2021 2030 United Nations Decade of Ocean Science for Sustainable Development

REQUEST FOR ENDORSEMENT OF DECADE ACTION:

DECADE PROGRAMME Proposal

GEOS

A Global Ecosystem for Ocean Solutions

"Establish a vibrant, global ocean solutions community of researchers, innovators, investors, decision-makers, and other stakeholders to co-design and co-deploy equitable, durable, and scalable ocean-based solutions for climate change and other ocean grand challenges"

www.oceansolutions.org

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GEOS Lead Partners

USA

OCEAN VISIONS

Georgia Institute of Technology
Stanford University
Massachusetts Institute of Technology
The Smithsonian Institution
Scripps Institution of Oceanography
Woods Hole Oceanographic Institution
Skidaway Institution of Oceanography and University of Georgia
University of California Santa Barbara
Ocean Conservancy
Georgia Aquarium
Monterey Bay Aquarium
Birch Aquarium at Scripps

AGU ADVANCING EARTH AND SPACE SCIENCE

American Geophysical Union

Australia

FUTURE SEAS

University of Tasmania
CSIRO
Currently working with Indigenous Groups South Pacific, SnowChange Coop., ICCA Consortium, Haida Nation, Nordic Council Nation & others

France

OCEAN & CLIMATE PLATFORM

> 70 international organizations, NGOs, academic, private and public

India

ESSO

Indian National Centre for Ocean Information Services

Canada

OCEAN NETWORKS CANADA

University of Victoria
Memorial University
Dalhousie University
University of British Columbia
University of Calgary

International

Early Career Ocean Professionals (ECOP) network

IGO

PICES

Canada
Russia
South Korea
Japan
China
USA

IGO

United Nations Educational, Scientific and Cultural Organization

Intergovernmental Oceanographic Commission

International

1000 OCEAN STARTUPS
A coalition to accelerate Ocean Impact Innovation

OceanHub Africa
Blue Ocean Partners Katapult Ocean
Uplink - World Economic Forum
Investable Ocean
Ocean Exchange
Aiim Partners
Ocean Futures Innovation Hub
Others

International

BlueTech Cluster Alliance

Blue Growth (UK)
Forum Oceano (Portugal)
Marine Institute (Ireland)
Ocean Advance (Canada)
PLOCEAN (Spain)
Pole Mer Mediterranee (France)
TMA BlueTech (USA)
GCE Ocean Technology (Norway)
Pole Mer Bretagne Atlantique (France)

SECTION 1. OVERVIEW OF PROPONENT AND PROPOSED DECADE PROGRAMME

* 1. Lead Institution

The GEOS Programme is led by an international coalition of universities, programs and organizations.

**Represented in GEOS Steering Committee*

- *Ocean Visions (USA) - www.oceanvisions.org (serves as point of contact and lead)
- *Future Seas (Australia) - futureseas2030.org (serves as point of contact and lead)
- *North Pacific Marine Science Organization (PICES)(Canada, Russia, China, South Korea, Japan, USA) - www.pices.int
- *IOC-UNESCO (International) - ioc-unesco.org
- *Ocean Knowledge-Action Network (International)- Link
- *Early Career Ocean Professionals (ECOP) Programme (International)- ecopdecade.org
- *Indian National Centre for Ocean Information Services (India) - incois.gov.in
- National Center for Polar Ocean Research (India) - http://www.ncaor.gov.in/
- Center for Euro-Mediterranean Climate Change (Italy) - www.cmcc.it
- *Ocean Conservancy (NGO) - www.oceanconservancy.org
- *Geophysical American Union (USA) - www.agu.org
- *Ocean and Climate Platform (France) - www.ocean-climate.org
- *Ocean Networks Canada (Canada) - www.oceannetworks.ca
- *CoastPredict - www.coastpredict.org
- *1000 Ocean Startup Coalition under the High-Level Panel for a Sustainable Ocean Economy including:
    - *OceanHub Africa - www.oceanhub.africa
    - Blue Oceans Partners - www.blueoceanspartners.com
    - Katapult Ocean - www.katapultocean.com/
    - *Investable Ocean - www.investableoceans.com
    - Conservation International Ventures - www.conservation.org
    - *Uplink - World Economic Forum - www.weforum.org/uplink
    - *Ocean Exchange - www.oceanexchange.org
    - *AiiM Partners - www.aiimpartners.com/
    - Schmidt Marine Technology Partners - www.schmidtmarine.org/
    - S2G Oceans
    - TOOL
    - SeaAhead
    - Ocean Impact Organisation
    - Hatch
    - Walton Personal Philanthropy Group

- *BlueTech Cluster Alliance - www.bluetechclusters.org
    - Cornwall Marine (UK) - http://www.cornwallmarine.net
    - Forum Oceano (Portugal) - http://www.forumoceano.pt
    - GCE Ocean Technology (Norway) - https://www.gceocean.no
    - Irish Maritime Development Office (IMDO) (Ireland) - www.imdo.ie
    - Oceans Advance (Canada) - http://www.oceansadvance.net
    - PLOCAN (Spain) - http://www.plocan.eu
    - Pole Mer Bretagne Atlantique (France) - pole-mer-bretagne-atlantique.com
    - Pole Mer Mediterranee (France) - www.polemermediterranee.com
    - *TMA BlueTech™ (US) - www.tmabluetech.org
    - Marine South East (UK) - http://www.marinesoutheast.co.uk

* 2. Lead Institution Type

Ocean Visions (www.oceanvisions.org) and **Future Seas** (futureseas2030.org) will serve as points of contact and leads for GEOS.

Ocean Visions is a United States non-profit that aims at transforming science and engineering into ocean solutions. It was established by the following academic and non-academic institutions: Georgia Institute of Technology, Stanford University, Massachusetts Institute of Technology, The Smithsonian Institution, Scripps Institution of Oceanography, Woods Hole Oceanographic Institution, Skidaway Institution of Oceanography and University of Georgia, University of California Santa Barbara, Ocean Conservancy, Georgia Aquarium, Monterey Bay Aquarium and Monterey Bay Aquarium Research Institute, Birch Aquarium at Scripps

Future Seas is an effort spearheaded by the Centre for Marine Socioecology. It counts over 130 multi-disciplinary researchers from the University of Tasmania (UTAS), the Commonwealth Scientific and Industrial Research Organization (CSIRO) and other institutions. In addition to the Australian-based researchers, Future Seas involves Indigenous representatives from around the world to define and lead Indigenous-led contributions within the initiative.

* 3. 4. 5. Lead institution physical address, Contact Person and Details

Emanuele Di Lorenzo

Ocean Visions
Program in Ocean Science & Engineering
Georgia Institute of Technology
311 Ferst Drive, Atlanta, Georgia 30332
United States of America
edl@oceanvisions.org
+1 404-788-8035

6. Partner details if relevant

Letters of commitment that describe each partner's detail are included in the Appendix A.

GEOS Steering Committee and Point of Contact

Emanuele Di Lorenzo (**USA**)
Professor & Director
Ocean Science & Engineering, Georgia Tech
Representing Ocean Visions
edl@gatech.edu, +1 (404) 788-8035

Fiorenza Micheli (**USA**)
David and Lucile Packard Professor
Co-Director, Center for Ocean Solutions
Co-Director, Hopkins Marine Station
Stanford University
Representing Ocean Visions
micheli@stanford.edu

Gretta Pecl (**Australia**)
Director, Centre for Marine Socioecology, I
University of Tasmania
Representing Future Seas
gretta.pecl@utas.edu.au

Karen Evans (**Australia**)
Team Leader, CSIRO
Representing Future Seas and EPG UN Ocean Decade
Karen.Evans@csiro.au

Guddu Murtugudde (**India**)
Representing India's National Ocean Research Institutions
raghu_murtugde@iitbombay.org

Srinivas Kumar **(India)**
Director
ESSO - Indian National Centre for Ocean Information Services
(An Autonomous Body under the Ministry of Earth Sciences, Govt. of India)
srinivas@incois.gov.in

Makino Mitsutaku (**Japan, IGO**)
Professor, The University of Tokyo
Representing PICES
mmakino@aori.u-tokyo.ac.jp

Erin V. Satterthwaite (**USA/International**)
Early Career Ocean Professionals
satterthwaite@nceas.ucsb.edu

Alexis Grosskopf (**South Africa**)
Co-Founder, OceanHub Afirca
Representing 1000 Ocean Startups coalition
alexis@oceanhub.africa

Nadia Pinardi (**Italy**)
Professor, University of Bologna
Representing CoastPredict Programme
nadia.pinardi@unibo.it

Giovanni Coppini
Director of Ocean Predictions and Applications
Representing Center for Euro-Mediterranean Climate Change
giovanni.coppini@cmcc.it

Martin Visbeck **(Germany)**
Head of the Research Unit 'Physical Oceanography' at GEOMAR Helmholtz Centre for Ocean Research Kiel, Germany
Representing GEOMAR
mvisbeck@geomar.de

Anna Zivian (**NGO-USA/International**)
Senior Research Fellow
Ocean Conservancy
Representing Ocean Knowledge-Action Network
azivian@oceanconservancy.org

Salvatore Aricò (**IGO, International**)
Head, Ocean Science Section
Intergovernmental Oceanographic Commission of UNESCO
s.arico@unesco.org

Janice Lachance (**USA/International**)
Executive Vice President, Strategic Leaders & Global Outreach
American Geophysical Union
jlachance@agu.org

Millicent Pitts (**USA**)
Chief Executive Officer/Executive Director
The Ocean Exchange (tm)
millicent.pitts@oceanexchange.org

Nathalie Chalmers (**International**)
Head of Topic Curation, Uplink
World Economic Forum
nathalie.chalmers@weforum.org

Shally Shanker (**International**)
Founder & Managing Partner
AiiM Partners
shally@aiimpartners.com

Ted Janulis
CEO
Investible Oceans
ted@investableoceans.com

Théophile Bongarts
Project Leader
Representing the Ocean & Climate Platform
tbongarts@ocean-climate.org

