

Academic Consortium for the 21st Century (AC21) Special Project Fund

Workshop to Develop a Collaborative Research Network and Agenda for Antarctic Tourism

FINAL PROJECT REPORT

October 2022

Project Leadership

Dr. Yu-Fai Leung, PI North Carolina State University, USA

Dr. Daniela Cajiao, Project coordinator North Carolina State University, USA

AC21 Partners

Dr. Daniela Liggett, co-Pl University of Canterbury, New Zealand

> Dr. Chengzhao Wu, co-Pl Tongji University, China

Non-AC21 Collaborators

Dr. Javier Benayas, Universidad Autónoma de Madrid, Spain
Dr. Pablo Tejedo, Universidad Autónoma de Madrid, Spain
Dr. Kees Bastmeijer, University of Groningen, the Netherlands
Dr. Karen Alexander, Heriot Watt University, United Kingdom
Dr. Hanne Nielsen, University of Tasmania, Australia
Dr. Gabriela Roldan, Antarctic Heritage Trust, New Zealand
Dr. Gunter Reck, Universidad San Francisco Quito, Ecuador



I. Abstract

With the support of the AC21 Special Project Fund, this project formed a core research team with eleven researchers from eight academic institutions (including three AC21 Partners) in eight countries to examine the state of research on Antarctica tourism and key research needs. Through this project, we have contributed to the formation of the Antarctic Tourism Action Group (Ant-TAG) under the Scientific Committee on Antarctic Research (SCAR), a new platform to foster further collaboration beyond the AC21 project period. We have also facilitated multiple short-term collaborations that resulted in conference presentations, peer-reviewed publications, and grant proposals. Using online meetings and hybrid workshops, we were able to engage a wider community of Antarctic and protected area researchers and professionals in a Horizon Scan process to identify Antarctic tourism research needs and their priorities for the next 3-5 years.

II. Introduction

Antarctica, the last frontier on earth, is witnessing drastic changes in recent decades due to a variety of global and regional forces such as climate change, fisheries, introduced species, and tourism. The Antarctic Peninsula, for example, is one of the fastest warming regions in the world. Yet, this region accommodates the vast majority of Antarctic tourism operations and activities, which has been steadily increasing and quickly diversifying in terms of tour itineraries and characteristics.

There has been a modest level of research attention devoted to Antarctic tourism, including ecological effects, tourist experiences, sustainable management, and governance and policies. However, this body of research is highly fragmented (Stewart et al., 2017). There remains wide knowledge gaps on many fronts of Antarctic tourism as research efforts are not commensurate with the pace of changes. Filling these key knowledge gaps will inform sustainable management of Antarctic tourism to maximize its positive impacts while minimizing the negative ones. This is a significant undertaking that will only be possible with a strong and sustained network of active researchers collaborating on prioritized research needs.

The AC21 Special Project Fund provides a unique and timely opportunity for convening scholars from AC21 partner institutions with complementary expertise to examine the state of research on Antarctica tourism and key research priorities. The overall goal of this project was to build a community of researchers who collaborate to tackle high-priority knowledge gaps that inform sustainable management of Antarctic tourism. Specific objectives were:

A) To build a collaborative research network on Antarctic tourism;

B) To facilitate short-term collaborations, and

C) To develop a proposed research agenda with community participation through a workshop and online exchange.

Due to the unprecedented disruptions of COVID-19 pandemic, many planned activities supportive of project objectives were delayed between 2020 and 2021. Two project extensions were requested and approved with the current end date of September 30, 2022. With the extended timeline, the project team were able to perform all project activities and accomplish the project objectives, as summarized in the following sections.

III. Project Activities

During the project period, including its extensions, a total of 12 virtual meetings were held with the project team members. At the initial meetings, potential members for the collaborative research network on Antarctic tourism (CRNAT) were identified and invited to join this initiative, resulting in an 11-member CRNAT core team. At subsequent meetings, the core team identified, aligned, and prioritized research interests and needs through different conceptual exercises. Members of the CRNAT also presented their initiatives on different research topics and interests which resulted in short-term collaborations with specific outputs. At least three virtual meetings were conducted to get specific input from the members, especially for organizing the methods and workshops for developing the Horizon Scan surveys. At the final meetings, the core team met to discuss the Horizon Scan methodology and survey results.

