Research Ideas and Outcomes 11: e152859
doi: 10.3897/rio.11.e152859

Workshop Report

Ecology for a social revolution: Re-defining the role of ecological and environmental science professionals and their responsibilities towards society

Florencia A Yannelli[‡,§,|], Kristiina Visakorpi[¶], Anni Arponen[#], Carlos Alberto Arnillas[¤], Javiera Beatriz Chinga Chamorro[«], Mariana C. Chiuffo[»], Sharon K. Collinge[˄], Roger Cousens[˅], Kadambari Devarajan[¦], Ken Ehrlich[ˀ], marilyn grell-brisk[ˁ], Rebecca W. Kariuki[₵], Heather M. Kharouba[ℓ], Andrea Monica D. Ortiz[₰], Ana Carolina Prado-Valladares[₱], Helen Regan[₳], Florian Schnabel[₴], Bruno E. Soares[₣], Gisela C. Stotz[₮], Michael Williams[₦], Marc W. Cadotte[₭]

‡ Argentine Institute for Dryland Research (IADIZA), CONICET and Universidad Nacional de Cuyo, Mendoza, Argentina
§ Freie Universität Berlin, Berlin, Germany
| Leibniz-Institute of Freshwater Ecology and Inland Fisheries (IGB), Berlin, Germany
¶ Department of Biology, Norwegian University of Science and Technology, Trondheim, Norway
# Department of Biology, University of Turku, Turku, Finland
¤ Department of Physical and Environmental Sciences, University of Toronto Scarborough, Toronto, Canada
« Escuela de Ingeniería en Medio Ambiente y Sustentabilidad, Universidad Mayor, Santiago, Chile
» Grupo de Ecología de Invasiones, INIBIOMA, Universidad Nacional del Comahue, CONICET, Bariloche, Argentina
˄ Arizona Institute for Resilience, Tucson, United States of America
˅ University of Melbourne, Melbourne, Australia
¦ Department of Natural Resources Science, College of Environment and Life Sciences, University of Rhode Island, Kingston, United States of America
ˀ Roski School of Art and Design, University of Southern California, Los Angeles, United States of America
ˁ Organizational Studies Field Group, Pitzer College, Claremont, United States of America
₵ School of Sustainability, College of Global Futures, Arizona State University, Tempe, United States of America
ℓ Department of Biology, University of Ottawa, Ottawa, Canada
₰ Departamento de Geografía, Facultad de Arquitectura, Urbanismo y Geografía, Universidad de Concepción, Concepcion, Chile
₱ Fundação Instituto de Pesca do Estado do Rio de Janeiro, Rio de Janeiro, Brazil
₳ Department of Evolution, Ecology, and Organismal Biology, University of California Riverside, Riverside, United States of America
₴ Institute of Forest Sciences, Faculty of Environment and Natural Resources, University of Freiburg, Freiburg, Germany
₣ Institute of Environmental Change & Society, University of Regina, Regina, Canada
₮ Centro de Investigación para la Sustentabilidad, Facultad de Ciencias de la Vida, Universidad Andrés Bello, Santiago de Chile, Chile
₦ Michael Williams & Associates Pty Ltd, Sydney, Australia
₭ Department of Biological Sciences, University of Toronto – Scarborough, Toronto, Canada

© Yannelli F et al. This is an open access article distributed under the terms of the Creative Commons Attribution License (CC BY 4.0), which permits unrestricted use, distribution, and reproduction in any medium, provided the original author and source are credited.

Corresponding author: Florencia A Yannelli (florenciayannelli@gmail.com)

Reviewable v 1

Received: 12 Mar 2025 | Published: 07 May 2025

Citation: Yannelli F, Visakorpi K, Arponen A, Arnillas C, Chinga Chamorro J, Chiuffo MC, Collinge SK, Cousens R, Devarajan K, Ehrlich K, grell-brisk marilyn, Kariuki RW, Kharouba HM, Ortiz AMD, Prado-Valladares A, Regan H, Schnabel F, Soares BE, Stotz GC, Williams M, Cadotte MW (2025) Ecology for a social revolution: Re-defining the role of ecological and environmental science professionals and their responsibilities towards society. Research Ideas and Outcomes 11: e152859. https://doi.org/10.3897/rio.11.e152859

Abstract

The sixth mass extinction and the ongoing biodiversity and climate crises demand urgent action from ecologists and environmental scientists (EESs). Despite their critical role in addressing these challenges, EESs face unclear professional responsibilities towards society, local communities and ecosystems. The 2024 ANdiNA workshop was held in Conguillío National Park in Chile, within Wallmapu the ancestral land of the Mapuche people. It gathered global EESs to explore the roles, obligations and accountability of professionals in this field. The discussions focused on the evolving responsibilities of EESs amidst the environmental crises, as well as the need for clearer frameworks to guide their actions.