Kate Moran (**Canada**)
President and CEO
Ocean Network Canada
kmoran@oceannetworks.ca

Daniel Kleinman
Founder & CEO
Seaworthy Collective
Daniel@SeaworthyCollective.com

Michael Jones **(USA Cluster)**
President
TMA BlueTech
Representing TMA BlueTech (U.S.) and the BlueTech Cluster Alliance (international)
MBJones@tmabluetech.org

Carlos Barrera **(Spanish Cluster)**
Head - Ocean Vehicles Unit at Oceanic Platform of the Canary Islands
PLOCAN
Representing PLOCAN (SP) and the BlueTech Cluster Alliance (international)
Carlos.Barrera@plocan.eu

* 7. Name of proposed Decade Programme

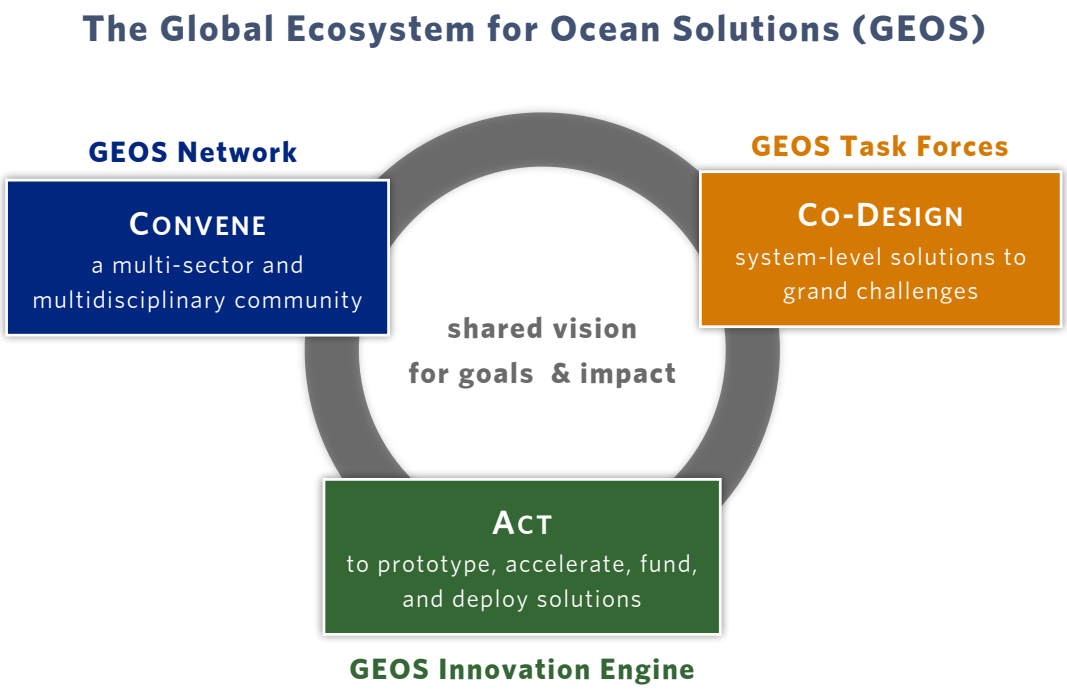
The Global Ecosystem for Ocean Solutions (GEOS)

8. Short title / acronym of proposed Decade Programme for communications purposes

GEOS

* 9. Summary description of proposed Decade Programme

GEOS will develop and deploy a series of equitable, durable, and scalable ocean-based solutions for addressing climate change and Ocean Decade's challenges. It will achieve this through three synergistic mechanisms: the **GEOS Network** made up of researchers, engineers, innovators, investors, decision-makers, and others, which will co-design the **GEOS Task Forces** for the co-creation of solution-delivering projects, and the **GEOS Innovation Engine** that will prototype and deploy those solutions. GEOS initial projects focus on ocean-based carbon dioxide removal, providing adaptation tools to coastal communities, and improving ocean-based human health, with further projects to be developed throughout the Ocean Decade.



An ecosystem that enables synergistic alignment of **researchers**, **innovators**, **investors**, **decision-makers**, and other **stakeholders** towards transforming knowledge into equitable, durable, and scalable solutions

* 10. Start & end date of proposed Decade Programme

Launch on May 20, 2021 – September 30, 2030

* 11. Estimated total budget of proposed Decade Programme

The majority of GEOS activities are the result of coordination of existing efforts by the initial partnering groups and organizations, which have ongoing funding but seek better integration in their ocean solutions initiatives. Most of the governing bodies of GEOS (discussed in section 24) rely on in-kind contributions by the partners. However, we anticipate some new expenses that arise from establishing an international project office and the development of products and activities as listed below:

Activities Expenses (1,000,000 USD)
(This is bulk cost estimate for year 1-5, see details on activities are in section 20)
Task Forces 1 on ocean CDR, 150,000 USD (in-kind contribution, OV, ONC, PICES)
Task Forces 2 on coastal solutions, 350,000 USD (in-kind contribution, OCP, OV, INCOIS, PICES, ONC, FS)
Ocean Activation Labs & Startup Competitions 100,000 USD (in-kind contributions 1000 OS)
Ocean Solutions Master & Internship Program, 200,000 USD
K-12 Ocean Innovation & Entrepreneur Camps, 60,000 USD plus in-kind
UN Decade Ocean Solutions Report 100,000 USD (estimate to be revised)
Ocean Solutions Knowledge to Action Network 40,000 USD (in-kind contribution OKAN)

Recurrent Annual Expenses (Total = 450,000 USD/year)
GEOS Project Office
- Supplies and Travel, 20,000 USD
- Salary Executive Secretary, 135,000 USD
- Staff Support, 80,000 USD (plus in-kind OV, FS)

Early Career Fellows, starting at 70,000 USD
Ocean Solutions Expert Network, 20,000 USD (in-kind contribution OV)
Annual Summits, 125,000 USD (in-kind contribution AGU, OV, FS, and others)
GEOS Steering Committee (in-kind contribution from all partners)

Legend of Acronyms:
OV = Ocean Visions
FS = Future Seas
OCP = Ocean Climate Platform
AGU = American Geophysical Union
ONC = Ocean Network Canada
INCOIS = Indian National Centre for Ocean Information Services
PICES = North Pacific Marine Science Organization
OKAN = Ocean Knowledge-Action Network
1000 OS = 1000 Ocean Startups coalition

12. Percentage of estimated budget that is secured

Activities Budget. We have secured 50% (**500,000 USD** out of 1,000,000 USD) of the budget through in-kind contributions from the initial partnering organizations. The remaining part of the budget (50%, ~500**,000 USD**) is for special activities that include the ocean solutions living report, the master program, and K-12 modules. These activities are not critical for the launch of GEOS but will become important to expand the Programme's outreach and impact. Once the program is established, we will be in a better position to secure the necessary sources of funding to cover these additional efforts.

Recurrent Annual Budget. For the recurring annual expenses, we have secured 32% (145,000 USD out of 450,000 USD). We anticipate advertising an open call for establishing the project office (51% ~ **225,000 USD**) and are confident that we will be able to identify a sponsoring organization within year 1. We also begin preliminary conversation to co-host the project office with the Ocean KAN, who has received several proposals to host their international office. The budget allocated for the EC Fellowships, 15% (~70,000 USD, this amount will increase as we secure multiple fellowships), will be secured through fund raising as GEOS becomes operational.

13. Secured funding sources

All contributions to date are in kind (see section 11 to determine the sources).

* 14. Do you require support to find additional resources for your Decade Programme?

Yes

* 15. Would you like to be put in touch with partners working on similar issues or proposing Decade Actions that could have synergies with your proposed Action?

Yes

* 16. Countries in which the proposed Decade Programme will be implemented

GEOS is a global program that will direct its activities to where there is a clear need for the deployment of solutions. The initial projects of GEOS will focus their activities in the Africa/North Atlantic, Oceania, North Pacific, and India regions (see question 19) with a view that once solutions reach scalable and deployable stages they can be more widely applied. Within the GEOS initial coalition, the following countries are represented through the partnering organizations: USA, Australia, South Africa, China, Russia, Canada, South Korea, India, Japan, Italy, Germany, United Kingdom, Ireland, Spain, Norway, Portugal, and France. As GEOS implementation begins, we anticipate expanding the partners and representation especially for the regions of South America and Africa (although several partners are working in this region already with local organizations and communities).*

17. Ocean basins in which the proposed Decade Programme will be implemented

Indian Ocean, North Pacific Ocean, South Pacific Ocean, North Atlantic Ocean, South Atlantic Ocean, Arctic Ocean, Antarctic Ocean.

SECTION 2. DESCRIPTION OF THE PROPOSED DECADE PROGRAMME

* 18. What is the high-level objective(s) of your proposed Decade Programme?

The ocean research community has long understood the current ocean threats and crises. However, because of disciplinary, sectorial, and geopolitical silos, this scientific knowledge has often failed to be transformed into scalable ocean solutions that support a sustainable and equitable blue economy and help mitigate and reverse the effects of climate change. To overcome the persistent gap between ocean research and solutions, we propose establishing a **Global Ecosystem for Ocean Solutions (GEOS)** as a flagship Programme of the United Nations Decade of Ocean Science for Sustainable Development.

The high-level objective of GEOS is to:

"*establish a vibrant, global 'ocean solutions' community of researchers, innovators, investors, decision-makers, and other stakeholders to co-design and co-deploy equitable, durable, and scalable ocean-based solutions for climate change and ocean grand challenges.*"

Such an integrated, global, inclusive community currently does not exist for enacting and implementing ocean solutions with most efforts fragmented and scattered resulting in an inability to reach a system-level approach to solutions.

