



SCAR Sub-Group

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SG

PS/LS/GS

Person  
Responsible:

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## SCAR Delegates Meeting 2018

Davos, Switzerland, June 2018

### Antarctic Sea ice Processes and Climate (ASPeCt) 2016-2018 Report

#### Report Author(s)

Marilyn Raphael (USA)

#### Summary of activities from 2016-18 and any other important issues or factors (<200 words)

The period 2016 – 2018 has been a very active one for ASPeCt.

*Administratively* - ASPeCt updated and submitted its Terms of Reference and created a new leadership structure under which it now operates. The group is now led by a Chair (Marilyn Raphael) a Vice Chair (to be nominated) an Immediate Past Chair (Steve Ackley) an Early Career Scientist position or Junior Officer (Stefanie Arndt) and a Communication and Data Executive (Petra Heil). The terms of service are arranged so that there is opportunity for the leadership to be renewed every two years. *Scientifically* - In 2017, the PIPERS cruise into the early winter Ross Sea was successfully completed and initial reports on the outcomes will be made at the SCAR POLAR18 OSC. In 2018, ASPeCt scientists at AWI conducted a Polarstern expedition to the Weddell Sea, deploying 24 ice-tethered platforms to collect data on the seasonal variability of sea-ice and snow properties. ASPeCt underway data were collected on several cruises with contributions from a number of different countries. Additions to the ASPeCt ship observations database are being made on a continuing basis.

ASPeCt members convened sessions at regular science conferences and held a meeting at the IGS conference in New Zealand in 2017. New ideas for projects were discussed.

#### Recommendations that EXCOM and Scientific Group Chief Officers should consider

*(Please indicate if approval is necessary or if they are just asked to note information)*

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#### Summary Budget 2017 to 2020

	2017	2018	2019	2020
	Spent	Allocated	Request	Request
(US\$)	710	3000	3000	5000

## Progress and Plans

### Sub-group Major Outcomes/Activities

*(No more than three major developments with one paragraph describing each of no more than ~ 300 words. Why important, why now?)*

The PIPERS cruise on N. B. Palmer into the early winter Ross Sea took place between April 11 and June 14 2017. It was the first winter research voyage into the Ross Sea in nearly 20 years. Funded by the NSF, the cruise was led by ASPeCt co-Chair Steve Ackley and included researchers from a number of different countries. The keystone project was to investigate the Atmosphere-Ice-Ocean interaction in the Terra Nova Bay and Ross Ice Shelf coastal polynyas. The cruise however involved multidisciplinary and complementary activities that were conducted in several different phases of the cruise. These activities were: ARGO and SOCCOM Float deployments north of the sea ice; marginal ice zone(MIZ) wave buoy deployments and sampling activities; along track sampling for physical oceanography, trace metals, and trace and noble gasses; ice thickness, roughness and physical property sampling at ice stations; gas fluxes(CO<sub>2</sub>, DMS, Methane) and sea ice biogeochemistry sampling at ice stations and in polynyas; boundary layer profiling using drone aircraft and met towers at ice stations; and atmosphere, ice and ocean investigations in the coastal polynyas. Numerous presentations on the scientific outcomes of this cruise are on the programme of the SCAR POLAR18 OSC. Detail of the cruise may be found here:

<http://www.utsa.edu/LRSG/PIPERS/index.htm>

ASPeCt administrative changes: ASPeCt leadership structure has been rearranged to consist of a Chair, Vice Chair, Immediate past Chair, a Junior officer (ECS) and a Communication and Data Executive. The terms of service are arranged so that there is opportunity for the leadership to be renewed every two years yet still maintain continuity. With this rearrangement Steve Ackley, who has led ASPeCt continuously and with distinction, since its origin, has stepped down from being co-Chair but remains in an advisory role as Immediate Past Chair.

### Sub-group Outcomes Summary

*(Summarize the above and in each case provide your sub-group name in left hand column)*

Sub-group	Activity/Outcome/Benefit/Achievement
ASPeCt	PIPERS cruise into the winter Ross Sea. Analysis of the data collected will increase our understanding of the role of polynyas in climate and help understand contemporary trends in Antarctic sea ice.