Key questions included the scope of EESs' professional activities, how their obligations should adapt during times of crisis and whether they should be held accountable for scientific mistakes that lead to negative societal outcomes. The workshop explored the potential for creating a codified framework, such as an oath or manifesto, to clarify EESs' professional responsibilities. Participants highlighted the importance of integrating financial, intellectual, ethical and institutional dimensions in defining these roles, particularly in how EESs engage with local communities and society.

Emerging themes included the need for a shared framework to align EESs' actions, exemplified by the *Conguillío Statement*, which encourages collaboration, inclusivity and ethical engagement with communities, especially Indigenous ones. The workshop also emphasised the importance of solution-orientated, transformative research and advocacy, calling for a shift in how EESs approach their roles as agents of change. By critically reflecting on their responsibilities, the workshop provided a foundation for re-imagining the role of EESs in the face of global environmental crises, urging systemic, collaborative approaches to safeguarding both nature and humanity.

Keywords

ecological practices, environmental crisis, meaningful science, professional responsibility, social-ecological systems, walkshop

Date and place

19 - 23 February 2024, Conguillio National Park, Chile

List of participants

Anni Arponen; Carlos Alberto Arnillas; Marc Cadotte; Javiera Beatriz Chinga Chamorro; Mariana Chiuffo; Sharon Collinge; Roger Cousens; Kadambari Devarajan; Ken Ehrlich; marilyn grell-brisk; Lesley Hughes; Rebecca Kariuki; Heather Kharouba; Alexandra-Maria Klein; Tara Martin; Toni Lyn Morelli; Hazel Norman; Monica Ortiz; Aníbal Pauchard; Ana Carolina Prado-Valladares; Helen Regan; Libby Rumpff; Florian Schnabel; Bruno Soares; Gisela Stotz; Kristiina Visakorpi; Marten Winter; Florencia A. Yannelli.

Michael Williams, independent pro-bono workshop facilitator.

Introduction

We are going through the sixth mass extinction and facing the consequences of biodiversity loss (IPBES 2019). Our natural world has not faced a crisis of comparable magnitude in more than 60 million years. As professional ecologists and environmental scientists (EESs), it has become impossible to ignore the cascading environmental emergencies and the political decisions driving them. Eco-social well-being, a combination of planetary health, cooperation and justice resulting in human holistic prosperity, is one of the most urgent challenges of our time. EESs are uniquely positioned to guide action, driven by a shared belief in the necessity and value of their contributions to safeguarding the planet's future. However, it remains unclear how EESs can effectively bridge the gap between knowledge and action in the communities and ecosystems they work in. Additionally, it is uncertain how they can undertake their various roles within these communities to drive meaningful change.

By the very nature of their training, funding and employment, EESs are intricately connected to, and, in essence, indebted to, the communities they work in. This connection should shape their sense of professional responsibilities (Bird 2014). For example, there have been important shifts towards data accessibility and permanent data repositories, including greater demand for and access to open access publications. These are partly driven by the principle that those who ultimately fund research (i.e. taxpayers) should have the ability to access and assess the research they support. This approach ensures a legacy and continuity on which to build future discoveries. Moreover, it is founded on the premise that knowledge should be accessible to everyone, thereby fostering the advancement of science (Suber 2006, Foundation 2023).

While the importance of research and project accessibility is now widely accepted, how EESs should navigate broader societal responsibilities and obligations remains unclear. The boundaries of these responsibilities are also ambiguous, as unlike many other fields,

EESs often lack codified principles that define their values and responsibilities across their diverse roles. For instance, medical professionals adhere to established ethical frameworks, such as the modernised Hippocratic Oath or the Declaration of Geneva, which guide decisions and reflect contemporary values (Parsa-Parsi 2017). The absence of similar frameworks for EESs can lead to misunderstandings and conflicts in their professional practice, particularly when working with or as members of environmentalist organisations, government agencies, NGOs or industry. This lack of clarity may result in less impactful or ineffective outcomes and, in some cases, even legal consequences (Fraser 2017, Tollefson and Mega 2017). National and international ecological societies are well-positioned to address this gap by developing explicit values and actionable guidelines for their members. Establishing these frameworks and aligning them with global environmental challenges would significantly enhance the capacity of EESs to effectively address critical issues.

