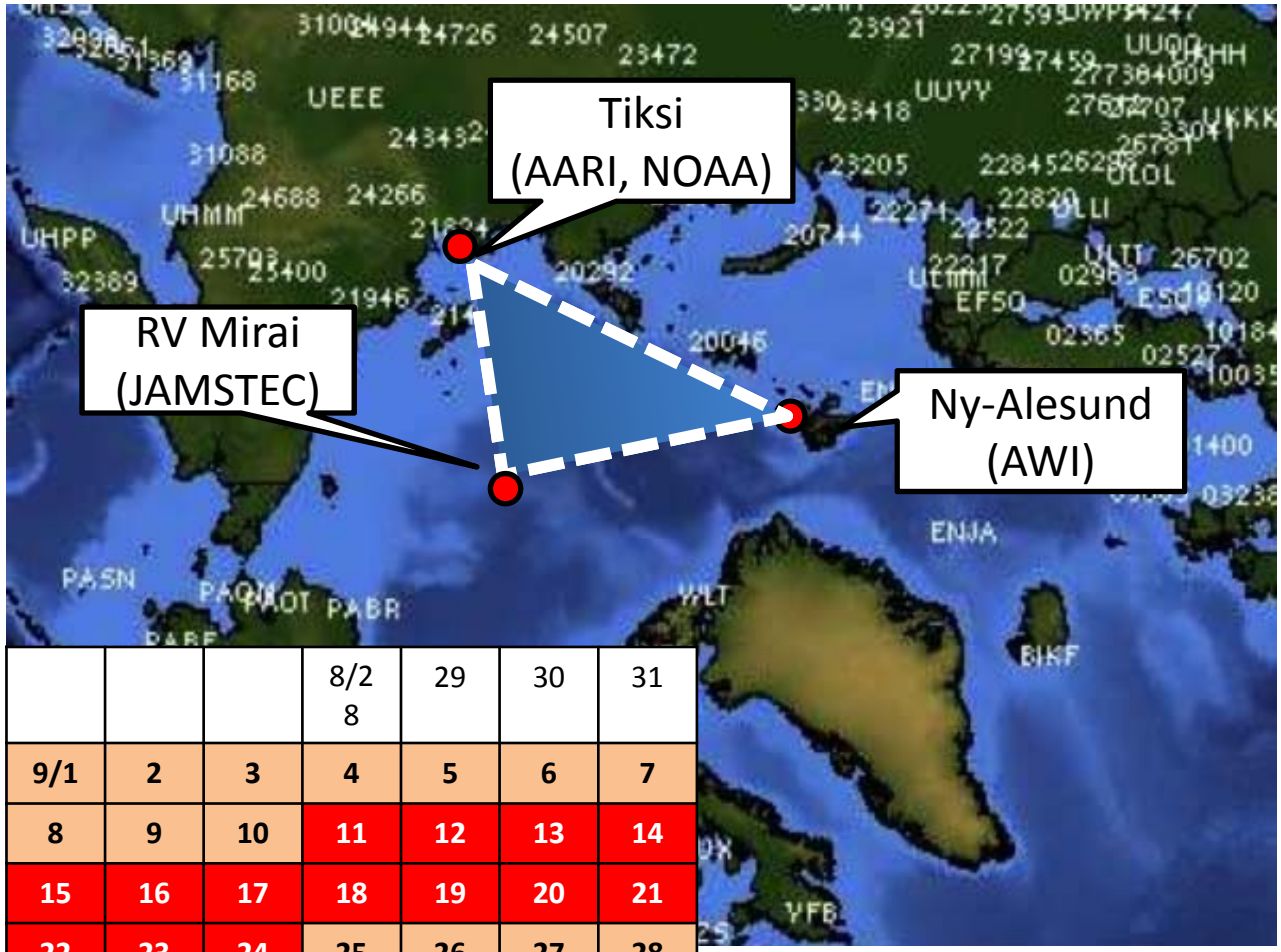
North of Svalbard

Ice drift southwest planned

Who:

