REQUEST FOR PROPOSALS

Surface Albedo Modification (SAM) Landscape Assessment and Opportunity Scoping

Ocean Visions is seeking proposals from organizations or individuals to provide a rapid assessment of the Surface Albedo Modification landscape that characterizes known and emerging approaches, key actors, relevant technologies, and potential mechanisms for advancing SAM R&D. The assessment is intended to inform future Ocean Visions R&D activities.

About Ocean Visions

Ocean Visions is a nonprofit conservation organization pursuing bold solutions to counter and reverse climate impacts on ocean health. Working with a global network of partners, we explore, evaluate, and advance innovations to address climate-driven harm to the ocean. We work on system-level challenges where solutions are least developed, most complex, or politically difficult—but potentially transformative. Our work is grounded in robust science, and we continually seek to improve our understanding of the complexity of the challenges to the ocean posed by climate change.

Ocean Visions works on an interdependent four-part strategy to directly address the causes and impacts of climate disruption, from an ocean lens:
REDUCE: Identify and advance high-leverage ocean-based opportunities for a just transition to a low carbon economy
REMOVE: Identify and advance ocean-based pathways for cleaning up legacy carbon pollution from the air and ocean
REPAIR: Identify and advance interventions to avoid catastrophic loss of critical marine ecosystems and passing of dangerous tipping points
REACH: Support the growth of a global community to develop and advance innovative ocean-climate solutions

Ocean Visions does not advocate for the deployment of climate intervention approaches but supports research and dialogue to improve understanding of viability and efficacy, potential risks, benefits, limitations, and governance considerations. Find out more about Ocean Visions' Repair Program - https://oceanvisions.org/our-strategy/repair/.

Why Surface Albedo Modification

Climate change is driving rapid and dramatic changes in the ocean and cryosphere, increasing the risk of ecosystem loss, climate feedbacks, and dangerous climate tipping points. Through our Repair program, Ocean Visions explores pathways that could help avoid catastrophic loss of critical marine ecosystems and passing of dangerous climate tipping points while society continues work to reduce emissions and remove legacy carbon pollution as the durable solution to climate change.

The Repair program currently focuses on Arctic sea ice, a system critical to global ocean and climate stability whose continued decline poses risks to Arctic ecosystems, regional climate stability, and the broader climate system.

To assess proposed approaches for slowing the loss of Arctic sea ice and to identify key knowledge gaps and research priorities, Ocean Visions, in collaboration with a team of international partners, developed the Arctic Sea Ice Road Maps in 2024. The Road Maps identified what is known and unknown about regional and global climate intervention approaches and their relevance to preserving a frozen Arctic across five categories of approaches: Surface Albedo Modification, Solar Radiation Modification, Ice Management, Pollution Management and Ecosystem Protection. Key remaining knowledge gaps and first-order priorities needed to advance understanding across feasibility, impacts, engagement, and governance for each approach are highlighted in the Road Maps.

To close these knowledge gaps, Ocean Visions created the Arctic Sea Ice Restoration Research Fund. The Fund directs resources to first-order priorities identified in the Road Maps, enabling responsible progress where little activity currently exists. The Fund is currently supporting research on three approaches and will support other high-priority research in future funding rounds. The Road Maps assess both regional and global approaches relevant to the Arctic, and some of the approaches, including Surface Albedo Modification, may be relevant across a range of scales and geographies.

Surface Albedo Modification (SAM) encompasses a broad range of potential approaches intended to increase the reflection of incoming sunlight from surfaces such as snow, ice, land, water, infrastructure, or other materials (e.g. geotextiles on glaciers, films or microbubbles on the ocean surface, painting roofs white). Regional and global SAM remains at an early stage of evaluation. Some approaches that have been proposed in this category are ongoing (e.g. micro or nano bubbles are in conceptual or lab stages), whereas some have halted (e.g. research into hollow glass microspheres regionally applied to Arctic sea ice has stopped due to early research findings on social and environmental impacts).

Ocean Visions seeks to deepen understanding of the current and potential approaches to advance SAM and their relevance across a range of geographies and scales. This includes the people, technologies, ideas, and questions that could help clarify which approaches warrant additional investigation, if any.