Defining the values and responsibilities of EESs across the diverse possible roles is inherently complex, especially when considering the blurred boundaries between professional obligations to society and personal activism. It also remains unclear whether these can, or even should, be distinctly separated. EESs can affect the environment in various ways depending on their role and their work can be influenced by the environment as well. They also operate in numerous capacities and engage with a wide array of stakeholders on critical issues. These interactions occur through diverse pathways, including collaborating with practitioners such as land managers, informing or acting as policy-makers, developing educational programmes, working in academic institutions, interacting with the media and participating in advocacy or activism (Fig. 1). Such varied roles highlight the need to evaluate the obligations of EESs across financial, intellectual, ethical and institutional dimensions. Financially, society's investment in training, employing and funding ecological and environmental research creates an implicit responsibility for EESs to effectively communicate critical issues to the public. Intellectually, as experts with specialised knowledge of ecological and environmental systems, EESs are often seen as having a duty to educate, correct misconceptions and guide public perception and policy decisions. Ethically, their dedication to understanding and managing natural and human-modified ecosystems suggests a leadership role in efforts to minimise harm and promote environmental sustainability. Together, these interconnected dimensions underscore the complexity of defining the responsibilities of EESs in addressing global environmental crises.

To address this issue, a diverse group of EESs gathered at the 2024 ANdiNA workshop in Conguillío National Park, located in the Andean Region of the Araucanía in Chile, within the Wallmapu, ancestral land of the Mapuche people. This Park is home to the sacred Pewen tree (*Araucaria araucana*), with which the Mapuche maintain a dynamic and evolving relationship, shaped by a complex blend of ecological, social and cultural factors (Ibarra et al. 2022). Given its significance, the Park provided an ideal setting to discuss and debate the responsibilities of EESs towards society in general and local communities such as the one hosting us, within the context of the ongoing environmental crises. The workshop centred around what the organising committee called "the big

question": What are the obligations, responsibilities and accountabilities of EESs in their different roles towards both society and nature? From this, three more specific questions emerged, which were presented to participants:

1. What is the span of activities that professionals in the field of ecology should engage in as part of their purported mission to fulfil their professional and social obligations?
2. Do these obligations remain the same now that we are facing the climate and biodiversity crises or do times of emergency call for re-definition of our obligations and responsibilities to the society?
3. Should EESs be liable for mistakes, biases and scientific malpractices which lead to wrong policies, management or information to the public?

Aims of the workshop

At the 2024 ANdiNA meeting, EESs from around the world, primarily from academia, gathered to engage in discussions over the questions presented. In the discussions, the participants aimed to:

- Identify the current obligations of EESs professionals and explore how these responsibilities should evolve in response to the ongoing environmental crisis.
- Revisit the history of social responsibility within the EESs field by addressing questions such as: How far have we come from the view of EESs, mostly scientists, as detached from society?
- Discuss whether EESs professionals need a clearer framework for defining their responsibilities, such as an oath or manifesto, to guide their actions in this critical time.
- Debate whether scientists in the field of ecology should be held accountable for failing to fulfil their obligations and responsibilities and explore what such accountability would look like in practice.

Organising Committee

Kristiina Visakorpi - Norwegian University of Science and Technology - Co-chair

Florencia Yannelli - IADIZA, CONICET Mendoza, Argentina, Leibniz Institute of Freshwater Ecology and Inland Fisheries, and Freie Universität Berlin, Germany - Co-chair

Marc Cadotte - University of Toronto, Scarborough, Canada

Helen Regan - University of California-Riverside, Sacramento, USA

Monica Ortiz - Institute for Ecology and Biodiversity, Conception, Chile

Mariana Chiuffo - INIBIOMA, CONICET, Bariloche, Argentina

Facilitator - Michael Williams, Michael Williams & Associates Pty Ltd, Sydney, Australia

Coordinator, secretary, treasurer - Roger Cousens, The University of Melbourne, Melbourne Australia

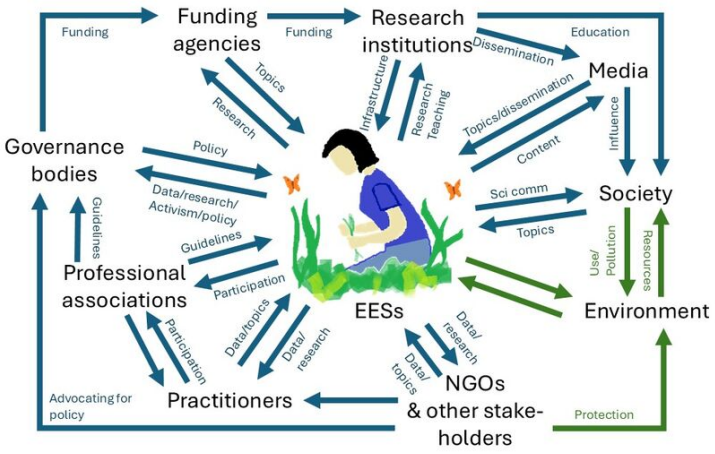

Figure 1. doi

Key institutions where professional ecologists and environmental scientists (EESs) can play vital roles, alongside major stakeholders with whom they engage. The diagram also includes the environment, which is not a stakeholder, but a critical factor influencing and influenced by these interactions. Arrows represent simplified directions of interaction for clarity, highlighting pathways through which ecologists and environmental scientists contribute to and collaborate with these entities. Blue represents interactions with key institutions and stakeholders, while green represents interactions with the environment. The term topics here can represent themes for research either defined from a funding agency to those based on local knowledge.