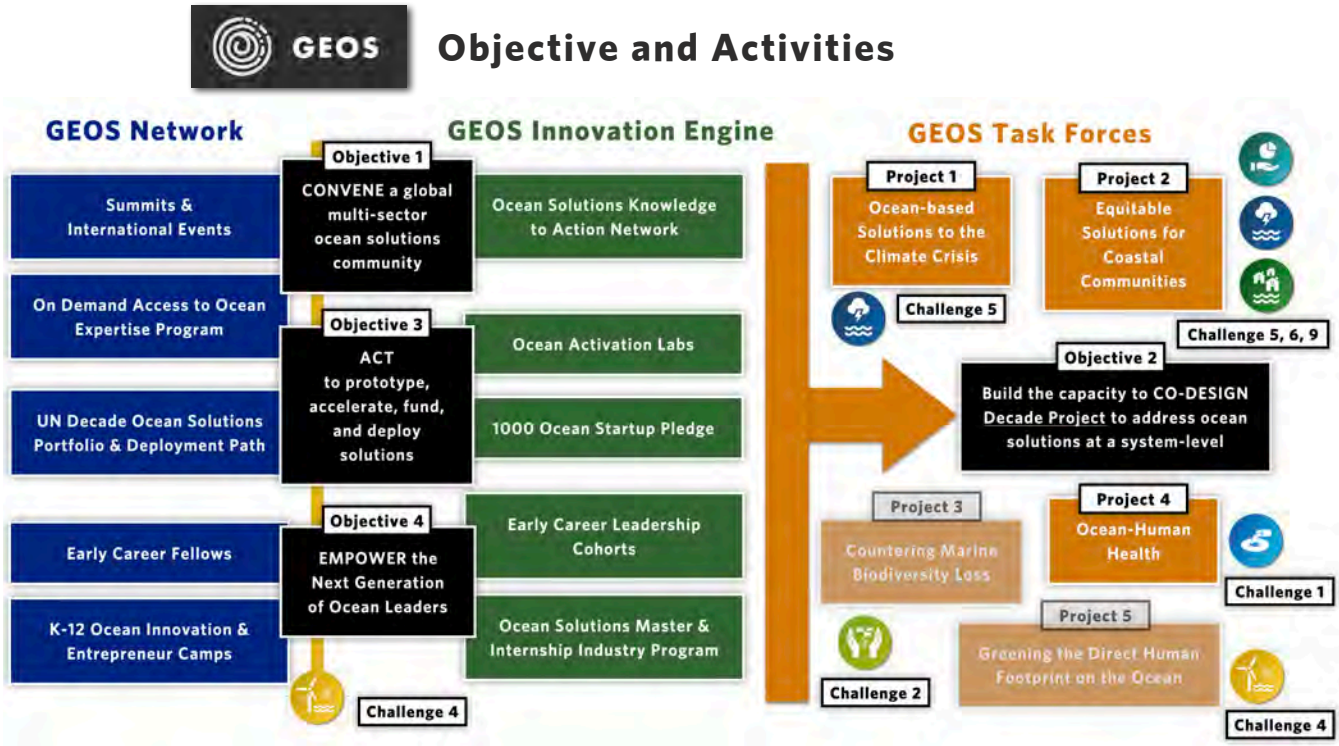
To achieve this GEOS has set out four objectives:

- **Objective 1.** Convene a global multi-sector community focused on co-designing ocean solutions and in doing so establish the **GEOS Network**.
- **Objective 2.** Build the capacity for co-developing new decade projects to address equitable system-level ocean solutions (e.g. ocean carbon dioxide removal, equitable coastal solutions, etc.) through multi-sector **GEOS Task Forces**.
- **Objective 3.** Act to prototype, accelerate and fund ocean science-based solutions with creation of new businesses and investments for the ocean economy through the **GEOS Innovation Engine**.
- **Objective 4.** Empower, connect and train the next generation of ocean leaders and professionals.

To accomplish these objectives, the Programme will develop the **GEOS Network**, the **GEOS Innovation Engine**, and the **GEOS Task Forces** as the building blocks of an ecosystem for ocean solutions that links research, development, and deployment processes within a unified framework. These ecosystem components are both a means to accomplish GEOS's objectives but also a key outcome of GEOS (see section 19) in that they will expand the functionality of the Ocean Decade and its ability to effectively transform knowledge into solutions.

Core Values & Geographical Scope. GEOS strives to cultivate a diverse, equitable, just, and inclusive community of researchers and practitioners around the world focused on solutions for a healthy and sustainable ocean. We aim to provide an inclusive voice for the role of ocean solutions in addressing societal needs. As such GEOS will work to expand the Network and Innovation Engine geographically to include and give voice to communities and efforts in other continents who are not explicitly represented in the initial set of partners. These include Africa, South

America, and others. Countries from these continents are already involved in several activities of the partnering organizations.



*** 19. What are the key expected outcomes of your proposed Decade Programme?**

Through the GEOS synergistic ecosystem functions and activities, this Programme will provide a coordinated framework that will result in the development and deployment of system-level ocean solutions at national and international scales. In doing so it will build the necessary capacity to address these challenges. Already GEOS has established the beginnings of its **GEOS Network** (see current partners below) and **GEOS Innovation Engine** (see current partners below) and initiated two key focal areas of work being carried out by **GEOS Task Forces**. These ecosystem functions and their work are together a key outcome of GEOS in terms of (1) establishing new processes that accelerate the transformation of knowledge into ocean solutions and (2) in delivering specific ocean solutions at scale.

CONVENE – The GEOS Network

By combining and expanding the existing networks of the GEOS partners, this Programme will have built by the end of the Ocean Decade a multi-sector and multidisciplinary ocean solutions community. This GEOS Network will be comprised of members from the academic research, private, and public sectors, and will provide a trusted forum for transforming research into solutions and actions that address the needs of stakeholders, decision-makers, and society. The following partners, who already host several events that are focused on ocean solutions, have committed to the network: ***Ocean Visions (USA), Future Seas (Australia), North Pacific Marine Science Organization (PICES) (Canada, Russia, China, South Korea, Japan, USA), IOC-UNESCO (International), Ocean Knowledge-Action Network (International), Ocean and Climate Platform (OCP) (France), and Ocean Networks Canada (OCN) (Canada)***, and those involved in the GEOS Innovation Engine will also contribute to the network. The Programme will continue to expand the number of partners as it progresses throughout the Decade, increasing diversity and building both its multi-disciplinary and multi-stakeholder components. Through the ***American Geophysical Union (AGU)***, which will help coordinate the logistical aspects associated with the convening of the GEOS Network events and summits, further professional societies will be engaged in the network including the European Geophysical Union (EGU), the Marine Technological Society (MTS), the Japan Geoscience Union, ASLO, and

others.

In association with the ***Ocean Decade's Early Career Ocean Professionals (ECOP)*** network, the activities of the GEOS Network will expand the production of the next generation of ocean leaders via activities that provide for the engagement, training, and support mentorship of younger generations, early career ocean professionals, and underrepresented communities. Section 20 articulates in more detail the activities and efforts related to ECOP.

ACT – the GEOS Innovation Engine

The GEOS Innovation Engine, comprising networks of incubators, accelerator programs, hybrid innovation platforms, and funders, will be the driving force in implementing and deploying the ocean solutions developed via the GEOS Task Forces. Through the Innovation Engine, we envisage that the Programme will create technologies, innovations, and businesses that can be used to drive new company development for sustainable economic growth by the end of the Ocean Decade while advancing system-level ocean-based solutions. The outputs from the Innovation Engine will produce mechanisms for establishing livable wages, inspire and support young researchers and entrepreneurs in ocean technologies, and ensure that solutions developed during the Ocean Decade are adopted by existing organizations in the oceans space, and/or decision-makers (elected officials and ocean and coastal managers) at different scales.

The following partners and organizations are jumpstarting the Innovation Engine (see also section 20 for specific activities): ***1000 Ocean Startups*** coalition recognized by the High Level Panel for a Sustainable Ocean Economy led by OceanHub Africa, Blue Oceans Partners, Katapult Ocean, Investable Oceans, Conservation International Ventures, World Economic Forum Uplink, Ocean Exchange, AiiM Partners, Schmidt Marine Technology Partners, S2G Oceans, TOOL, SeaAhead, WPPG, and Hatch. The ***BlueTech Cluster Alliance***, which includes Cornwall Marine (UK), Forum Oceano (Portugal), GCE Ocean Technology (Norway), Irish Maritime Development Office (IMDO) (Ireland), Oceans Advance (Canada), Ocean Futures Innovation Hub and Cluster (Canada), PLOCAN (Spain), Pole Mer Bretagne Atlantique (France), Pole Mer Mediterranee (France), TMA BlueTech™ (US), Marine South East (UK)

CO-DESIGN – the GEOS Projects conducted by Multi-sector Task Forces

The co-creation of ocean solutions that integrate innovations from the sciences, technology, business, governance, and finance will be supported through the creation of a set of GEOS Multi-Sector Task Forces. These community-driven and dynamic processes will bring together researchers, innovators, investors, stakeholders, NGOs, and decision-makers to co-develop actionable roadmaps for designing and implementing system-level solutions. These task forces will be a mechanism for designing new Decade Projects.

The development of the Task Forces will be further guided by NGOs and IGOs such as the ***Ocean Conservancy, IOC-UNESCO***, and the ***Ocean Knowledge-Action Network***, and will leverage new and existing structures under the Ocean Decade. This inclusive and multi-sector co-design of GEOS Decade Projects is both an objective and outcome of GEOS. As such, we cannot a priori specify all the Task Forces and Decade projects that will be developed under this effort. Two task forces are already established focusing on two main themes: ocean-based solutions to climate change (**Task Force 1**) and equitable coastal solutions for adaptation and resilience (**Task Force 2**). The work of these task forces will ensure early outputs and development of ocean solution outcomes for the Ocean Decade. In these Task Forces, GEOS is collaborating with other Programmes being proposed under the Ocean Decade, including CoastPredict to design transformative paths from research to solutions.