· - ·		
Topic	Activities	Outputs
Visibility of the project	Once the project was approved, an online profile was created on ResearchGate to facilitate information regarding the aims of the project and the contacts of the members.	ResearchGate project profile: [https://www.researchga te.net/project/AC21- Antarctic-Tourism- Research-Project]
Adding collaborators to the project	Soon after the inception of the project (with four members), we established contact with other researchers interested and invited them to join the core team.	The project counted a total of 11 core team members representing eight universities from eight countries.
Communicating and reporting progress	During the project, oral presentations at two international conferences were made for communicating and presenting the progress of the project to the Antarctic research community.	Presentation at the SCAR SC-HASS Conference. Kobe, Japan, November 2021 (virtual) Academic Consortium 21 (AC21) A Collaborative Approach to Developing a Research Agenda for Antarctic Tourism. Presentation and the 10 th SCAR Open Science Conference.

A. Build a collaborative research network

Collaborative	To foster further collaborations and engage a	India, August 2022 (virtual) Academic Consortium 21 (AC21) A Collaborative Approach to Developing a Research Agenda for Antarctic Tourism. Contributed to the
network beyond this AC21 project	larger community, four project collaborators in this project team developed a proposal to form the Antarctic Tourism Action Group (Ant- TAG) under the Scientific Committee on Antarctic Research (SCAR). This proposal was endorsed by SCAR's Standing Committee on Humanities and Social Sciences (SC-HASS) and approved by SCAR in 2021. This new action group was introduced to the 44 th Antarctic Treaty Consultative Meeting (ATCM) in Berlin, Germany in May 2022.	formation of the Antarctic Tourism Action Group (Ant-TAG). All of the four co-leads of the Ant-TAG are collaborators of this AC21 project.
AC21 Panel session	Held at the virtual SCAR SC-HASS Biennial Conference in November 2021. The purpose was to present the progress and future activities of the project. Five presentations were developed, and a plan for the Horizon Scan process was presented.	Hybrid panel session of the project.

B. Facilitate short-term collaborations

Торіс	Activities	Output
Understanding	As part of the short-term	Manuscript reporting the survey results
Chinese tourism in the Antarctic	collaborations, a pilot survey of Antarctic Chinese tourists was	in preparation for submission.
	conducted to better understand their perceptions, preferences and experiences.	A peer-reviewed article was published: Wu, C. et al. In Press. The international agreement on the development and management of
	A manuscript on international regulations of Antarctic tourism was developed.	global Antarctic tourism (in Chinese). Ocean Development and Management. This paper was presented to the Chinese Polar Program.
		Presentation at the SC-HASS Biennial Conference. Kobe, Japan, November 2021 (virtual).
The status of knowledge and practice of	An appraisal of the different management instruments and concepts applied to Antarctic	A peer-reviewed article was published: Cajiao et al., 2021. Adaptive management of sustainable tourism in

adaptive	tourism was completed with the	Antarctica: A rhetoric or working
Antarctic tourism	involvement of four members of the CRNAT. Results of this paper were presented at two international meetings.	progress? Sustainability, 13(14), Art. 7649. https://doi.org/10.3390/su13147649
	, , , , , , , , , , , , , , , , , , ,	Presentation at the SCAR SC-HASS Biennial Conference. Kobe, Japan, 2021 (virtual).
		Presentation and the 10 th SCAR Open Science Conference. India, August 2022 (virtual).
The state of research on environmental impacts of Antarctic tourism	A review of the environmental tourism impacts in Antarctica was completed during the project period. This involved the collaboration of five members of the CRNAT. Results were published in a peer-reviewed journal and presented at two international meetings.	A peer-reviewed article was published: Tejedo et al., 2022. What are the real environmental impacts of Antarctic tourism? Unveiling their importance through a comprehensive meta- analysis. <i>Journal of Environmental</i> <i>Management, 308</i> , Art. 114634. <u>https://doi.org/10.1016/j.jenvman.2022.</u> <u>114634</u> Presentation at the SCAR SC-HASS
		Biennial Conference. Kobe, Japan 2021 (virtual).
		Presentation and the 10 th SCAR Open Science Conference. India, August 2022 (virtual).