Format of the ANdiNA workshop

The structure of the ANdiNA workshops provides an ideal setting to address the questions and aims presented, due to its immersive and unconventional format, which foregoes traditional activities like poster sessions or speaker presentations. ANdiNA workshops are designed to combine in-depth discussions held in a venue reserved exclusively for participants and include dynamic "walkshops" in the surrounding natural environment, allowing smaller groups to interact while on the move. Since its inception, the overall aim of ANdiNA has been to foster deep debate amongst scientists by focusing on critical issues in ecology and environmental sciences, filling the gap left by traditional conferences. Workshops have taken place globally, with each session designed to explore different scientific challenges, including transdisciplinary research, species range shifts and invasive species management, for 12 years now. The workshops usually bring together 25-35 participants, blending early-career and experienced researchers from

diverse disciplines and countries, with costs kept as low as possible, especially for early career researchers (ECRs) and no financial incentives offered. By employing creative facilitation techniques, these workshops foster dynamic and inclusive environments that inspire collaboration and drive innovation. Locations are carefully selected for their inspiring settings, which foster creativity, connection with the environment and meaningful interactions amongst participants. By varying the venues, these workshops also create opportunities for people from different continents to join and contribute to the collaborative experience.

Call for participation and selection process

Approximately a year before the workshop was to take place, the organising committee opened a call for participation in the ANdiNA 2024 meeting, promoting it through social media and professional networks and committee members also invited specific individuals they believed would be a good fit for the event to apply. The selection criteria prioritised participants with diverse stakeholder engagement experience in the field of ecology, a drive for change or innovative approaches and representation across research interests, gender and geographic regions. Targeted groups included ecologists, environmental scientists, conservation biologists, social scientists, philosophers, practitioners, journalists, NGO members and policy-makers. The committee was also particularly interested in the participation of representatives from major ecological societies. Applications were split into early-career researchers (ECRs) and non-ECRs and each group was scored separately according to how relevant their participation was to the workshop, based on a 1-3 ranking. Rankings were adjusted to ensure representation of topics and interests, with top-ranked individuals accepted. The organising committee received a total of 64 applications, of which 19 were selected to participate. The number was determined, based on venue capacity and prior experience with the optimal participant count for effective engagement and interaction.

Detailed programme for the workshop and methodology

Based at the lodge La Baita, in Conguillío National Park in southern Chile, the workshop took place on 19-23 February 2024. All participants met in Temuco, a nearby city and travelled to the Park. The programme was centred on “the big question”, the structure of the workshop being prepared and facilitated by Mike Williams, principal of Michael Williams & Associates Pty Ltd, a Sydney-based natural resource management strategy and facilitation firm, with extensive experience in facilitating workshops, including all previous ANdiNA workshops, governance frameworks and co-management agreements for various Australian governments, NGOs and Aboriginal communities. The workshop followed the overall format of previous ANdiNA meetings, with morning and evening working sessions in the venue and afternoon hikes in the surrounding areas within the National Park. Late evenings included activities designed by participants to create fun spaces to socialise and network.

Figure 2. doi

Day 1 presentations, including representatives of the local Mapuche community. Photo credit: Mariana Chiuffo. This figure is licensed by its author under a Creative Commons Attribution 4.0 International (CC BY 4.0) license.

Day 1: Monday, 19 Feb 2024 (Fig. 2)

Travel and Opening Sessions

- 08:00-12:30 – Travel to La Baita

Participants departed at 8:00 am from the Best Western Ferrat Hotel in Temuco. There was a briefing, waiver forms and brief introductions. On the way to the venue participants met Mapuche elders from the local indigenous people and representatives of the community at *Truful Truful* Gorge. There, participants were briefed about the Mapuche cosmovision of nature, learned about the environmental problems in the region and their concerns about them. During the journey, participants formed pairs with their neighbours and had the task of introducing themselves and answering ice-breaking questions in order to introduce their matched pair to the rest of the group later in the day.

- 12:30-13:00 – Arrive & Setup

Participants arrived at La Baita, checked in and settled.

- 14:00-15:00 h – Lunch with Mapuche representatives
- 15:00-17:00 h – Welcome & Workshop Goals

Facilitators and the La Baita team introduced themselves and provided a safety briefing. Each participant presented their paired neighbour to the rest of the group. Mapuche community representatives stayed for the presentations. Aníbal Pauchard, a Chilean

professor at University of Concepción that has extensive experience working in the area, delivered a short presentation on Conguillio's natural history.

