

What is a Horizon Scan?

The systematic search for opportunities, which are then articulated as a vision for future directions.

The 1st SCAR Antarctic and Southern Ocean Science Horizon Scan

The international Antarctic community came together to “scan the horizon” to identify the highest priority scientific questions that researchers should aspire to answer **in the next two decades and beyond.**

Country	Organization/Institution	Affiliation
USA	Department of Oceanography, Environmental Science	Immediate Past President of SCAR
USA	Geology, Geophysics	Penn State University
USA	Geology, Geophysics	University of Texas at Austin
UK	Paleoceanology	British Antarctic Survey
France	Terrestrial Ecology, Botany	Institut Polar Français Paul Emile Lillier
Chile	Paleobiology, Biogeography	Instituto Antártico Chileno
Germany	Geophysics, Ice Core Science	Alfred Wegener Institute
COMNAP	Geology, Law and Policy	COMNAP
China	Upper Atmospheric Physics	Polar Research Institute of China
Australia	Southern Ocean processes, Climatology	CSIRO Marine and Atmospheric Research

COMNAP Antarctic Roadmap Challenges Steering Committee

The 1st SCAR Antarctic and Southern Ocean Science Horizon Scan

Antarctic Atmosphere and Global Connections

Southern Ocean and Sea Ice in a Warming World

Antarctic Life on the Precipice

Antarctic Ice Sheet and Sea Level

Dynamic Earth - Probing beneath Antarctic Ice

Near-Earth Space and Beyond - Eyes on the Sky

Human Presence in Antarctica

Available at: <http://www.scar.org/horizonscanning>

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1st SCAR Antarctic and Southern Ocean Science Horizon Scan

Publications 7 August 2014

A roadmap for Antarctic and Southern Ocean science for the next two decades and beyond

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Online September 2014

Available at: <http://www.scar.org/horizonscanning>

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COMNAP
Antarctic Research Challenges Project

COMNAP ARC Workshop Writing Group Assignments

Group	Cluster	co-Lead	co-Lead	Scribe	1	2	3	4
A - Blue	Antarctic atmosphere and global connections	A. McDonald (NZ)	B. Wouding (AUS)	S. Colwell (UK)	N. Blixrud (EU)	K. Fulkner (USA)	T. Stocking (UK)	J. Casanova (USA)
B - Red	Southern Ocean and sea ice in a warming world	A. Whalen (DWE)	J. Hall (UK)	G. Wilson (ND)	M. Ojeda (SFA)	H. Lee (KOR)	A. Krigsholt (DWE)	S. Ackley (USA)
C - Yellow	Antarctic ice sheet and sea level	S. Anandakrishnan (USA)	M. Stieglitz (UK)	U. Niemann (GER)	J.G. Winder (NOR)	D. Vaughan (UK)	D. Blankenship (USA)	
D/F - Green	Dynamic Earth /Near Earth space and beyond	C. Escartin (SFA)	H. Yang (China)	T. Whisen (USA)	B. House (USA)	J. Francis (UK)	J. Goldblatt (NOR)	
E/G - Orange	Antarctic life on the precipice / Human presence	S. Chown (AUS)	T. Ennos (DWA)	D. Cowan (SAR)	M. Lopez (COMNAP)	C. Cardamone (UK)	H.C. Shin (KOR)	G. Vagstad (ND)
Unassigned	MC Kennicutt (USA)	YD Kim (KOR)	M. Rogan Finonemore (COMNAP)	J. Lopez (SAR/SFA)	K. Sharafati (COMNAP/IFN)			

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Schedule for the COMNAP ARC Workshop
23-25 August 2015, Tromsø Norway
Day 2 - Monday 24 August 2015

Time	Activities	Goal	Notes
8:45 AM - 9:00 AM	Assemble in Plenary	Answer questions, address concerns, gauge progress	Co-Chairs of ARC Project - MC Kennicutt II / YD Kim
9:00 AM-10:30 AM	Writing Groups A-E	Conclude Goals 1 and 2 discussions, begin Goal 3 - Access discussions	
10:30 AM - 11:00 AM	Coffee Break	Informal discussions	
11:00 AM - 12:30 PM	Writing groups A-E	Continue discussion of Goal 3 - Infrastructure and logistics	
12:30 PM - 2:00 PM	Lunch		Provided onsite
2:00 PM - 2:30 PM	Joint group meetings to compare notes	Compare and contrast results, discuss cross-cutting questions	Group A meets with Group B, Group C meets with Group D, Group E decides how to handle Group F input
2:30 PM - 3:00 PM	Joint group meetings to compare notes	Compare and contrast results, discuss cross-cutting questions	Group A meets with Group C, Group B meets with Group E, Group D decides how to handle Group F input
3:00 PM - 3:30 PM	Joint group meetings to compare notes	Compare and contrast results, discuss cross-cutting questions	Group A meets with Group D, Groups B, C and E meet
3:30 PM - 4:00 PM	Coffee Break	Informal discussions	
4:00 PM - 5:30 PM	Writing Group A-E re-assemble	Discuss Goal 3 and Goal 4 Summary and conclusions	
5:30 PM - 6:00 PM	Meet in plenary	Brief Group lead reports (5 minutes each)	Highlight commonalities and cross-cutting issues. Discuss next steps and answer informal discussions
6:00 PM - 7:00 PM	Dinner		

After hours - Co-Chairs and leads continue discussions and complete writing assignments as needed

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THE BLUE GROUP
Writing Group: A
Antarctic atmosphere and global connections

Workshop Goal #1 - Scientific Questions
Change in Antarctica's atmosphere over the planet's energy budget, temperature extremes, and air chemistry and circulation. How does this mean about the planetary processes. How do interactions between the atmosphere, ocean and ice control the rate of climate change? How does climate change at the pole influence global climate? How does the increasing ozone hole and rising greenhouse gas concentrations affect regional and global atmospheric circulation and other? *Revised 11/14/15 Nature COMMENT*

Workshop Goal #2 - Highest Priority Technological Advances
What are the highest priority technological needs in this cluster?
What is your estimate of the current status of the highest priority technological needs - do they exist, are they widely available, and what is the stage of and how important? See the Survey results for brief answers to be used.