C. Develop a proposed research agenda through community participation

Торіс	Activities	Output
Identify	For identifying the different research needs and	Handout with a
research	gaps regarding Antarctic Tourism a community	preliminary prioritization of
needs and	exercise was conducted. For this, subgroups	research needs and
gaps for	were organized according to shared interests.	interests.
Antarctic	The Concept Board online tool was used for	
tourism	gathering and organizing the different ideas. In	Four concept boards
	the end, three different concept boards were	outputs contain the
	produced, and one compromised version was	different perspectives and
	created. This concept board was the base for	research needs among
	organizing the Horizon Scan exercise.	researchers
Horizon Scan	After deliberation with the members, a	Hybrid workshop held in
of Antarctic	methodology for the Horizon Scan was	Potsdam, Germany, May
Tourism	determined. It includes two stages of	2022.
	community participation.	
		Two Horizon Scan
		surveys completed with

The first stage consisted of a Qualtrics survey	two survey databases
to identify tourism research questions among a broader spectrum of participants involved in nature tourism, protected areas, and polar tourism. Results of the first survey were reviewed and consolidated using a hybrid workshop held in Potsdam, Germany, May 2022. This event counted a total of 15 participants.	compiled. Results have been analyzed and are being disseminated in forms of journal manuscripts, an ATCM management document, and conference presentations.
At the second stage, another Qualtrics survey on the prioritization of research topics and questions was launched. A total of 82 responses were collected. Data analyses are complete with manuscript being developed. Results will allow the development of two peer- reviewed manuscripts.	
Additionally, one management document is expected to be presented at the 45th Antarctic Treaty Consultative Meeting (ATCM) in Helsinki, Finland, June 2023. An abstract for an oral presentation will be submitted for the SC- HASS Biennial conference, Portugal 2023.	

IV. Achievements and Outcomes

This project has provided an excellent opportunity to engage interested researchers and practitioners in a variety of project activities through different channels, including online collaborative tools (e.g., Concept Boards, MURAL), virtual meetings, hybrid workshops, and community surveys. Building upon the three AC21 institutions, NC State, Canterbury, and Tongji, the project brought together a core team, some of whom had not collaborated prior to the project. Through this project experience, our core team fully expects to continue and expand their collaboration well beyond the project completion, through the Ant-TAG and other platforms. For example, building on the spirit of collaboration through this project, our team members were engaged in grant proposal development for the Spanish and Dutch Antarctic research programs. Three Dutch proposals were approved for funding in July 2022.

Another major achievement of this project is a research agenda for Antarctic tourism through a participatory process, involving both the core project team and a broader community with expertise on tourism research in Antarctica and other protected areas. Through the two-stage Horizon Scan process, we were able to identify the top-priority research topics and questions for Antarctic tourism in the next 3-5 years. While some research topics have been advocated by individual researcher, through this project, the urgency of these topics/questions was validated by the Horizon Scan results. We believe that this research agenda will catalyze the discourse on

Antarctic tourism, stimulate collaborative research in the near future, and inform priorities of funding support from the industry, scientific organizations (e.g., SCAR, SC-HASS), National Antarctic Programs, and the ATCM at large.

Our AC21 project has also received a number of recognitions. These include mentions of this project in an Information Paper (IP 75) submitted to 44th Antarctic Treaty Consultative Meeting (ATCM) in Berlin, Germany. Our team member Dr. Chengzhao Wu was also invited to present this project and the associated studies at the Chinese Arctic and Antarctic Administration's Headquarters in Shanghai, China.