Task Force 1: Ocean-Based Carbon Dioxide Removal (CDR)

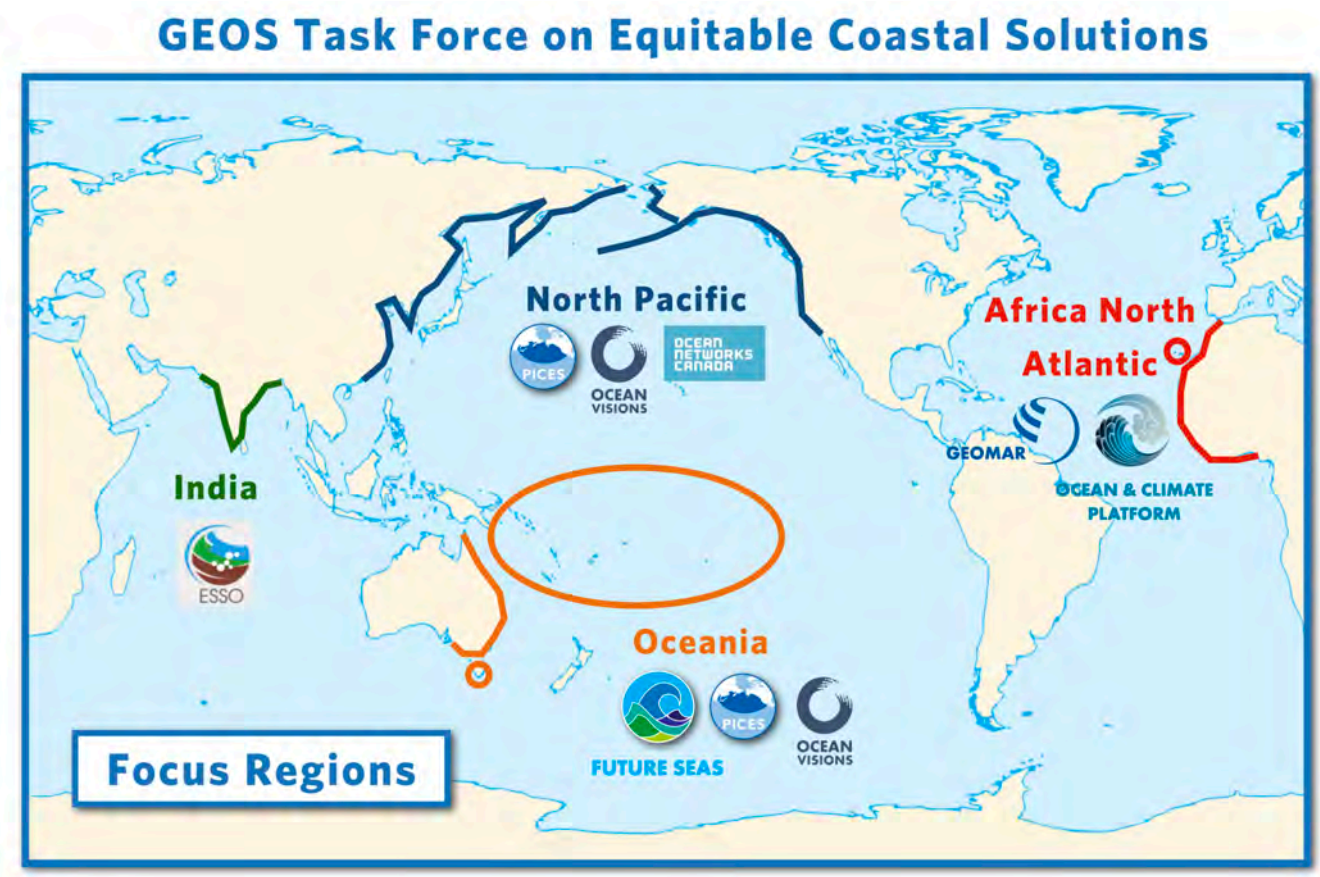
The goal of the CDR Task Force is to develop carbon dioxide removal solutions that are scalable, and environmentally and socially acceptable. ***Ocean Visions, Ocean Network Canada, PICES***, and other leading members are already facilitating an open process to engage global actors across diverse disciplines and sectors that will collaboratively develop detailed, "living" road maps to advance promising ocean-based carbon dioxide removal (CDR) approaches. The road maps being developed identify the current state of technology readiness, the scale potential for CDR, key uncertainties, obstacles, opportunities, and priorities from a range of perspectives and disciplines, including natural

sciences, engineering, policy, governance, economics, social equity, and others. They are grounded in an evidence-based, precautionary approach towards implementation. In doing so, the road maps will identify critical paths for accelerating the development and testing of various ocean-based CDR approaches. Approaches currently being considered include (1) ocean alkalinity enhancement, (2) macroalgal cultivation and sequestration, and (3) electrochemical methods of carbon capture from seawater with further approaches potentially also being considered as the work of the Task Force progress. The Grantham Environmental Trust (GET), Climate Works Foundation, and Schmidt Family Foundation have provided and committed resources/funds to support and scale projects in this area. A key outcome from this Task Force will be progressing solution development leading to a successive Decade Project that will serve as an international platform to mobilize ocean-based carbon dioxide removal action of local governments and states. (Examples of draft roadmaps developed through a series of international workshops hosted by Ocean Visions are available here https://www.oceanvisions.org/task-force-ocean-cdr).

Task Force 2: Equitable Coastal Ocean Solutions

The goal of the Equitable Coastal Solutions Task Force is to develop a set of services and technologies for under-represented and Indigenous coastal communities to enhance resilience and adaptation to the growing human and climate pressures and risks. One of the key challenges in coastal solutions is that research and action on resilience and adaptation of coastal communities to climate change has typically focused on specific issues such as sea level and extreme events, and is rarely synergistic with other efforts looking at coastal systems in the context of ocean carbon dioxide removal (e.g., blue carbon), food security, ocean-based renewable energy, and ecosystem restoration/marine conservation (e.g., reduction of harmful algal blooms). A key outcome of this task force will be establishing synergies between a diverse set of efforts that aim at developing coastal solutions.

Coordinated through ongoing efforts by the ***Ocean-Climate Platform, Ocean Visions, PICES, Future Seas, INCOIS, Ocean Network Canada***, and ***CoastPredict*** (another UN Decade Programme Proposal), this task force will develop a series of roadmaps for implementing coastal solutions that are accessible and deployable across a range of local communities including under-served and Indigenous communities (note: Future Seas, Ocean Network Canada, and PICES, have already working relationship with a vast network of Indigenous communities across the Pacific Ocean). These roadmaps will be developed and implemented through a series of synergistic Decade Projects organized by regional focus and/or by themes. To this end, this task force will initially leverage the GEOS to conduct landscape studies of current coastal solutions work in four focus regions where there is existing capacity through the initial partner's programs: **(1) Africa North Atlantic** (including North and West Africa, Cape Verde Islands) through the ***Ocean-Climate Platform*** and ***GEOMAR***, **(2) Oceania** (including Pacific Islands and Australia) through the ***Future Seas***, ***PICES*** and ***Ocean Visions***, **(3) North Pacific** (including the coastal systems of Russia, Japan, China, North America) through ***PICES, Ocean Network Canada***, and ***Ocean Visions***, and **(4) India** (including Gujarat, Maharashtra, Goa, Karnataka, Kerala, Tamil Nadu, Andhra Pradesh, Odisha, West Bengal) through ***INCOIS***. Through these landscape studies, emerging shared issues, synergies, best practices, and opportunities for greater collaboration amongst communities will be identified and will inform the co-design of regional Decade Projects that will implement the roadmaps developed. These regional Decade Projects will test and implement new scientific concepts and technologies for monitoring and predictions incorporating the CoastPredict general framework for understanding the global coastal ocean.



To support the further development of the GEOS Network, the GEOS Innovation Engine, and the GEOS Task Forces, a series of sessions of the task forces will be held at the Ocean Visions Summit 2021, which will occur across four international campuses in Hobart (Australia), La Jolla (USA), Cape Town (South Africa) and Mindelo (Cape Verde) (see https://www.oceanvisions.org/summit-2021).

Timeline of Outcomes

By **year 5** we anticipate that through further development of the GEOS Network and GEOS Innovation Engine, the Programme will have achieved:

1. a thriving forum for ocean solutions that integrates research innovations into solution models,

2. greater alignment of the research community with users to scale solutions with policy/management actions and sustainable businesses, and

3. delivery of the first set of projects (outlined also in section 20) and development of a number of additional projects focused on providing solutions required for achieving the societal outcomes outlined in Ocean Decade Implementation Plan.

4. In collaboration with the ***Ocean Decade's Early Career Ocean Professionals (ECOP***) network, delivery of the first round of (i) Early Career (EC) Leadership Cohorts; (ii) EC Fellows; (iii) the Innovation & Entrepreneurs Camps; and (iv) a free access virtual Ocean Solutions Master (led by ***Ocean Visions*** and ***Future Seas***) linked to an Internship Industry Program (led by ***BlueTech Cluster Alliance***).

By **year 10** we envision delivery of a set of ocean-based solutions, supported through business, governments, and communities that are assisting in achieving significant mitigation of the effects of anthropogenic change on the

human-ocean system and thriving, equitable ocean economies and communities.