- **Norwegian young sea ice cruise N-ICE2015**
- **Centre for ice, climate, ecosystems**
- **Collaboration: iAOOS UPMC Paris British Antarctic Service, AWI, AARI, FMI**

Pilot study: **A**rctic **R**esearch **C**ollaboration for**R**adiosonde **O**bserving **S**ystem **E**xperiment (**ARCROSE 2013)**



			8/28	29	30	31
9/1	**2**	**3**	**4**	**5**	**6**	**7**
8	**9**	**10**	**11**	**12**	**13**	**14**
15	**16**	**17**	**18**	**19**	**20**	**21**
22	**23**	**24**	**25**	**26**	**27**	**28**
29	**30**	10/1	2	3	4	5
6	7					

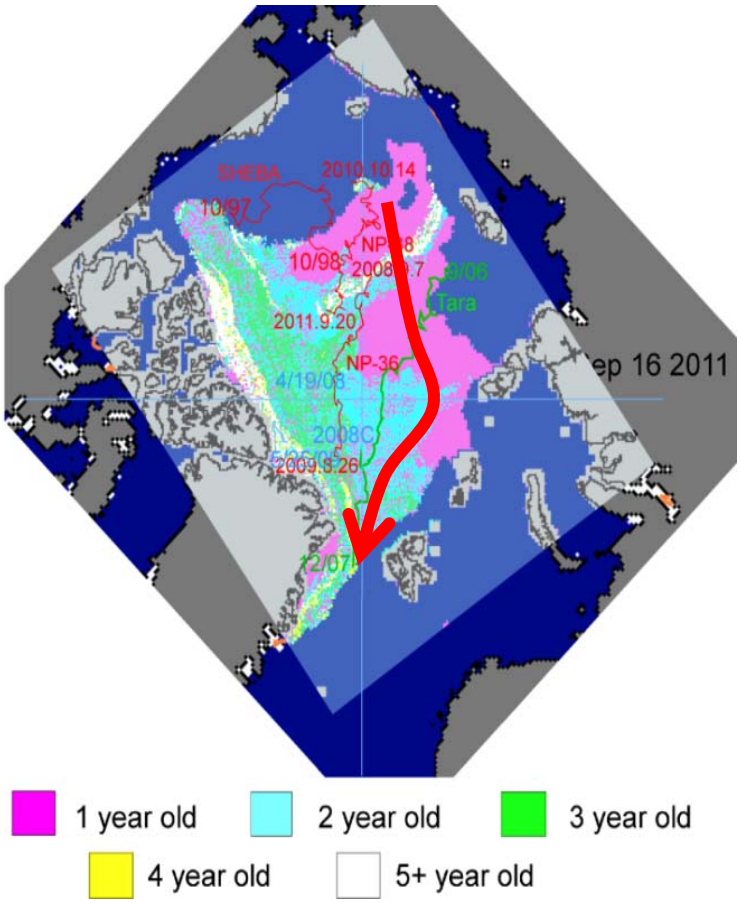
Intense radiosonde observations
Assimilation into data assimilation system ALERA2

Inoue et al. 2014

Participation:
Jamstec
NIPR
AWI
AARI
CLiC

Ny-Alesund: **6 sondes**/day (11-24 September)
Tiksi: **4 sondes**/day (September)

MOSAiC Drift → Next steps



- RV Polarstern II expected in 2019
- AWI logistical feasibility study 2013 for MOSAiC drift
- Second RV for maintenance required
- Submission of a new Polarstern I proposal until September 2014 following the earlier submitted proposal Dethloff et al., 2013
- AWI decision expected in 2015
- MOSAiC science plan

  Shupe et al., in preparation 2014

  Gridbox measurements

  Array of RVs
- Linkages ICARPIII, YOPP, CLiC
- Synchronised funding:

  EU HORIZON 2020, NSF