V. Conclusion

In conclusion, the project team is most grateful for the financial support from the Academic Consortium 21 and their gracious extensions of project timelines. We have achieved our project objectives and made significant advancements toward the ultimate goal. We have contributed: 1) to research on Antarctic tourism through our presentations and publications, 2) to the Antarctic tourism community by offering a proposed research agenda for the next 3-5 years, and 3) to AC21's vision of promoting of cooperation in education and research between members, the bridging between different societies in the world and the delivering of wisdom to all people to mutually understand and share values, knowledge and cultures necessary to improve quality of life and to foster co-existence beyond national and regional boundaries in the 21st century. We believe that polar issues will continue to evolve and research collaborations are much needed to inform policy and management decisions for these global commons. We hope that AC21 will continue to support funding proposals on Antarctic or polar topics which will likely lead to fruitful outcomes.

VI. Achievements made within SPF collaboration

Several of the AC21 partners and non-AC21 collaborators of this project collaborated in a number of grant proposals, three of which were approved by the Dutch Research Council for funding in July 2022. These proposals are entitled: 1) Antarctic tourism - developing knowledge and tools to minimize cumulative impacts on biodiversity and wilderness values in Antarctica, 2) Fostering environmental stewardship among Antarctic tourism governance actors and institutions, and 3) Growing understanding of individual drivers of expectations and behaviours to enhance sustainable tourism in the Antarctic.

Two peer-reviewed journal articles have resulted from the short-term collaborations:

Cajiao, D., Benayas, J., Tejedo, P., & Leung, Y.-F. (2021). Adaptive management of sustainable tourism in Antarctica: A rhetoric or working progress? Sustainability, 13(14), Art. 7649. doi:10.3390/su13147649.

Tejedo, P., Benayas, J., Cajiao, D., Leung, Y.-F., De Filippo, D., & Liggett, D. (2022). What are the real environmental impacts of Antarctic tourism? Unveiling their importance through a comprehensive

meta-analysis. Journal of Environmental Management, 308, Art. 114634. doi: 1016/j.jenvman.2022.114634.

Several more manuscripts, including the one reporting the Antarctic tourism research agenda, are being prepared for submission.

VII. Budget Summary

Submitted as a separate document.

VIII. Appendices (including Photos and Links)



Dr. Yu-Fai Leung



Dr. Daniela Liggett



A. Project team members

Dr. Chengzhao Wu



Dr. Daniela Cajiao



Dr. Javier Benayas



Dr. Pablo Tejedo



Dr. Kees Bastmeijer



Dr. Karen Alexander



Dr. Hanne Nielsen



Dr. Gabriela Roldan



Dr. Gunther Reck



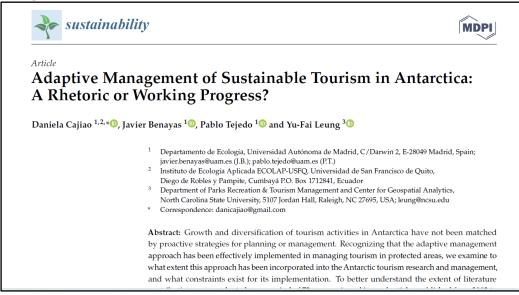
B. AC21 Antarctic Tourism Research Project Webpage on Research Gate

[https://www.researchgate.net/project/AC21-Antarctic-Tourism-Research-Project]

C R AC21 ANTARCTIC TOURISM RESE × +				-	o ×
\leftarrow \rightarrow C \textcircled{a} $\textcircled{https://www.re}$	searchgate.net/project/AC21-Antarctic-Tourism-Research-Project	A Q 6 差	📄 🥔 🔼	\$ ≤ ⊕	• ···
When tourism meet 🗧 PANORAMA PAN 🇧	Explorer Building Bl 😑 Manual de PANOR 🕚 Explore the World's.	🔿 Countries 🔞 INDC -	Submissions 💮 Expl	ore the World's 🛞 /	Areas >
ResearchGate Search for publications, researchers	, or questions Q or Discover by subject area			Join for free	Log in
Project		Updates	(0 new) 1		
AC21 Antar	ctic Tourism Research Project	Recommendations	(0 new) 0		
🐞 Yu-Fai Leung -	😵 Daniela Liggett · 🎯 Javier Benayas · <u>Show all 11 collaborators</u>	Followers	(0 new) 15		
a research agenda	a collaborative research network and engage other researchers in developing a for Antarctic tourism. This project is supported by the Special Project Fund of sortium for the 21st Century (AC21)	Reads 🛈	(0 new) 180		
	Show details				
Project log	References (31)		Follow		
	Research referenced in this	project			
	What and who is an Antarctic ambassador?				
	Article May 2020				
	🌒 Karen A Alexander · 🎲 Daniela Liggett · 🌍 Elizabeth Leane · [] · 🔘 Marcus	Haward			
	View	13 Citations			
	The evolution of polar tourism scholarship: research themes, network	s and agendas			
	Article Full-text available - Jan 2017 - Polar Geography				
ES Spanish (Latin America) 🛛 👸 Latin American	🍟 Emma J. Stewart - 🍘 Daniela Liggett - 🏀 Jackie Dawson				-