- 18:00-20:00 h – Workshop Aspirations

"The big question" was introduced, initial discussions focused on workshop goals and outcomes. An overview of ANdiNA workshops and goals was presented, followed by discussions on desired outputs, facilitated by Mike and the team.

- 21:00-22:00 h – Evening Social Time

Day 2: Tuesday, 20 Feb 2024

Exploring the Big Question

- 08:30-09:00 h – Rhythm & Protocols

The day began with an overview of the agenda and workshop approaches.

- 09:00-10:30 h – Session 1: The Big Question

Participants refined "the big question" and identified key sub-questions for small group sessions.

- 10:30-11:00 h – Morning Tea
- 11:00-12:30 h – Session 2: Preparing the Pitch

Sub-questions were formulated and developed for further discussion.

- 13:00-17:30 h – Walkshop 1

A light hike with landscape interpretation and informal group discussions.

- 17:30-18:00 h – Personal Time
- 18:00-20:00 h – Session 3: World Café / Cocktail Bar

Participants pitched and refined sub-questions for small group discussions.

- 20:00-21:00 h – Dinner
- 21:00-22:00 h – Quiz Night

Day 3: Wednesday, 21 Feb 2024

Deep-Dive Discussions

- 08:30-09:00 h – Reflection & Overview

Participants reviewed outcomes from the previous day.

- 09:00-10:30 h – Session 4: Small Group Discussions – Part 1

Priority sub-questions were discussed in depth.

- 10:30-11:00 h – Morning Tea
- 11:00-12:30 h – Session 5: Small Group Discussions – Part 2

Discussions continued, focusing on refining outputs.

- 13:00-17:00 h – Walkshop 2

This walk emphasised refining workshop products through informal discussions.

- 17:00-18:00h – Personal Time
- 18:00-20:00 h – Session 6: Recipes for Success

Practical discussions on transforming ideas into actionable outputs.

- 20:00-21:00 h – Dinner
- 21:00-22:00 h – Poetry Night

Day 4: Thursday, 22 Feb 2024 (Fig. 3)

Figure 3. doi

Day 4: Group photo after the walk. Photo credit: Prabhu Ramachandran. This figure is licensed by its author under a Creative Commons Attribution 4.0 International (CC BY 4.0) license.

Drafting & Action Planning

- 08:30-09:00 h – Reflection & Overview

Outcomes from Wednesday were reviewed.

- 09:00-10:30 h – Session 7: “Shut Up and Write”

Participants worked in small groups to draft outputs.

- 10:30-11:00 h – Morning Tea
- 11:00-12:30 h – Session 8: Keep Writing

Writing continued, with feedback incorporated into drafts.

13:00-17:00 h – Walkshop 3

Focused on action planning during informal discussions.

- 17:00-18:00 h – Personal Time
- 18:00-20:00 h – Session 9: Action Planning

Small groups developed next steps, including publication plans and timelines.

- 20:00-21:00 h – Dinner
- 21:00-22:00 h – Little Concert

La Baita owners and local musicians performed for the group.

Day 5: Friday, 23 Feb 2024

Wrap-up & Departure

- 08:30-09:00 h – Reflection & Overview

Participants reflected on Thursday's outcomes.

- 09:00-10:30 h – Session 10: Commitments to Future Work

Milestones and deadlines for post-workshop actions were established.

- 10:30-11:00 h – Morning Tea & Group Photo
- 11:00-12:30 h – Session 11: Closing

The workshop concluded with final reflections, evaluations and expressions of gratitude.

- 12:30-13:30 h – Lunch (packed lunch for the bus)
- 13:30-16:00 h – Return Travel to Temuco

Key outcomes and discussions

Topics discussed

While the meeting outcomes emerged organically, initial activities focused on defining and evaluating different forms of responsibility, obligation and realistic expectations. The workshop moderator also facilitated discussions about plausible mechanisms to codify and assess how scientists engage with societal issues. The World Café activity then

provided participants with a platform to pitch their ideas to the group. Proposed topics were displayed on a wall and each "pitcher" delivered a brief presentation outlining their topic. Participants then engaged in discussions and voted on the proposals they found most compelling. Based on this feedback, the topics were either selected for further development or set aside for later consideration in subsequent sessions (Fig. 4).

Figure 4. doi

Group discussions during the workshop. Photo credit: Mariana Chiuffo. This figure is licensed by its author under a Creative Commons Attribution 4.0 International (CC BY 4.0) license.