*** 20. Please describe the activities that will be implemented as part of the proposed Decade Programme**

GEOS Activities grouped by Objectives

**Each activity (A1-A13) is followed by the year when it will begin.*

Objective 1. CONVENE a global multi-sector ocean solutions community

A1. Summits & International Events: Summits & International Events: A recurrent annual Ocean Solutions Summit will be held across multiple international campuses. The first summit is planned for May 2021 https://www.oceanvisions.org/summit-2021, co-hosted by Scripps (USA), University of Tasmania (Australia), Cape Town University (South Africa), and GEOMAR (Germany). Other international events will be organized by the partners (e.g. the launch of the 1000 Ocean Startup coalition and pledge) to advance the various elements of GEOS. (**Year 1**)

A2. Ocean Solutions Knowledge to Action Network: On request of the industry partners, GEOS will establish, through the Ocean KAN and the BlueTech Cluster Alliance, a network that connects ocean solutions researchers with industry partners and startup companies globally (see also A4). (**Year 2**)

Objective 2. ACT to prototype, accelerate, fund, and deploy solutions

A3. On Demand Access to Ocean Expertise Program: A jointly develop ocean solutions expert network portal and a set of processes that allow the broader community (e.g., innovators, investors, businesses, decision-makers, etc.) to request (1) access to domain experts and (2) peer review of the science, technology, governance, and finance elements of new proposed solutions. (**Year 1**)

A4. 1000 Ocean Startup: A coalition of incubators, accelerators, and venture capitalists recognized by the High-Level Panel for a Sustainable Ocean Economy that will use the GEOS Network research pipeline to support and invest in 1,000 game-changing startups in the next 10 years to restore ocean health – in line with SDG 14. (**Year 1**)

A5. Ocean Activation Labs: A set of events and programs conducted by the GEOS Innovation Engine to (1) train researchers and innovators to develop sustainable businesses or (2) connect researcher with external teams that will transition the research into sustainable ocean solutions. (**Year 2**)

A6. UN Decade Ocean Solutions Portfolio & Deployment Path: A living report of the landscape studies and roadmaps developed by the GEOS task forces to help the broader community synergize and access resources for ocean solutions. This activity will feed into the State of the Decade Reports (**Year 3**)

Objective 3. Build the capacity to CO-DESIGN Decade Projects to deploy system-level ocean solutions. This objective is accomplished through the GEOS Task Forces.

A7. Task Force on Ocean-based Solutions to the Climate Crisis (see section 19) (**Year 1**)

A8. Task Force on Equitable Solutions for Coastal Communities (see section 19) (**Year 1**)

A9. Other Task Forces in discussion and development include: Ocean and Human Health, Countering Marine Biodiversity Loss, Greening the Direct Human Footprint on the Ocean, and Reducing Plastic Pollution (**Year 2-4**)

Objective 4. EMPOWER the Next Generation of Ocean Leaders

A10. Early Career (EC) Leadership Cohorts: A program to include EC in all the leadership structures of GEOS to ensure an on-hands training and transition of EC into the next generation of ocean leaders (e.g. learning by doing). (**Year 1**)

A11. Early Career (EC) Fellows: Fellowships for EC professionals and leaders to engage in GEOS activities and task forces. (**Year 2**)

A12. Ocean Solutions Master & Internship Industry Program: Online-free access master program co-developed by the academic institutions in the GEOS Network ***(e.g. Ocean Visions, Future Seas)*** to expand access to ocean solutions training with direct engagement in GEOS. The master program will be linked to an industry internship program in collaboration with the ***Blue Tech Cluster Alliance***. (**Year 3**)

A13. K-12 Ocean Innovation & Entrepreneur Camps: A set of educational modules to train, inspire, and bring awareness to younger students in the field of ocean science through a lens of ocean solutions and innovation. (**Year 5**)

* 21. Please describe the theory of change that underpins your proposed Decade Programme i.e., how will the activities being carried out achieve the outcomes and objectives that you envisage

The ocean research community has built an awareness of the current ocean threats and crises over time so that many of the challenges facing the ocean and achieving sustainable development are well articulated. However, because of many disciplinary, sectoral, and geopolitical silos, this scientific knowledge has often failed to be transformed into scalable ocean solutions that are required for addressing these challenges and achieving a sustainable and equitable blue economy.

The Global Ecosystem for Ocean Solutions (GEOS) program is designed to break down the silos that exist among these organizations, thereby linking research, development, and deployment processes within a unified framework. Members of GEOS (which will continue to grow during the Ocean Decade and facilitate partnerships beyond the Ocean Decade) are committed to all stages of the research, co-design, and deployment of solutions, and through GEOS will develop a shared vision and plan for achieving equitable, scalable outcomes. The initial focus of GEOS will be on developing solutions for reducing ocean carbon dioxide concentrations and developing services and tools for holistic adaptation approaches for coastal communities.

Since a non-siloed, research-centered community for developing global oceans solutions does not yet exist, we have gathered a number of international research and education institutions, accelerator, venture funds, NGOs, governmental organizations, and industries with a strong focus on ocean science, policy, and engineering to jumpstart GEOS and its three main elements: The GEOS Network, the GEOS Innovation Engine, and the GEOS Task Forces. The three elements of GEOS are designed as a distributed self-sustained model driven by bottom-up processes that leverage the GEOS Programme to amplify the impact of GEOS' projects and initiatives, and create

synergies across efforts focused on ocean solutions. By aligning efforts, GEOS will reduce fragmentation and repetition that arise from not having an integrated global ocean solutions community.

Finally, there is a strong recognition that the future of ocean solutions is in the hands of the next generations, who will carry forward these efforts. As such, GEOS, through its various activities (e.g. A10 – A13) and the guidance of the Ocean Decade ECOP, is intentionally and proactively training and engaging early career professionals and leaders in the development, deployment, and management of the Programme.

* 22. Will your proposed Decade Programme enhance the sustainability of ocean science initiatives, including infrastructure or individual / institutional capacity, in light of the current Covid-19 pandemic?

Yes

23. If yes, how will your proposed Decade Programme enhance the sustainability of ocean science initiatives, including infrastructure or individual / institutional capacity, in light of the current Covid-19 pandemic?

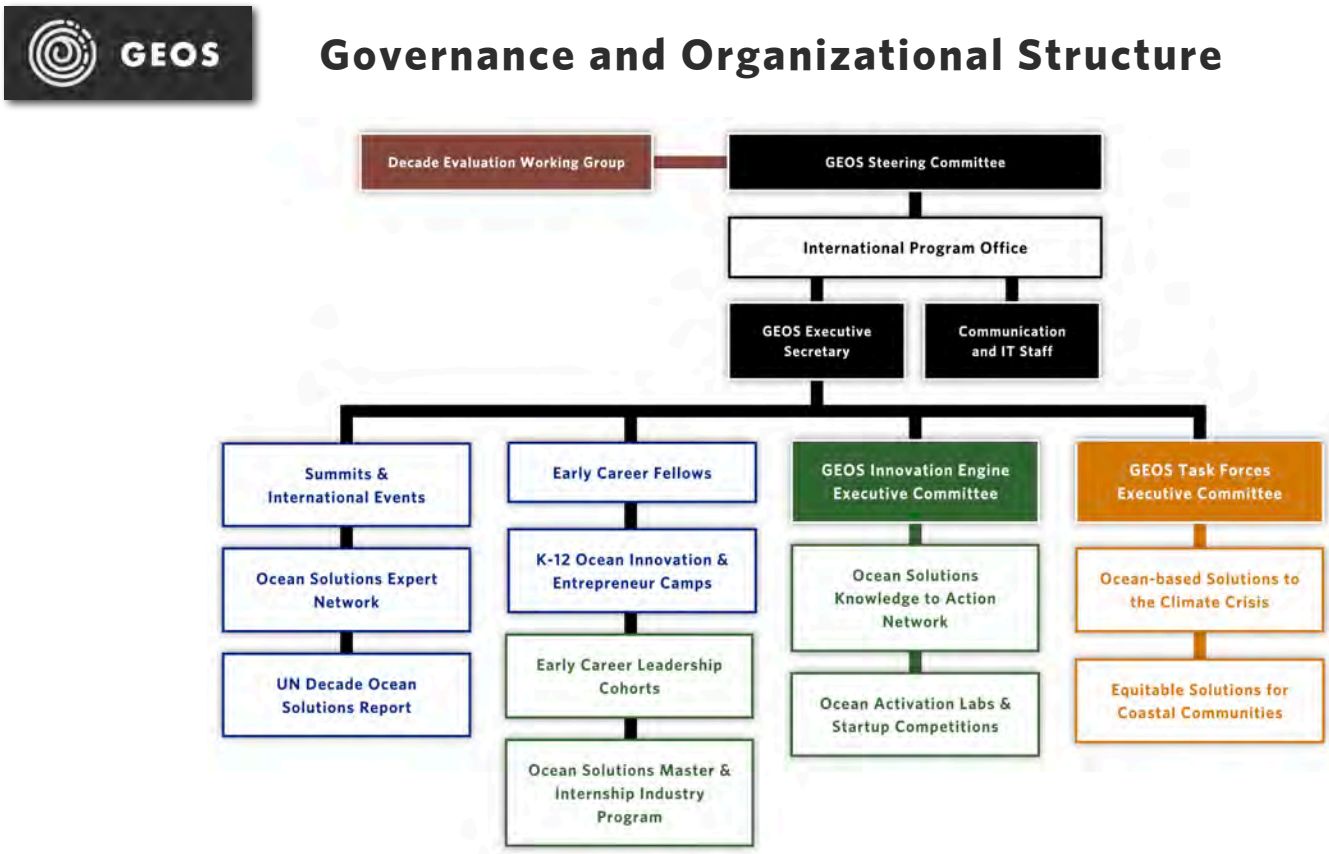
GEOS is based on a distributed model that is driven by its members and communities. This approach is inherently resilient to crises such as the Covid-19 pandemic because coordination and integration of existing and new efforts can be efficiently accomplished via virtual environments. In fact, the connectivity via virtual formats has proved critically important for bringing the GEOS diverse community together and coordinating the work of GEOS initial task forces.

Both during and beyond the pandemic, GEOS will continue to utilize virtual formats to provide the inclusive and interactive platforms being called for under the Ocean Decade in order to support ideas generation and the development of GEOS' task forces. An early example of this, the Ocean Visions Summit 2021 (see A1 in section 20), will be a virtual, geographically distributed event held across four international campuses aimed at supporting equal access and voice to the different communities and stakeholders.