C. Publication's screenshots

Cajiao, D., Benayas, J., Tejedo, P., & Leung, Y.-F. (2021). Adaptive management of sustainable tourism in Antarctica: A rhetoric or working progress? *Sustainability*, *13*(14), Art. 7649. https://doi.org/10.3390/su13147649

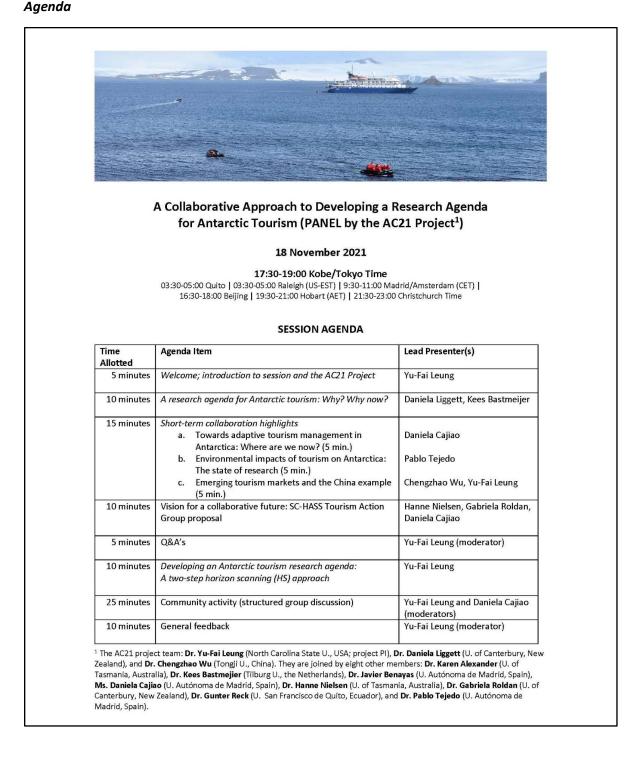


Tejedo, P., Benayas, J., Cajiao, D., Leung, Y.-F., De Filippo, D., & Liggett, D. (2022). What are the real environmental impacts of Antarctic tourism? Unveiling their importance through a comprehensive meta-analysis. *Journal of Environmental Management, 308*, Art. 114634. https://doi.org/10.1016/j.jenvman.2022.114634