### Sub-group Cash Flow

(From previous Delegates meeting to date)

Sub-group	Allocation	Amount spent		
		2016	2017	2018
ASPeCt	\$6000	-----	710	5290

### Notable Papers

(Three most notable papers, if applicable)

1. HOBBS, W., R. MASSOM, S. STAMMERJOHN, P. REID, G. D. WILLIAMS, and W. N. MEIER (2016): A Review of Recent Changes in Southern Ocean Sea Ice, their Drivers and Forcings. *Global and Planetary Change*, 143, 228-250. DOI: 10.1016/j.gloplacha.2016.06.008.

This work, led by ASPeCt scientists, summarises the research to date on observing Antarctic sea ice trends, identifying their drivers, and assessing the role of anthropogenic climate change. Whilst the atmosphere is thought to be the primary driver, the ocean is also essential in explaining the seasonality of the trend patterns.

2. Meiners, K. , Arndt, S. , Bestley, S. , Krumpfen, T. , Ricker, R. , Milnes, M. , Newbery, K. , Freier, U. , Jarman, S. , King, R. , Proud, R. , Kawaguchi, S. and Meyer, B. (2017): Antarctic pack ice algal distribution: Floe-scale spatial variability and predictability from physical parameters, *Geophysical Research Letters*, doi:10.1002/2017GL074346.

This work, led by ASPeCt scientists provides an unprecedented view of ice algal biomass distribution, mapped (as chlorophyll a) in a 100 m by 100 m area of a Weddell Sea pack ice floe, using under-ice irradiance measurements taken with an instrumented remotely operated vehicle.

3. Wongpan, P., K.M. Meiners, P.J. Langhorne, P. Heil, I.J. Smith, G.H. Leonard, R.A. Massom, L.A. Clementson and T.G. Haskell. (2018) Estimation of Antarctic land-fast sea ice algal biomass and snow

thickness from under-ice radiance spectra in two contrasting areas. *J. Geophys. Res. Oceans*, <https://doi.org/10.1002/2017JC013711>

This work, led by one of ASPeCts ECS, examines the relationships between normalized difference indices (NDI) calculated from *under-ice radiance* measurements and *sea ice algal biomass* and *snow thickness* for *Antarctic fast ice*.

### **Forthcoming Activities**

Development of ASPeCt ship-based automated instrumentation of sea ice observation. ASPeCt's sea ice observation platform is now established, the software is working and observations are being contributed consistently by research cruises in the region. A natural next step in the evolution of sea ice observation is automation of observation and recording of such information in a way that matches the present ASPeCt protocol.

ASPeCt will convene a session (4 separate sections) on Antarctic sea ice processes and ice shelves status at the SCAR OSC in Davos, Switzerland (June 2018) and will also hold a side-meeting on June 17<sup>th</sup>, before the OSC begins. Scientists from the PIPERS cruise will also hold a meeting during the week of the SCAR POLAR18 OSC.

ASPeCt will hold a workshop at the SCAR 2020 OSC in Hobart, Tasmania. This will be the first full-scale workshop that ASPeCt has had in six years and will highlight the group's achievements as well as establish plans for future group efforts.

#### *Continuing work:*

- Additions to the ship observations database (ASPeCt observations) are also being made on a continuing basis.

- Continuing contribution to the annual BAMS/NOAA State of the Climate assessment reports, re Antarctic sea ice extent and seasonality  
<http://www.ncdc.noaa.gov/bams-state-of-the-climate/>.