By continuing to develop virtual systems for supporting the activities of GEOS, the Programme will build a resilient and inclusive network of multi-sector communities and partners that can continue to develop and deliver ocean solutions, ensuring the sustainability of the frameworks required for delivering into the Ocean Decade and beyond.

* 24. Please describe the coordination / management structure for the proposed Decade Programme

A diagram with the organizational and management structure of GEOS is available on Slide 5 of supplemental material and is summarized below.



The GEOS Steering Committee is the primary structure for providing guidance on all aspects of the GEOS Programme. The steering committee will work in close collaboration with the UNESCO-IOC and the Decade Evaluation Working Group to integrate the GEOS functions into existing decade structures to increase the efficiency of the GEOS effort and minimize duplication of efforts. Members of the GEOS Network will be represented in the Steering Committee and a process for expansion and rotation on the committee will be developed during year-1 together with a set of Terms of Reference.

Under the supervision of the GEOS Steering Committee, an **International GEOS Program Office**, with an Executive Secretary and communication/IT staff, will be the primary structure for the coordination and implementation of the GEOS Network, Innovation Engine, and Task Forces. The program office will also have direct supervision of the activities listed below (and described in section 20): summits and international events, ocean solutions expert network, UN ocean solutions report, early career fellows and leadership cohorts programs, the ocean solutions master and internship programs.

The GEOS Innovation Engine will have its own Executive Committee (with some of these members sitting on the GEOS Steering Committee) to oversee and integrate specific activities in the GEOS framework such as the development of the ocean solutions knowledge to action network and the activation labs. This executive committee will report to the international program office and the co-chairs will be members of the Steering Committee.

The GEOS Task Forces will have their own Executive Committee (with some of these members sitting on the GEOS

Steering Committee) comprised of the co-chairs of the individual task forces. This committee will oversee the logistical and coordination aspects of the task forces under the supervision, and with the support of the International Program Office. The chairs of the executive committee will be also members of the Steering Committee.

The governance and organizational structure model outlined here will necessarily be revised in conversations with the IOC-UNESCO to ensure optimal integration and alignment of functions with the decade structure and other Programme's in development from other groups.

SECTION 3. CONTRIBUTION OF PROPOSED DECADE PROGRAMME TO THE UN DECADE OF OCEAN SCIENCE FOR SUSTAINABLE DEVELOPMENT (REFER TO THE OCEAN DECADE IMPLEMENTATION PLAN FOR DETAILS)

* 25. To which Sustainable Development Goal(s) (SDG) will your proposed Decade Programme contribute? Please select a maximum of three SDGs

- **GOAL 13: Climate Action**
- **GOAL 14: Life Below Water**
- **GOAL 17: Partnerships to achieve the Goal**

* 26. How will your proposed Decade Programme will contribute to the SDGs selected? Please Explain

GOAL 13: Climate Action. GEOS initial task forces evaluate and develop roadmaps to deploy options for carbon dioxide removal solutions. These roadmaps will be used to inform the development of new Decade Projects that aim at delivering solutions addressing carbon dioxide removal that are scalable, and environmentally and socially acceptable, and equitable.

GOAL 14: Life Under Water: The primary focus of GEOS is to facilitate and enact the development of ocean-based solutions that address current challenges faced by the ocean, and in doing so secure a sustainable ocean future. Through its initial task forces, GEOS will develop equitable tools and services that will build resilience in coastal communities against the rising threats of climate change and other human pressures.

GOAL 17: Partnerships to achieve the Goal. The entire GEOS Programme is designed to establish a vibrant, global multi-sector 'ocean solutions' community and partnerships to co-design and co-deploy equitable, durable, and scalable ocean-based solutions for addressing challenges set out under the Ocean Decade and achieving a sustainable blue economy. Through the GEOS Network, the GEOS Task Forces, and the GEOS Innovation Engine, GEOS will forge partnerships that do not currently exist, linking research, development, and deployment processes within a unified framework.

* 27. How will your proposed Decade Programme contribute to the vision and mission of the Decade?

The Ocean Decade Implementation Plan states "create the conditions for designing and delivering the qualitative and quantitative ocean knowledge to inform solutions". GEOS expands this goal to move from "informing" solutions to transforming science and engineering into the "deployment" of solutions. We anticipate that GEOS will contribute to the following functions:

(1) ***Establish an efficient multi-sector ecosystem to transform knowledge into co-designed and co-deployed system-level ocean solutions.*** Ocean solutions require breaking down the silos that exist among research universities and institutions, professional ocean-focused societies, NGOs, IGOs, foundations, government agencies, business, and financial institutions, and ocean innovation platforms, thereby linking research, development, and deployment processes within a unified framework. Breaking these silos requires an intentional set of processes that bring these multi-sector communities together to build a shared vision and goals for solutions, and that enable the co-design and deployment of solutions. The GEOS ecosystem is intentionally designed with this goal in mind through the synergistic activities of the Network, Task Forces, and Innovation Engine. Without a purposeful and intentional pathway that connects ocean knowledge to the development and delivery of ocean solutions, there is a

risk that the Ocean Decade will under-deliver on major challenges set out in its Implementation Plan (see next paragraph).

(2) ***Ocean-based solutions need to be defined as a central target for delivering the societal outcomes set out under the Ocean Decade.*** Ocean-based solutions to the climate crisis require a trans-disciplinary approach. This means that we cannot rely on pulling together solutions emerging from different Ocean Decade activities to accomplish solutions to system-level threats. We need to proactively engage in a multi-sector co-design and deployment process where each sector develops solutions with a shared solution goal from the start. Leveraging the GEOS Network and Innovation Engine, the GEOS Task Forces provide the platform to explicitly enable this trans-disciplinary approach for co-designing new Ocean Decade efforts that aim at deploying system-level solutions to climate (e.g., carbon dioxide removal and coastal solutions task forces). In doing so, GEOS will also accelerate the development of new ocean sustainable businesses. However, it is important to recognize that a sustainable blue economy without coordination and awareness for system-level solution goals will not deliver ocean-based solutions to climate at the scale that is necessary. The GEOS Task forces aim at developing the capacity to make the ocean-climate solutions a central and primary goal of the multi-sector efforts.

* 28. To which Decade outcome(s) will your proposed Decade Programme contribute?

- **Outcome 3**: A productive ocean supporting sustainable food supply and a sustainable ocean economy.
- **Outcome 5**: A safe ocean where life and livelihoods are protected from ocean-related hazards.
- **Outcome 6:** An accessible ocean with open and equitable access to data, information and technology and innovation.

* 29. How will your proposed Decade Programme contribute to the Decade outcomes selected?

Outcome 3: A key goal of GEOS is to develop an ecosystem that allows transforming research and diverse sources of knowledge into ocean solutions and sustainable businesses. Through the GEOS Innovation Engine, this Programme will advance and improve the sustainable blue economy.

Outcome 5: GEOS Task Forces are focused on identifying solutions that will enable carbon dioxide removal and provide equitable services/tools for building resilience in coastal communities. The outcomes of the GEOS task forces will thereby reduce current threats associated with climate change and ensure that communities are better prepared for hazards related to sea-level rise, flooding, extreme events, and the consequent disruptions of marine and coastal ecosystem services.

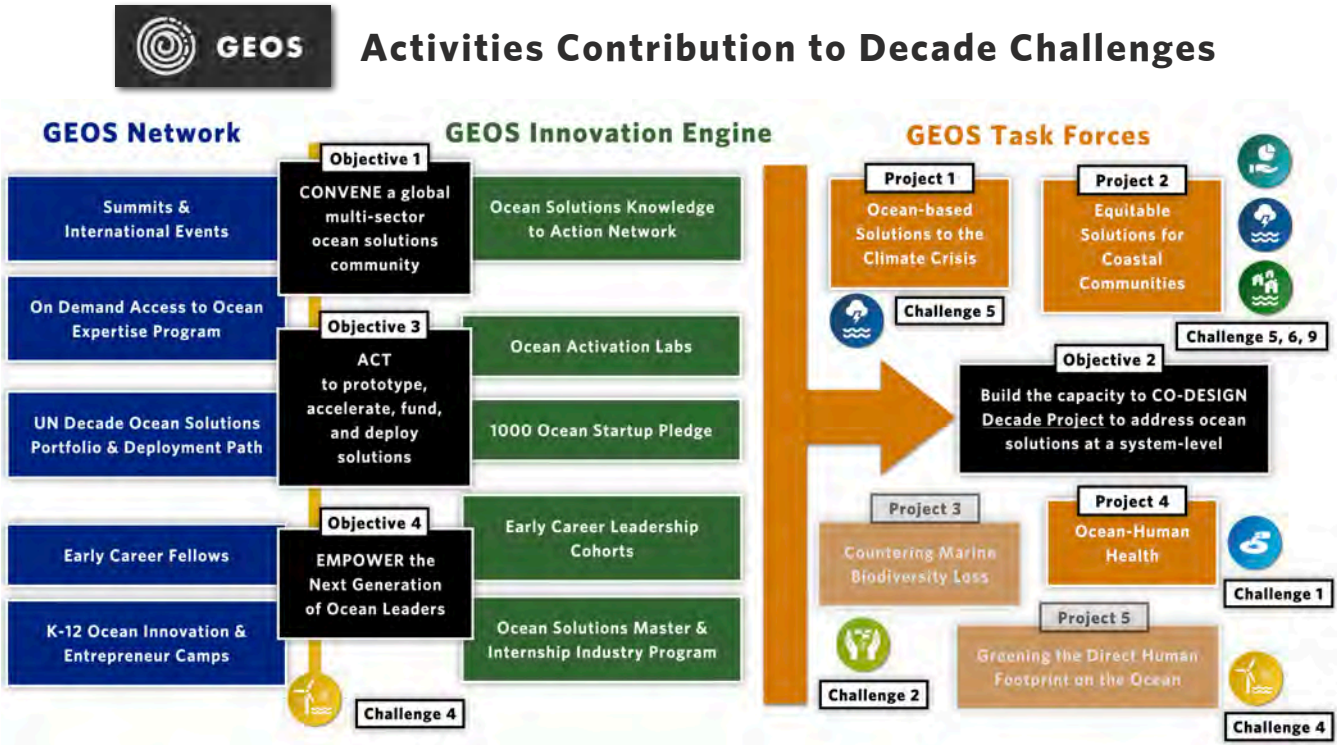
Outcome 6: GEOS advances the development of equitable coastal solutions services and technologies for under-represented and Indigenous coastal communities to enhance resilience and adaptation to the growing human and climate pressures. The GEOS Ocean Solutions Portfolio & Deployment Path knowledge will be available to ensure efforts are synergized and fragmentation reduced.