Amongst the topics proposed, but not further developed, yet still hinting at promising directions for future exploration, were:

Care-giver workshops in academia: Participants highlighted the pressing need for workshops tailored to accommodate and support caregivers, particularly those responsible for small children. These workshops would be organised addressing the unique challenges caregivers face in balancing the demands of academic careers with their caregiving responsibilities. Key themes of discussion included the importance of creating an inclusive environment where caregivers can share experiences and solutions, as well as providing practical tools and strategies to navigate their dual roles effectively. Participants envisioned a "perfect workshop" that would not only offer logistical support, such as child-friendly facilities and flexible scheduling, but also include mentorship opportunities, mental health resources and guidance on navigating academic policies.

A Large Hadron Collider for ecology: The idea was to discuss why and what would it take for Ecology to have a Project that would attract that level of funding and global attention typically reserved for monumental physics projects like the Large Hadron Collider. The group noted, however, that, while such a unified, large-scale project may not yet exist in Ecology, significant budgets have been allocated to biodiversity and climate change research initiatives, reflecting a growing recognition of their global importance.

Deconstructing Ecologists: There was interest in critically examining the identities, roles and biases of ecologists, questioning how these influence research, practice and the communication of ecological knowledge. Additionally, the need to decenter EESs in the study of eco-sociological systems, to instead centre local communities needs or even the ecosystems.

Final themes chosen for further development

Defining professional responsibilities for EESs in the global crises

Participants discussed how ecologists and environmental scientists (EESs) play important and diverse roles, including their work as researchers, practitioners, educators, policy advisors and decision-makers, science communicators and advocates or activists (Arnillas et al. 2024; Fig. 5). Yet, their collective impact is often diluted due to fragmented efforts and a lack of clear professional guidance. While some EES societies have committed to sustainability, they often fail to provide actionable frameworks to align individual and collective actions (Ortiz et al. 2024). To address this gap, discussions led to the *Conguillío Statement* (Arnillas et al. 2024), which proposes a shared framework of values and responsibilities centred on the collective goal of "taking care of Nature". The statement emphasises care as a dynamic process tailored to the complexities of ecosystems and social-ecological systems (Tronto 2015) and considering that Nature includes people and encompasses all ecosystems, regardless of the degree of impact that people have on them. This framework provides a shared foundation for EES societies to develop guidelines that harmonise members' actions across various roles, fostering greater societal impact. The statement is intended to work as a draft for the societies to reflect on shared values and responsibilities. By finding common ground on these values and responsibilities, these societies can empower their members to align efforts towards a sustainable future.

The *Conguillío Statement*, so far available in three languages, has already sparked global conversations amongst EES societies, including the Argentinian Ecological Society, which has officially adopted it. This dialogue is exemplified by an editorial published in the Argentinian Ecological Society monthly bulletin (https://www.asaeargentina.com.ar/docs/amen/diciembre-2024.pdf), along with a response to one of the points raised by the Statement (Newman 2025). A manuscript under review calling academic and professional societies grouping EESs to foster this conversation has also emerged from this work, inviting and including their members and universities. The time for "business as usual" has passed—EESs must unite and translate this vision into transformative practices that support both nature and humanity.

Two-eyed seeing social-ecological change in the landscapes of South-Central Chile: perspectives from a Mapuche healer and ecological researchers

Conversations with Mapuche representatives highlighted the critical role scientists play in amplifying the voices and struggles of those living in the lands where EESs research takes place. The Mapuche people, whose history is marked by land disputes and

ongoing conflicts with the Chilean State, face threats that endanger their profound connection to the land. Land-use changes, industrial forestry and hydroelectric projects disrupt hydrological cycles, sacred sites and access to medicinal plants, undermining their cultural and spiritual heritage (e.g. Carruthers and Rodriguez (2009)). These exchanges emphasised the need for scientists to shift the focus of research towards uplifting Indigenous Peoples and Local Communities, centring their experiences and fostering collaboration to amplify their causes effectively. Hence, the central theme emerging from this working group was the importance of crafting a paper that not only highlights the environmental challenges faced by the community, but places their voices at the forefront. The goal is to document these issues from their perspective, emphasising their experiences, cultural knowledge and the impacts of these challenges on their way of life. By centring their narratives, the paper aims to bridge the gap between scientific research and the realities of Indigenous Peoples and Local Communities, fostering a more inclusive and impactful approach to addressing ecological and social challenges.

Figure 5. doi

Discussions about the different roles that EESs may play. Photo credit: Florencia Yannelli. This figure is licensed by its author under a Creative Commons Attribution 4.0 International (CC BY 4.0) license.