	Journal of Environmental Management 308 (2022) 114634	
2011/2011	Contents lists available at ScienceDirect	
201	Journal of Environmental Management	Environmental Management
ELSEVIER	journal homepage: www.elsevier.com/locate/jenvman	
their importance P. Tejedo ^{1,*} , J. Bena ^a Grupo de Investigación ECOPOLA Madrid, Spain ^b Instituto de Ecología Aplicada ECC ^a Department of Parka, Recreation de USA ^a Laboratorio de Estudios Métricos d Spain ^a Recearch Institute for Higher Educ	Al environmental impacts of Antarctic tourism? Unveiling e through a comprehensive meta-analysis yas ^a , D. Cajiao ^{a, b} , YF. Leung ^c , D. De Filippo ^{d, e} , D. Liggett ^f - Biologia y Ecologia en Ambientes Polares, Departamento de Ecologia, Universidad Autónoma de Madrid, C/Darwin 2, E-28049, LAP-USPQ, Universidad de San Prancisco de Quito, P.O. Box 1712041, Diego de Robles y Pampite, Cambayá, Ecuador Tourism Management and Center for Geospatial Analysec, North Carolina State University, 5107 Jordan Hall, Raleigh, NC, 27695, 21 la Información (LEM), Departamento de Biblioteconomía y Documentación, Universidad Carlos III de Madrid, E-28903, Getafe, atonethur, Private Bar 4900, Critenturcha, 9140, Nov Zealand	Chargh Car population
ARTICLE INFO	A B S T R A C T	
Keyword: Bibliometric analysis Cumulative impacts Monitoring Adaptive Management Startegic conservation Natural protected areas	Human activities in Antarctica were increasing before the COVID-19 pandemic, and texception. The growth and diversification of Antarctic tourism over the last few decades his studied. However, environmental impacts associated with this activity have received less increasing body of scholarchip examining environmental issues related to Antarctic tourism important research questions, the potential negative effects of tourist visits in Antarctica as cussed by Antarctic Treaty Consultative Parties. This study presents the results of a meta-analysis of scholarly publications that synthesic current knowledge of environmental impacts resulting from Antarctic to a gene content analysis. Further, an in deebt content analysis are compiled and subjected to a gene content analysis.	ave been extensive attention despite a h. Aside from raisin re also an issue d zes and updates o publication databa ral bibliometric an

D. Organized sessions and presentations at conferences

1. SCAR, SC-HASS Biennial Conference. Kobe, Japan, 18 November 2021. AC21 Project Panel Session.



Introduction to the SC-HASS Panel Session



18 November 2021

Why do we need a research agenda for Antarctic tourism?

A Collaborative Approach to Developing a Research Agenda for Antarctic Tourism



SC-HASS Conference PANEL (18 Nov. 2021)



Adaptive management of Sustainable Tourism in Antarctica.



Adaptive Management of Sustainable Tourism in Antarctica:

A RHETORIC OR WORKING PROGRESS?

<u>Daniela Cajiao</u>, Javier Benayas, Pablo Tejedo & Yu-Fai Leung

Kobe, November 18th, 2021

Environmental impacts of Antarctic tourism



Antarctic tourist visitation trends, emerging markets, and the China example



¹ Tongji University, China ² North Carolina State University, USA 18 November 2021

🕓 AC 21 Project

SCAR Tourism Action Group (ANT-TAG)



University of Tasmania (Australia)

Universidad Autónoma de Madrid (Spain), (New Zealand)

Universidad de San

Francisco de Quito (Ecuador)

(New Zealand)

North Carolina State University (USA)

18 November 2021

Developing an Antarctic tourism research agenda.



Project PI: Yu-Fai Leung Project Co-Investigators: Daniela Liggett, Chengzhao Wu Project Team: Karen Alexander, Kees Bastmejier, Javier Benayas, Daniela Cajiao, Hanne Nielsen, Gabriela Roldan, Gunter Reck, Pablo Tejedo 2. SCAR Open Science Conference. August 2022. Organized session: The changing face of Antarctic Tourism.



Adaptive Management of Sustainable Tourism in Antarctica. A rhetoric of working progress?

The Antarctic Tourism "Anthropause": What's next?



Unveiling the real and potential environmental impacts of Antarctic tourism through a comprehensive meta-analysis of the published research



10th SCAR Open Science Conference— 4 August 2022

3. A collaborative approach to developing a research agenda for Antarctic tourism: A hybrid workshop. May 29th, 2022. Potsdam, Germany.