As further GEOS Task Forces and associated projects are developed it is envisaged that GEOS will contribute to a broader range of outcomes.

*** 30. To which Ocean Decade Challenge(s) will your proposed Decade Programme contribute?**

- **Challenge 4**: Generate knowledge, support innovation, and develop solutions for equitable and sustainable development of the ocean economy under changing environmental, social and climate conditions.
- **Challenge 5**: Enhance understanding of the ocean-climate nexus and generate knowledge and solutions to mitigate, adapt and build resilience to the effects of climate change across all geographies and at all scales, and to improve services including predictions for the ocean, climate and weather.
- **Challenge 6**: Enhance multi-hazard early warning services for all geophysical, ecological, biological, weather, climate and anthropogenic related ocean and coastal hazards, and mainstream community preparedness and resilience.
- **Challenge 9**: Ensure comprehensive capacity development and equitable access to data, information, knowledge and technology across all aspects of ocean science and for all stakeholders.

*** 31. How will your proposed Decade Programme contribute to the Decade Challenges selected?**



GEOS activities contribute to Challenges 4, 5, 6, 9, recognizing that as further projects as associated Task Forces are established, GEOS will contribute to addressing a wider range of challenges.

In response to **Challenge 4**, the synergistic activities of the GEOS Network and GEOS Innovation Engine aim at generating and transforming knowledge into ocean solutions that are equitable and that contribute to the development of a sustainable blue economy. The work outputs of the initial GEOS Task Forces focused on identifying solutions that will enable carbon dioxide removal and provide equitable services and tools for building resilience in coastal communities (in coordination with the CoastPredict Programme) will directly contribute to **Challenges 5 and 6**. Furthermore, the Equitable Solutions for Coastal Communities Task Force, by focusing its

efforts across a diverse set of local communities, including under-served and Indigenous communities, will ensure solutions are delivered to those communities that need them the most thereby contributing to addressing **Challenge 9**. Through the Ocean Solutions Portfolio & Deployment Path and objective 4 of the Programme (see section 20) GEOS will further build capacity development in the next generation of ocean leaders addressing **Challenge 9.**

* 32. To which Decade Objective(s) will your proposed Decade Programme contribute? .

- **Objective 3**: Increase the use of ocean knowledge and understanding and develop capacity to contribute to sustainable development solutions.

* 33. How will your proposed Decade Programme contribute to the Decade Objective(s) selected?

Contributions to Objective 3: The GEOS and its the functional elements (Network, Innovation Engine, and Task Forces) are designed to implement a synergistic, multi-sector ecosystem and activities (see sections 18, 19, 20 of this proposal) to transform and accelerate the transfer of knowledge into solutions that address the ocean grand challenges and contribute to the development of sustainable marine circular economies.

* 34. With respect to the Decade Objectives selected above, to which Decade Sub-Objective(s) will your proposed Decade Programme contribute?

- 3.1: Broadly communicate and promote the role of ocean science for sustainable development across diverse stakeholder groups including through formal and information education and an expansion of ocean literacy approaches across stakeholder groups.

- 3.3: Undertake interdisciplinary, multi-stakeholder co-design and co-delivery of ocean solutions including policy, decision making, integrated ocean management frameworks, applications and services, and technology and innovation.

- 3.6: Expand and enhance services, applications and management tools for building and mainstreaming preparedness and adaptive responses to multiple stressors and hazards.

- 3.7: Expand and enhance tools, applications and services that integrate and facilitate use of data, information, and knowledge on ocean-related natural capital including the social, cultural, environmental, and economic characteristics of the ocean.

* 35. How will your proposed Decade Programme contribute to the Decade sub-objectives selected?

The **GEOS Network** activities and its output such as the "living" report UN Decade Ocean Solutions Portfolio & Deployment Path, the Master in Ocean Solutions, and others (*see section 20*) will communicate and educate on ocean science for sustainable development to a broad and diverse stakeholder audience (**sub-objective 3.1**). The **GEOS Task Forces** are designed to enable a multi-sector and multi-stakeholder co-design and co-delivery of ocean solutions (*see section 19 for details*) (**sub-objective 3.3**). The **GEOS Innovation Engine** will expand the application of ocean solutions technologies and strategies (see section 19 for details) (**sub-objective 3.6**). Collectively the activities of GEOS will integrate data and knowledge of the different ocean dimensions to protect, expand, and enhance ocean services (**sub-objective 3.7**).

*** 36. Please check which of the following criteria are relevant to your proposed Decade Programme as far as they are relevant to your proposal:**

- Is co-designed or co-delivered by knowledge generators and users, and does it facilitate the uptake of science and ocean knowledge for policy, decision making, management and/or innovation.
- Strengthen existing or create new partnerships across nations and/or between diverse ocean actors, including users of ocean science.
- Contribute toward capacity development, including, but not limited to, beneficiaries in Small Island Developing States, Least Developed Countries and Land-locked Developing Countries.
- Overcome barriers to diversity and equity, including gender, generational, and geographic diversity.
- Collaborate with and engage local and Indigenous knowledge holders.

*** 37. How will your proposed Decade Programme contribute to the Decade criteria selected?**

The GEOS has brought together organizations from different countries to assemble the functional elements of the Programme such as the Network and Innovation Engine, and has also begun initial coordination of the GESO Task Forces, which aim at generating and transforming knowledge towards ocean-based solutions that advance the SDGs (see section 26). In doing so, GEOS is creating, and will continue to create as the Programme unfolds, new partnerships across diverse ocean actors, including users of ocean science, that will co-design and co-deliver innovations and solutions for a diverse set of users and stakeholders (see section 19, GEOS Network and Innovation Engine description of partners and outcomes). Furthermore, central to GEOS's mission is the development of "equitable" solutions. For example, the GEOS Task Force on "equitable coastal solutions", will involve beneficiaries in small islands (e.g. the South Pacific Islands) and least developed countries (North Atlantic coasts of Africa). These efforts will also expand to involve indigenous communities both as beneficiaries and as additional sources of knowledge. Several GEOS partners have ongoing relations with indigenous comminutes in the Pacific Ocean (Future Seas, Ocean Network Canada, and to some extent PICES). We anticipate that these collaborations will grow as the program unfolds because coastal indigenous communities are most affected by the ocean and climate crisis. Last, one of GEOS key objectives is to train and empower the next generation of ocean leaders and experts (see section 18, 19, 20 text on efforts to accomplish this objective).

SECTION 4. COMMUNICATIONS

* 38. Please describe how you plan to communicate about your proposed Decade Programme including the main target audiences and methods of communications.

Given the number of partners and scope of the GEOS, the Programme is targeting a multi-sector audience across the communities of researchers, innovators, investors, decision-makers, and stakeholders. In the development of GEOS our communication strategy has relied on the joint efforts of the initial partners through their mailing lists and the GEOS website www.oceansolutions.org. Together the partners have an audience estimated > 225,000+. However, a more detailed communication plan is pending and necessary to focus on a more targeted section of our audiences. GEOS will develop this plan in coordination with the partners and will provide the UNESCO-IOC a detailed plan after program endorsement. At a minimum, the plan will include:

- An overall communications strategy that conveys the important role of equitable, durable, and scalable ocean-based solutions for climate change, biodiversity, and ocean grand challenges and that generates excitement and wonder and spurs action by amplifying success stories from different sectors and scales throughout the GEOS network
- Support for dedicated communications staff for both strategic (traditional media relationships, press releases, etc.) and digital communications (social media and website)
- Coordination of partner communications around ocean solutions to draw on the existing strengths of GEOS partners
- Engagement of early career ocean professionals in designing and implementing communications
- Coordination with Decade communications to amplify the work of the Decade in ensuring ocean science, knowledge, and action responds to societal needs

* 39. Have you developed a communications strategy or plan as part of your proposed Decade Programme? If so, please attach it as part of the supporting documentation.

No

40. If yes, please attach the communications documents requested.

SECTION 5. SUPPORTING DOCUMENTATION

41. Attach supporting documents.

Copy of this proposal and supplemental documents are available on the GEOS Website, **www.oceansolutions.org**

- GEOS_Proposal_Full.pdf
- GEOS_Slide_Deck.pdf
- GEOS_Support_Letter

* 42. Please confirm that you have completed your form submission:

The GEOS proposal has been uploaded on January 14, 2021 on the Ocean Decade Call for Action form.

APPENDIX. GEOS PARTNERS SUPPORT LETTERS

In the following pages we have collected support letters from the initial GEOS partnering organizations. Each letter contains a more in-depth description of each organization and group.

Dr. **EMANUELE DI LORENZO**
311 Ferst Drive, Atlanta, GA 30332, USA
PHONE: 404•788•8035 FAX: 404•894•5638
WEB: http://www.oceanvisions.org
EMAIL: edl@gatech.edu

OCEAN VISIONS

Atlanta, January 1, 2021

Dear IOC Secretariat,

This letter is to confirm our strong commitment to the Decade Programme Proposal: A Global Ecosystem for Ocean Solutions (GEOS).

This proposal has been built through the engagement with a wide range of participants from diverse backgrounds and is exactly the kind of interdisciplinary and solutions-focused Programme that we endeavor to participate in the design and delivery of the United Nation Decade for Ocean Sustainable Development. Today's challenges in the oceans will only be addressed through innovative, interdisciplinary and co-created programs that ensure diversity of representation and include appropriate consideration of the human elements.