Rank Order (1 is highest priority)	Confidence (H/M/L)
1	
2	
3	
4	
5	

Other comments/variances from ARC survey results

Participants and Expertise:

- A. Antarctic atmosphere and global connections (Blue Group)
- B. Southern Ocean and sea ice in a warming world (Red Group)
- C. Antarctic ice sheet and sea level (Yellow Group)
- D. Dynamic Earth - probing beneath Antarctica (Green Group)
- E. Antarctic life on the precipice (Orange Group)
- F. Near Earth space and beyond - eyes on the sky (Green Group)
- G. Human presence in Antarctica (Orange Group)

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Schedule for the COMNAP ARC Workshop
23-25 August 2015, Tromsø Norway
Day 3 - Wednesday 25 August 2015

Time	Activities	Goal	Notes
8:45 AM - 9:00 AM	Assemble in Plenary	Answer questions, address concerns, gauge progress	Co-Chairs of ARC Project - MC Kennicutt II / YD Kim
9:00 AM-10:30 AM	Writing Groups A-E	Conclude Goals 1-3 and Goal 4 Summaries	
10:30 AM - 11:00 AM	Coffee Break	Informal discussions	Coffee break dependent on progress
11:00 AM - 12:00 PM	Meet in plenary - Reports by leads (7-8 minutes each)	Discuss synthesis across Horizon Scan clusters (20 minutes)	Open discussions
12:00 PM - 12:15 PM	Next Steps/Concluding Remarks	Outline progress, remaining tasks, assignment of responsibilities and deadlines	Co-Chairs of ARC Project - MC Kennicutt II / YD Kim; Adjourn before SCAR/COMNAP Joint Ex Com meeting

After workshop close - Co-Chairs and leads continue discussions and complete writing assignments as needed

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Schedule for the COMNAP ARC Workshop
23-25 August 2015, Tromsø Norway
Day 1 - Sunday 23 August 2015

Time	Activities	Goal	Notes
1:00 PM - 1:10 PM	Welcome	Introductions and house-keeping	Co-Chairs of ARC Project - MC Kennicutt II and YD Kim; M. Rogan Finonemore
1:10 PM - 1:25 PM	Introductory Remarks	The Future of Antarctic Science, Management and Support	K. Sharafati, Chair of COMNAP
1:25 PM - 1:55 PM	Keynote - Science Perspective	What will Antarctic science look like in 20 years?	Tentative - Bill Stone (if unable to attend, time will be assigned to other Day 1 activities)
1:55 PM - 2:30 PM	Keynote - National Antarctic Programs Perspective	What will National Antarctic Programs look like in 20 years?	Jan-Gunnar Wither
2:30 PM - 3:00 PM	Charge to the workshop	Explain the process and goals, assignment of writing group members and leads	MC Kennicutt II
3:00 PM - 3:30 PM	Coffee Break	Informal discussions	
3:30 PM - 6:00 PM	Writing Group A-E	Discussions of Goal 1 - Science Objectives and Goal 2 - Technologies	Leads to discuss how the groups will accomplish their work and begin discussions
6:00 PM - 7:00 PM	Icebreaker/Light food	Informal discussions	Dinner on your own

After hours - Co-Chairs and leads continue discussions and complete writing assignments as needed

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5. Workshop Outputs

A series of outputs are planned to ensure wide and timely communication of the outcomes of the workshop. These may include, but not be limited to:

- A presentation of preliminary findings to the following: **COMNAP Annual General Meeting** depending on progress at this workshop this may be an update **and/or a discussion** of the first outputs.
- A 'glossy' workshop report that details the methods, the process and the outcomes. To be accompanied by a short 2 to 4 page glossy fold-out brochure for wide distribution to non-scientists and decision-makers (target by the end of CY2015).
- A high profile summary on par with the Horizon Scan Nature COMMENT (all attendees will be co-authors).
- A **comprehensive** record of the project in a peer-reviewed article. The initial target will be **Climate Science** to produce a companion article the "Science Roadmap" article (all attendees will be co-authors).
- Presentations at international meetings - a session at the **2015 AGU** has been approved where ARC might be presented. A companion session will be proposed for EGU in the spring of 2016.
- Presentations to individual National Antarctic Programs as requested.
- All workshop participants are encouraged to be 'ambassadors' of the project and present the outcomes as opportunities arise, especially within their own countries in first languages. All power point presentations **developed will be made widely available**.
- Continue to build the **ARC web pages on the COMNAP web site**. This site will be the archive of all ARC related materials as a companion to the Horizon Scan website at the SCAR. Link the two web sites.

The extent of follow-on activities will be determined by time availability and the resources available to conduct the publication and communication efforts.