## **Budget**

### **Planned use of funds for 2018 to 2020**

(Please provide detail of all activities with total at end, start with 2020 and work back to 2018 down the table)

<b>Year (YYYY)</b>	<b>Purpose/Activity</b>	<b>Amount (in USD)</b>	<b>Contact Name</b>	<b>Contact Email</b>
<b>2020</b>	Fund travel and participation in an ASPeCt Workshop at SCAR 2020	\$5000	Marilyn Raphael	raphael@geog.ucla.edu

<b>2019</b>	Fund travel and participation in ASPeCt-related meetings.	\$3000	Marilyn Raphael	raphael@geog.ucla.edu
<b>2018</b>	Fund travel and participation in ASPeCt side-meeting at SCAR POLAR18	\$3000	Marilyn Raphael	raphael@geog.ucla.edu
<b>Total</b>		<b>\$11000</b>		

**Briefly describe what the funds will be used for and what the desired results are**

*(Use the same subtitles as the line items above with no more than 1-3 sentences per item. Please keep these high-level. Please also make clear note of expenditure associated with Davos meeting in 2018 both here and in the table above)*

**2018:** The requested funds are being used to support the travel of several Early Career Scientists and the ASPeCt Chair to attend and participate in the ASPeCt side-meeting and scientific sessions at the SCAR POLAR18 OSC.

**2019:** ASPeCt members convene sessions at regular science conferences and ASPeCt leverages members' attendance to hold sub group meetings to ensure that progress is made on ASPeCt goals. ASPeCt members also attend meetings of groups with which it would like to form closer ties. To that end ASPeCt requests \$3000 to support ASPeCt-related travel to science conferences and to coordinate with other groups. The requested funds will be targeted primarily to support the travel of early career scientists

**2020:** ASPeCt plans to hold a full Workshop at the SCAR 2020 meeting in Hobart, Tasmania. This is a meeting that can be expected to draw many ASPeCt members is expected to showcase the work that ASPeCt has completed as well as discuss progress on continuing work. The requested funds will be targeted primarily to support the travel of early career scientists to attend and participate in the Workshop.

**Percentage of the budget to be used for support of early career researchers**

2018: Here we expect at least 50% of the budget to go towards funding ECSs.

2019: Here we expect at least 50% of the budget to go towards funding ECSs.

2020: Here we expect at least 50% of the budget to go towards funding ECSs.

**Percentage of the budget to be used for support of scientists from countries with developing Antarctic programmes**

2018: This is not known but we expect to include ECSs from such countries.

2019: This is not known but we expect to include ECSs from such countries.

2020: This is not known but we expect to include ECSs from such countries.

## Linkages

**Direct support from outside organisations received for your activities**  
(Numbered list with values indicated if direct cash support. Please restrict in-kind support to substantive in-kind support only)

ASPeCt normally receives funds from CliC each year. These funds are used mainly to support attendance of early career scientist to ASPeCt workshops. They are sometimes used to support the attendance of one of the coChairs at a CliC sponsored meeting. For example, funds from the 2016 budget were used to support travel for Stefanie Arndt, ASPeCt's new EC Junior Officer at the ASPeCt Workshop held during the IGS meeting in New Zealand in February 2017. However due to budgetary issues, ASPeCt is not directly funded by CliC in 2017-2018.

**Major collaborations your sub-group has with other SCAR groups and with organisations/groups beyond SCAR**

### Within SCAR

1. ASPeCt co-chair Marilyn Raphael is a member of the AntClim21 SSG and led the sea ice component of the Great Antarctic Climate Hack Workshop sponsored by AntClim21 in October 2017.
2. Inga Smith a member of ASPeCt, is also Co-Chair of the CLIVAR/CliC/SCAR Southern Ocean Region Panel (SORP). She coordinates activities of interest to both groups for example ASPeCt interest in working more closely with SORP on Ocean Observations Panel for Climate (OOPC). Two other ASPeCt members serve on the Panel.

### Outside SCAR

1. ASPeCt was an important planner and participant in the USA's **National Academy of Science's Antarctic sea ice variability and trends workshop** held in January 2016. More than five ASPeCt members were involved.
2. Continued representation on the World Climate Research Programme (WCRP) and SPARC's Polar Climate Predictability Initiative (PCPI) via membership on the leadership (Marilyn Raphael).
3. Year of Polar Prediction Southern Hemisphere (YOPP-SH) - Francois Massonnet was supported by ASPeCt to attend the most recent joint meeting in June, 2017, in Boulder, CO. There he presented the project SIPN South. SIPN South aims at collecting and analysing seasonal sea ice forecasts in the Southern Ocean for the next two years (2017-2019).