Increasing conservation impact in a time of global crisis

This initiative addresses a pressing question for those working in the field of ecology: How can we amplify our impact in reversing the biodiversity and climate crises? Aimed primarily at early-career researchers and practitioners or those new to this mindset, it explores how to shift from traditional approaches towards more solution-orientated, transformative action. Motivated by a shared frustration that current efforts often fall short of creating meaningful change, this work critically examines how we allocate time and energy across research, advocacy and policy work. By reflecting on whether we are

asking the right questions and taking the most effective actions, it highlights opportunities to re-prioritise strategies for greater conservation impact. Written for an academic audience, this paper seeks to inspire researchers and practitioners to break through barriers, re-imagine their roles and become more effective agents of change in addressing the intertwined crises of biodiversity loss and climate change.

Dialogues in Mapuche Landscapes

The participant Ken Ehrlich photographed everyone who was part of the workshop in dialogue with another participant in and around Conguillio National Park. The conference highlighted the importance of discourse between disciplines and the public and the images are intended to give a visual form to these kinds of conversations. The photographs are paired with a large drawing. The images both document the fleeting forms of communication that took place during the conference and point to the need to re-imagine both science and art as discourses that must take up the challenges presented by the climate crisis (Fig. 6).

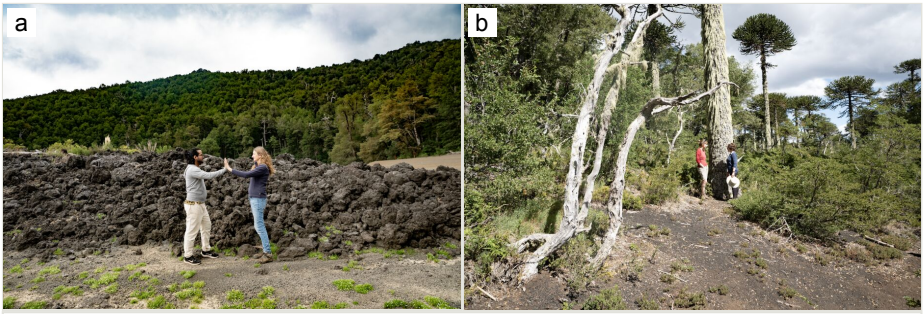

Figure 6.

Through a series of portraits taken in and around Conguillío National Park, Ken Ehrlich captured workshop participants engaged in dialogue, reflecting the conference's emphasis on interdisciplinary exchange. Photo credit: Ken Ehrlich. This figure created by two photos, is each licensed by its author under a Creative Commons Attribution 4.0 International (CC BY 4.0) license.

a: Bruno Soares and Hazel Norman; doi
b: Lesley Hughes and Kristiina Visakorpi. doi

Towards a value-based education for EESs

Discussions underscored the critical need to realign the training of EESs towards a value-based education that integrates ethical commitments, societal roles and diverse epistemologies alongside technical skills. Participants emphasised that effective ecological practice requires understanding why we pursue this field, our responsibilities towards society and how to foster meaningful collaborations with various societal actors. We proposed the development of a programme that incorporates courses on ethics, societal engagement, leadership and policy-making, paired with experiential learning opportunities through internships with decision-makers and local stakeholders. The central theme emerging from this working group was the importance of equipping

ecologists with the skills and frameworks to address socio-ecological challenges collaboratively and holistically.

University for the future

The mission of most universities is the production of knowledge for the improvement of society and the education of the next generation of academics to continue on this mission. Nevertheless, academia that is built on elitist, colonial and patriarchal legacies and operates as part of the neoliberal market system, is unlikely to succeed in this mission. For example, the race for greater productivity discourages open and interdisciplinary discussions on new ideas (Kozlov 2023) and when they do take place, patriarchal, classist and colonial structures exclude many people and points of view from these discussions. Elitism of academia has contributed to widespread scepticism, distrust of academics or the full reliance on social media and national politics (Scheufele and Krause 2019), feeding misinformation and resulting in dismissal of scientific advice. For these reasons, academia built on these exclusionary and harmful principles is likely to fail to provide solutions to the societal and environmental crisis we are facing. There is, therefore, a need to re-imagine an academia that leaves these harmful legacies behind. This “anti-university” is not-for-profit, is in service and part of society and built around values of intellectual humility, genuine collaboration and sustainability. Imagining an alternative to the status quo can serve as a first step in realising that alternative. The purpose here is to create a vision of how an anti-university would function and how aspects of it could be introduced to contemporary academic structures and practices.

Conclusions

The meeting fostered dynamic discussions and collaborative brainstorming to address what the group felt were the pressing challenges facing EESs in a time of global crises. Key themes emerged, including the need to define professional responsibilities, amplify Indigenous and local voices and re-imagine education and academic structures to align with ethical values and societal needs. Many of these key themes have evolved into calls for action or scientific manuscripts. The *Conguillío Statement* was proposed as a framework to unify EESs around shared values and responsibilities, emphasising the importance of care and collective action in addressing socio-ecological challenges. Other initiatives focused on integrating Indigenous knowledge, prioritising conservation impact through actionable research and fostering transformative practices to bridge the gap between science and society. Discussions highlighted the importance of shifting research priorities towards actionable solutions, advocating for evidence-based policies and embracing collaboration with marginalised communities (Fig. 7).