Agenda

Academic Consortiu		
AC	Academic Consortium 21 (AC21) Projec ollaborative Approach to Developing a Research Agenda	
	Sunday, 29 May 2022, 10:00-16:00 Central Eu	ropean Time
JOIN IN P	ERSON: Raum 4-24a, Volmer, <u>Wissenschaftsetage</u> , Am Kanal JOIN ONLINE VIA ZOOM <u>https://ncsu.zoom.us/j/9</u>	
	Meeting Co-hosts:	
D	Pr. Yu-Fai Leung (Project PI), North Carolina State University, U.	S.A., <u>Leung@ncsu.edu</u>
Dr. Daniela	Liggett (Project co-PI), University of Canterbury, New Zealand,	daniela.liggett@canterbury.ac.nz
	FINAL MEETING AGENDA	
	FINAL MEETING AGENDA	
Time	Agenda Item	Presenter(s)/ Moderator(s)
10:00-10:15	A. Welcome, Introductions, AC21 Project Overview	Daniela Liggett & Yu-Fai Leung
10:15-11:45	B. Developing a Research Agenda for Antarctic Tourism	
	1. Research needs conceptual models from the <u>AC21 core</u> <u>team</u>	Yu-Fai Leung, Pablo Tejedo & Daniela Cajiao
	 Community input: Highlights of Mural exercise; AC21 Horizon Scan 1st survey preliminary results 	Daniela Cajiao & Yu-Fai Leung
	그 것 같은 것 같	Daniela Cajiao & Yu-Fai Leung Yu-Fai Leung, Daniela Liggett &
	 Horizon Scan 1st survey preliminary results 3. Next steps and final outputs Synthesis/prioritization of research needs 	
	 Horizon Scan 1st survey preliminary results 3. Next steps and final outputs Synthesis/prioritization of research needs SCAR Open Science Conference 	Yu-Fai Leung, Daniela Liggett &
11:45-13:00	 Horizon Scan 1st survey preliminary results 3. Next steps and final outputs Synthesis/prioritization of research needs 	Yu-Fai Leung, Daniela Liggett &
11:45-13:00	 Horizon Scan 1st survey preliminary results Next steps and final outputs Synthesis/prioritization of research needs SCAR Open Science Conference Project outputs and collaborative opportunities 	Yu-Fai Leung, Daniela Liggett &
11:45-13:00	Horizon Scan 1st survey preliminary results 3. Next steps and final outputs Synthesis/prioritization of research needs SCAR Open Science Conference Project outputs and collaborative opportunities C. Collaborative Fronts Spanish and Dutch research proposals: Overview and 	Yu-Fai Leung, Daniela Liggett & Chengzhao Wu (moderators) Kees Bastmeijer, Javier Benayas
11:45-13:00	 Horizon Scan 1st survey preliminary results Next steps and final outputs Synthesis/prioritization of research needs SCAR Open Science Conference Project outputs and collaborative opportunities C. Collaborative Fronts Spanish and Dutch research proposals: Overview and collaborative opportunities The SCAR Tourism Action Group (Ant-TAG): Overview and 	Yu-Fai Leung, Daniela Liggett & Chengzhao Wu (moderators) Kees Bastmeijer, Javier Benayas & Machiel Lamers Hanne Nielsen, Gabriela Roldan,
11:45-13:00	 Horizon Scan 1st survey preliminary results Next steps and final outputs Synthesis/prioritization of research needs SCAR Open Science Conference Project outputs and collaborative opportunities C. Collaborative Fronts Spanish and Dutch research proposals: Overview and collaborative opportunities The SCAR Tourism Action Group (Ant-TAG): Overview and collaboration opportunities Other collaborative fronts, including writing project updates Lunch at a nearby restaurant (at your opportunity opportunit	Yu-Fai Leung, Daniela Liggett & Chengzhao Wu (moderators) Kees Bastmeijer, Javier Benayas & Machiel Lamers Hanne Nielsen, Gabriela Roldan, Daniela Cajiao & Yu-Fai Leung Yu-Fai Leung & Daniela Liggett (moderators) wn cost)
	 Horizon Scan 1st survey preliminary results Next steps and final outputs Synthesis/prioritization of research needs SCAR Open Science Conference Project outputs and collaborative opportunities C. Collaborative Fronts Spanish and Dutch research proposals: Overview and collaborative opportunities The SCAR Tourism Action Group (Ant-TAG): Overview and collaboration opportunities Other collaborative fronts, including writing project updates 	Yu-Fai Leung, Daniela Liggett & Chengzhao Wu (moderators) Kees Bastmeijer, Javier Benayas & Machiel Lamers Hanne Nielsen, Gabriela Roldan, Daniela Cajiao & Yu-Fai Leung Yu-Fai Leung & Daniela Liggett (moderators)

Potsdam Workshop photo



E. Team's Zoom meetings and initial conceptual outputs from the Horizon Scan exercise