4. Southern Ocean Observing System (SOOS) – ASPeCt member Burcu Ozsoy (Turkey), is a Scientific Member on the SOOS Scientific Steering Committee.

\*\* Numerous ASPeCt scientists are also individually involved with (i.e leading) their national programs focused on the Antarctic and sea ice observation. For example, Dr. Burcu Orszoy leads the fledgling Turkish Antarctic project.

## Outreach and Capacity Building

### **Outreach, communication and capacity building activities**

ASPeCt supported Trond Robertsen an ice analyst with the Norwegian Ice Service to carry out ice observer training on a South African Antarctic cruise in June 2016. Trond trained students to do ice observations and interpret what they see, using ASPeCt protocols and WMO nomenclature. This effort is the first in support of the “clear [and] open interest from the South African Department of Science and Technology as well as the other major institutes” to measure and collect sea ice data during their Antarctic cruises.

New Zealand ASPeCt members have written 4 magazine/newspaper articles, participated in several radio interviews and have had outreach activities in the Otago Museum.

German ASPeCt members (based at AWI) participated in the outreach project “Adopt a buoy”, where all Snow Depth and Ice-Mass balance Buoys deployed during the PS111 project cruise were decorated with pictures painted by children from all over Germany. Some impressions of the project may be found (in German) at: <http://www.meereisportal.de/meereisexpedition/buntes-bojen-abenteuer/>

ASPeCt has a mailing list of more than 50 members. This mailing list is housed at the Los Alamos Lab and administered by Elizabeth Hunke as well as the ASPeCt leadership. The mailing list is used frequently to inform the group, to foster discussion about ASPeCt activities and to collect information about the results of ASPeCt-related activities. The mailing list is quite diverse in terms of gender and nationality.

### **SCAR Fellowship Reviewers**

As part of SCAR’s Capacity Building efforts, such as the Fellowships and Visiting Professor Awards, we are looking for people from all the SCAR groups including SRPs to form a ‘review panel’ so if applications in your field are submitted we have people to contact to help assess relevant applications. Please list one or more people (name and email address) from your SRP who would be willing to serve as reviewers for the next few years, along with 1-3 keywords on their principal expertise.

First Name	Last Name	E-mail	Principal Expertise
<b>Robert</b>	Massom	Rob.Massom@aad.gov.au	Sea ice
<b>Sharon</b>	Stammerjohn	sharon.stammerjohn@colorado.edu	Sea ice
<b>Will</b>	Hobbs	will.hobbs@utas.edu.au	Sea ice

## Membership

### Leadership

Role	First Name	Last Name	Affiliation	Country	Email
<b>Chair</b>	Marilyn	Raphael	UCLA	USA	raphael@geog.ucla.edu
<b>*Junior Officer (ECS)</b>	Stefanie	Arendt	AWI	Germany	stefanie.arndt@awi.de
<b>Immediate Past Chair</b>	Stephen	Ackley	UTSA	USA	ackley@utsa.edu
<b>Communication and Data Executive</b>	Petra	Heil	AAD	AUS	Petra.heil@utas.edu.au

*Please identify Early Career Scientists with \* in first column*

### Other members:

#### Original Group Membership

S.F.Ackley (Co-Chair, USA)	Marilyn Raphael (Co-Chair, USA)
*Kay Ohshima (Japan)	*Elizabeth Hunke (USA)
Martin Vancoppenolle (Fr)	Marcel Nicolaus (Ger)
*Petra Heil (Australia)	*Klaus Meiners (Australia)
*Rob Massom (Australia)	*Sharon Stammerjohn (USA)
*Ted Maksym (USA)	Ron Kwok (USA)
Thorsten Markus (USA)	Timo Vihma (Finland)
*Pat Langhorne (NZ)	*Jean Louis Tison (Be)
Hyoungh Chul Shin (Ko)	

**Currently, our mailing list numbers more than 50. We can send that list in other email if necessary. \* Advisory Group member.**



**Requests to the Secretariat**

*(If there are specific administrative tasks you would like help with such as your webpages, mailing list, online meeting tools, etc., please include them below as a numbered list)*