Figure 7. doi

Word cloud illustrating key feedback from participants at the 2024 ANdiNA workshop, highlighting the diverse perspectives of participants and topics addressed. Larger words represent the ones most frequently found in the written feedback. Colours have no meaning.

Acknowledgements

This report describes the motivation and the outcome of discussions initiated at the five-day ANdiNA VI workshop at La Baita, Parque Nacional Conguillío, Chile in February 2024. We acknowledge the warm welcome that we received from local Mapuche elders, the indigenous peoples of the territory on which we met. The workshop was partly funded by the University of California, Riverside, USA and facilitated pro bono by Michael Williams. Funding from the University of Toronto helped support travel of ECRs. Additional funding sources include the Kone Foundation (grant number 202203652) for AA, CONICET (PIBAA 2022–2023) for MCC, the Wissenschaftliche Gesellschaft in Freiburg im Breisgau for FS, and the Alexander von Humboldt Stiftung through the Feodor Lynen Fellowship for FAY.

Conflicts of interest

The authors have declared that no competing interests exist.

References

- Arnillas CA, Stotz G, Chinga Chamorro JB, Collinge S, Chiuffo M, Kariuki R, Norman H, Ortiz AM, Regan H, Visakorpi K, Devarajan K, Klein A, Schnabel F, Arponen A, Cadotte M, Cousens R, Ehrlich K, grell-brisk m, Hughes L, Kharouba H, Martin T, Morelli T, Rumpff L, Soares B, Prado-Valladares AC, Williams M, Winter M, Yannelli FA, Beyene M, Fernando Y, Hart T, Santaoja M, Santos Domínguez N (2024) The Conguillío Statement on the values and responsibilities of ecologists. EcoEvoRxiv https://doi.org/10.32942/x2b90t
- Bird S (2014) Socially Responsible Science Is More than “Good Science”. Journal of Microbiology & Biology Education 15 (2): 169-172. https://doi.org/10.1128/jmbe.v15i2.870
- Carruthers D, Rodriguez P (2009) Mapuche Protest, Environmental Conflict and Social Movement Linkage in Chile. Third World Quarterly 30 (4): 743-760. https://doi.org/10.1080/01436590902867193
- Foundation NS (2023) NSF Public Access Plan 2.0. National Science Foundation. URL: https://nsf-gov-resources.nsf.gov/pubs/2023/nsf23104/nsf23104.pdf
- Fraser B (2017) Argentine scientist indicted over design of glacier inventory. Science https://doi.org/10.1126/science.aar6762
- Ibarra JT, Petitpas R, Barreau A, Caviedes J, Cortés J, Orrego G, Salazar G, Altamirano T (2022) Becoming tree, becoming memory: Social-ecological fabrics in Pewen (Araucaria araucana) landscapes of the southern Andes. The Cultural Value of Trees15-31. https://doi.org/10.4324/9780429320897-3
- IPBES (2019) Global assessment report on biodiversity and ecosystem services of the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services (Version 1). Zenodo https://doi.org/10.5281/zenodo.6417333
- Kozlov M (2023) ‘Disruptive’ science has declined — and no one knows why. Nature 613 (7943): 225-225. https://doi.org/10.1038/d41586-022-04577-5
- Newman J (2025) No, ecosystems do not have intrinsic value! A response to the Conguillío Statement. EcoEvoRxiv https://doi.org/10.32942/x2zp7v
- Ortiz AM, Kariuki R, Santos Domínguez N, Arnillas CA, Regan H (2024) A review of professional ecological societies’ values, missions, and ethics. EcoEvoRxiv https://doi.org/10.32942/x2v90g
- Parsa-Parsi RW (2017) The Revised Declaration of Geneva. JAMA 318 (20). https://doi.org/10.1001/jama.2017.16230
- Scheufele D, Krause N (2019) Science audiences, misinformation, and fake news. Proceedings of the National Academy of Sciences 116 (16): 7662-7669. https://doi.org/10.1073/pnas.1805871115
- Suber P (2006) Open access in the USA. Open Access149-160. https://doi.org/10.1016/b978-1-84334-203-8.50015-7
- Tollefson J, Mega ER (2017) Geoscientist faces criminal charges over glacier survey. Nature 552 (14): 159-160. https://doi.org/10.1038/d41586-017-08236-y
- Tronto J (2015) Democratic caring and global care responsibilities. Ethics of Care21-30. https://doi.org/10.56687/9781447316527-004