SAM Background

As global warming has accelerated (Foster and Rahmstorf 2026), and significant increases in Earth's Energy Imbalance have been observed (Mauritsen et al. 2025), research has begun to focus on better understanding this acceleration, including a wider examination of all the factors that influence how much incoming solar energy is reflected back to space (Stevens et al. 2026). Some have suggested that as reflectivity from clouds and emitted aerosols decreases, the role of surface albedo in regulating surface temperatures could increase in significance (Bellocchi et al 2026).

Accordingly, different SAM approaches have begun to be explored in limited modeling studies, with major gaps remaining in understanding whether or not any of these approaches are technically achievable and what their socio-ecological impacts may be (reviewed in Haywood et al. 2025). While some SAM approaches have received limited research attention, the broader landscape remains fragmented, with relatively little coordination across disciplines, sectors, and geographic regions.

Research, innovation, and operational expertise that could inform potential approaches to SAM may exist across a range of fields, but these communities are often disconnected and underutilized. As a result, it remains unclear if there are promising SAM approaches, if and which knowledge or technology gaps are most constraining progress, and whether any approaches show the potential to contribute meaningfully to climate-relevant outcomes at regional or global scales.

Ocean Visions seeks proposals for an assessment that will help us better understand three related aspects of the SAM landscape:

1. All known and potential SAM approaches and their current state of development;
2. The current state of enabling technologies, expertise, and capabilities that could support their development and evaluation; and

3. Potential pathways for supporting and accelerating research, development, coordination, and learning within the field.

Many SAM approaches rely on underlying technologies, capabilities, and expertise that originate in other fields, such as materials science. Understanding those enabling elements is an important part of assessing the feasibility and development potential of different approaches.

Ocean Visions is seeking proposals from organizations or individuals to provide a rapid assessment of the SAM landscape that characterizes emerging approaches, key actors, relevant technologies, and potential mechanisms for advancing SAM R&D. The assessment is intended to inform future Ocean Visions R&D activities, which may take a number of different forms.

The objective of this work is not to advance a specific SAM approach. Instead, Ocean Visions seeks to better understand the landscape of approaches, technologies, actors, and opportunities and barriers that could shape future R&D in this area.

Scope of Work

The selected respondent will conduct an assessment of the SAM landscape. The assessment should generate evidence and analysis that enables Ocean Visions to evaluate its potential future role in advancing responsible SAM research and innovation. Particular emphasis should be placed on identifying promising SAM approaches, enabling technologies, relevant scientific and technical expertise, and potential mechanisms for advancing research and development in the field.

The focus of this assessment is on scientific, technical, and innovation-related aspects of SAM. Governance considerations may be identified where relevant but are not the focus of the assessment.

Ocean Visions has already completed a technical assessment of several SAM approaches in our Arctic Sea Ice Road Maps. That work should be used as baseline information rather than duplicated.

Phase 1: Landscape and Ecosystem Mapping and Opportunity Discovery

Conduct a landscape assessment of SAM approaches, technologies, and relevant adjacent fields. The landscape assessment should incorporate ocean, land, ice, and built environment albedo modification, and identify other adjacent fields, such as materials and engineering sciences or others, that are relevant to advance SAM.

Areas of investigation may include:

- Technologies and adjacent innovation areas, such as development of new materials, inclusive of those that may be applicable to SAM but are not currently well connected to the field
- Novel approaches, technologies, or ideas from academia, industry, startups, patents, and grey literature
- Priority research needs where significant knowledge or technological gaps remain
- Organizations, researchers, companies, industry actors, and networks active in or adjacent to SAM fields that could be relevant to SAM
- Relevant funding and investment activity, including any major funders, recipients, funding patterns, and areas that appear underexplored or under-resourced relative to their potential importance

Deliverables

A report including the following:

- Inventory of all known and proposed SAM approaches, including intended mechanism, state of development, evidence base, key uncertainties, and, where possible, technology readiness or maturity
- Assessment of the technologies, expertise, capabilities, and adjacent fields most relevant to advancing the development of SAM approaches
- Ecosystem map of relevant organizations and actors, including those from adjacent fields that if connected could potentially accelerate SAM R&D

Deliverables should consider the following, where relevant in preparation for future interviews and the Final Synthesis Report:

- Known and emerging approaches, priority research directions, and underexplored research areas
- Enabling technologies and relevant expertise
- Major knowledge and technology gaps
- Potential mechanisms for advancing research and development

Phase 2: Actor Engagement and Opportunity Assessment

Validate, refine, and contextualize findings from Phase 1 by conducting structured interviews or an equivalent engagement process across relevant communities in academia, industry, or government. Examples of relevant community members include researchers, engineers, innovators, entrepreneurs, companies, investors, and other stakeholders, including Indigenous Peoples and community leaders that may be specific to any regional focus areas, relevant to the development and evaluation of SAM approaches based on the findings of Phase 1. The interview list will be developed in consultation with Ocean Visions after review of the Phase 1 findings.

The purpose of these conversations is to:

- Assess perceptions regarding the significance, feasibility, scalability, and major uncertainties associated with approaches identified during Phase 1.
- Evaluate which scientific, technical, engineering, or operational barriers are viewed as most important to advancing research and development.
- Identify additional approaches, technologies, expertise, organizations, or activities that may not have been captured through Phase 1.
- Identify potential collaborations, partnerships, and coordination needs that could help address key knowledge gaps or accelerate research and development.

Ocean Visions anticipates that stakeholder engagement will include interviews or an equivalent engagement process to capture a representative sampling of the field. Respondents may propose alternative approaches if they believe they can effectively meet project objectives.

Following interviews, the respondent will incorporate learnings from the interviews and update their analysis conducted in Phase 1 in a final report. The respondent will prepare a Final Synthesis Report that presents findings in a format designed to support Ocean Visions' assessment of current and future opportunities for contribution to responsible SAM research and field development. The Final Synthesis Report should integrate and synthesize findings from Phases 1 and 2, highlighting areas of agreement, uncertainty, and priority questions that emerged through the assessment. The respondent should clearly distinguish between conclusions supported by substantial evidence and those based on emerging or highly uncertain information.

Deliverables

- Interview (or other proposed approach) synthesis report that includes assessment of key opportunities, barriers, and unmet needs for advancement of R&D
- Final Synthesis Report that:
    - Characterizes the current SAM landscape and key priorities and leverage points for R&D advancement, including the current evidence base, enabling technologies, key uncertainties, and critical knowledge, technical, or coordination gaps.
    - Refines the ecosystem map (begun in Phase 1) that describes relevant organizations, expertise, and ongoing activities. This includes current funding and investment activity, including major funders, recipients, and areas that appear underexplored or resourced.
    - Identifies potential areas (e.g. emerging approaches, underexplored research directions, technologies) where future investment, coordination, or field-building activities might accelerate learning or innovation.

Desired Qualifications

Ocean Visions welcomes proposals from individuals or organizations with expertise in one or more of the following areas:

- Environmental, physical, or chemical sciences or engineering
- Research and technological development
- Technology scouting and landscape assessment
- Research program development
- Stakeholder engagement and facilitation

Experience working across disciplines and identifying opportunities in emerging fields is particularly valuable.

Budget

The total budget available for this project is $60-80K.

Timeline

The anticipated duration of the project is approximately **3-4, not to exceed 5, months.**

Respondents are encouraged to propose an approach, timeline, and level of effort that they believe will most effectively achieve the objectives of this assessment within budget limits. Ocean Visions recognizes that tradeoffs may exist between breadth, depth, and available resources and welcomes thoughtful justification for the proposed scope of work.

Proposal Requirements

1. Narrative describing qualifications and experience relevant to the deliverables. Respondents should explain their qualifications and capacity to complete this scope of work.
2. Proposed approach and methodology
3. Proposed team, including key personnel and roles, with resumes/CVs
4. Proposed workplan and timeline for each phase, including communication plan with Ocean Visions
5. Proposed budget for each phase

Proposal length should not exceed 5 pages, excluding resumes/CV's and budget. The proposal should consider the workplan in two phases of work with a specific timeline and budget assigned to each phase. Ocean Visions will review Phase 1 deliverables with respondent and determine whether to advance Phase 2.

Submission and Selection Timeline Information

Interested respondents should submit a proposal that describes their proposed approach to completing the scope of work outlined above to **Submittable** by October 5th, 2026. The submission step includes logging into Submittable via an existing email account, or creating a new account, and uploading a PDF of the proposal. Review of applications will begin immediately with the contractor expected to start in early November 2026.