Ocean Visions is a United States non-profit that aims at transforming science and engineering into ocean solutions. It was established by the following academic and non-academic institutions: Georgia Institute of Technology, Stanford University, Massachusetts Institute of Technology, The Smithsonian Institution, Scripps Institution of Oceanography, Woods Hole Oceanographic Institution, Skidaway Institution of Oceanography and University of Georgia, University of California Santa Barbara, Ocean Conservancy, Georgia Aquarium, Monterey Bay Aquarium and Monterey Bay Aquarium Research Institute, Birch Aquarium at Scripps

On behalf of the Ocean Visions Board of Directors,

Emanuele Di Lorenzo
Chairmen, Ocean Visions Board of Directors
Professor, School of Earth and Atmospheric Sciences
Director of Program in Ocean Science & Engineering
Georgia Institute of Technology

CENTRE FOR MARINE SOCIOECOLOGY

IMAS INSTITUTE FOR MARINE AND ANTARCTIC STUDIES

UTAS

18th December 2020

Dear IOC Secretariat,

This letter is to confirm our strong commitment to the Decade Programme Proposal: A GLOBAL ECOSYSTEM FOR OCEAN SOLUTIONS (GEOS).

This proposal has been built through extensive engagement with a wide range of participants from diverse backgrounds and is exactly the kind of interdisciplinary and solutions-orientated programme that we endeavor to participate in the design and delivery of. Today's challenges in the oceans will only be addressed through innovative, interdisciplinary and co-created programmes that ensure diversity of representation and include appropriate consideration of the human elements.

Who we are

The Centre for Marine Socioecology (CMS) brings together disciplinary expertise in physics, law, economics, finance, biology, sociology, psychology, ocean engineering, philosophy and governance from the University of Tasmania's Institute for Marine and Antarctic Studies, College of Arts, Law and Education, the Discipline of Geography and Spatial Sciences, the College of Health and Medicine, the Tasmanian School of Business and Economics, and the School of Technology, Environments and Design, together with the CSIRO and the Australian Antarctic Division (AAD). CMS embraces the extensive knowledge of the traditional owners of Australia, and all around the world, working collaboratively with Indigenous scientists, Elders and knowledge holders to collectively enhance our understanding of our oceans and coasts.

Socioecology is a challenging new area of research that combines multidisciplinary, interdisciplinary and trans-disciplinary components. The demands of a growing human population have necessarily triggered rapid and ongoing 'blue' growth. However, marine ecosystems cannot support ongoing growth without transformational change in their use and governance as well as innovative solutions towards improved understanding, monitoring and protection. To meet the challenge of sustainable oceans, a coordinated, interdisciplinary and transdisciplinary approach is needed. CMS was created out of a common desire to provide the knowledge needed to support the current and future use of our marine coasts and oceans. We bridge research excellence in physical, natural, social sciences and humanities to inform future development of individual sectors such as food production, energy generation, transport, recreational and cultural value. Much of our research has a focus on knowledge that contributes to the achievement of the SDGs and complementary policy frameworks and initiatives. Collectively we are actively working towards solutions for ocean challenges; our research delivers:

- Understanding of socioecological systems and the interactions that characterise them
- Research integration, synthesizing understanding of socioecological challenges and how to effectively meld perspectives from multiple disciplines, working with a range of stakeholders to co-produce knowledge
- Technical expertise and tools around qualitative and quantitative approaches to inform management of multiple uses in our coastal and marine domains

One of our largest projects is the Future Seas initiative (futureseas2030.org) which develops evidence-informed scenarios of the future by 2030, for each of 12 key challenges, and generates tangible plans for effective actions at local, regional and global scales. These actions are designed to realise a vision for 2030 which is in line with achieving an equitable and sustainable future (as outlined by the United Nations Sustainable Development Goals). Approximately 40% of the Future Seas group are PhD students and Early Career Researchers, and the initiative has been deliberated crafted to provide an excellent opportunity to train and mentor the next generation of interdisciplinary researchers with the skills, experience and expertise necessary to help address some of the complex interdisciplinary challenges faced by society today. Future Seas involves 130 researchers from 27 different organisations; importantly, the initiative includes an Indigenous and Traditional Working Group formed of scholars and elders from around the world.

Our contribution to the GEOS proposal

A key reason that CMS and Future Seas have been successful is because of our strong focus on inclusivity, diversity, inclusion of multiple knowledge systems, and our capacity building for, and interdisciplinary training of, future generations of marine researchers. Forging partnerships outside of academia, and co-design of projects is another strength (see Blythe and Cvitanovic 2020 research evaluation of our center for more details "Five Organizational Features That Enable Successful Interdisciplinary Marine Research" in Frontiers in Marine Science, https://doi.org/10.3389/fmars.2020.539111).

Effective networking and co-design has underpinned much of our success, in terms of both CMS and the Future Seas project specifically. As co-hosts of GEOS, our contribution will be to apply this expertise and our uniquely interdisciplinary capacity to supporting the 'Convene' and 'Co-design' pillars of GEOS.

We believe one of the strengths of the GEOS proposal is the balance across hemispheres in terms of two strong co-hosts – one from the Northern Hemisphere and one from the Southern Hemisphere. We look forward to working with the other participants and partners in the GEOS programme to deliver this innovative programme across research, private, and public sector actors to co-create a set of UN Decade Projects that advance system-level ocean solutions.

Sincerely,

Professor Gretta Pecl
Director, Centre for Marine Socioecology &
Professor, Institute for Marine and Antarctic Studies
Email: Gretta.Pecl@utas.edu.au
Mob: +61 408 626 792

ECOP
Early Career
Ocean Professionals

January 6, 2021

Dear IOC Secretariat,

This letter is to confirm our strong commitment to the Decade Programme Proposal: **A Global Ecosystem for Ocean Solutions (GEOS)**.

This proposal has been built through the engagement with a wide range of participants from diverse backgrounds and is exactly the kind of interdisciplinary and solutions-focused Programme that we endeavor to participate in the design and delivery of the United Nations Decade of Ocean Science for Sustainable Development. Today's challenges in the oceans will only be addressed through innovative, interdisciplinary and co-created programs that ensure diversity of representation and include appropriate consideration of the human elements.

The Early Career Ocean Professional (ECOP) programme has been developed to ensure that diverse engagement, especially as related to career stage and intergenerational diversity, is central to the Ocean Decade and the associated Actions, processes, and frameworks. The mission of ECOPs is to contribute new ways of thinking to global challenges related to ocean sustainability and stewardship by providing ECOPs with meaningful opportunities to engage with each other and with local to global institutions through the framework of the UN Decade of Ocean Science for Sustainable Development. Therefore, we look forward to bringing information on ECOP scientific priorities, perspectives, and needs to the GEOS programme and to ensure connectivity and knowledge exchange between Decade Actions.

We look forward to working with the other participants and partners in the GEOS Programme to deliver this innovative program across research, private, and public sector actors to co-create a set of UN Decade Actions that advance system-level ocean solutions.

Sincerely,

Erin Satterthwaite
ECOP Informal Working Group member
Program Coordinator
California Sea Grant
Scripps Institution of Oceanography, UCSD, USA
Email: esatterthwaite@ucsd.edu

January 13, 2021

Dear Intergovernmental Oceanographic Commission Secretariat,

This letter is to confirm our strong commitment to the Decade Programme Proposal: **A Global Ecosystem for Ocean Solutions (GEOS)**.

This proposal has been built through the engagement with a wide range of participants from diverse backgrounds and is exactly the kind of interdisciplinary and solutions-focused Programme that we endeavor to design and deliver to the United Nation Decade for Ocean Science for Sustainable Development. Today's challenges in the oceans will only be addressed through innovative, interdisciplinary and co-created programs that ensure diversity of representation and include appropriate consideration of the human elements.

AGU is the pre-eminent scientific society in the Earth and space sciences, representing more than 130,000 scientists in more than 138 countries, and it is the world's largest home for research dedicated to geoscience, its impacts, and solutions. Our members work in academia, industry, the non-profit sector, and government – with many representing the ocean sciences sector. AGU programs include serving as a scholarly publisher, convening virtual and in-person events, and providing career support at all levels. AGU has been involved in the planning process for the Decade over the last few years and remains committed to supporting and partnering in implementing its vision.

AGU looks forward to working with the other participants and partners in the GEOS Programme to deliver this innovative program across research, private, and public sector actors to co-create a set of UN Decade Projects that advance system-level ocean solutions.

Janice Lachance

Janice Lachance
AGU
Executive Vice President, Strategic Leadership & Global Outreach

January 9, 2021

Dear IOC Secretariat,

This letter is to confirm our strong commitment to the Decade Programme Proposal: **A Global Ecosystem for Ocean Solutions (GEOS)**.

This proposal has been built through the engagement with a wide range of participants from diverse backgrounds and is exactly the kind of interdisciplinary and solutions-focused Programme that we endeavor to participate in the design and delivery of the United Nation Decade for Ocean Sustainable Development. Today's challenges in the oceans will only be addressed through innovative, interdisciplinary and co-created programs that ensure diversity of representation and include appropriate consideration of the human elements.

About 1000 Ocean Startups

1000 Ocean startups is a coalition to accelerate Ocean Impact Innovation. The coalition brings together the ecosystem of incubators, accelerators, competitions, matching platforms and VCs supporting startups for ocean impact. Its objective is to scale 1000 transformative startups during the Ocean Decade. The coalition achieves its objective through (i) building synergies between ecosystem participants and (ii) telling the story of successes already achieved and the potential of innovation to regenerate Ocean health, to inspire investment in scaling now the ocean impact innovation ecosystem.

1000 Ocean Startups has been recognized by the Ocean Panel as an Action Group leading the implementation of its agenda for a Sustainable Blue Economy.

The members of 1000 Ocean Startups include: AiiM, Blue Oceans Partners, Conservation International Ventures, GEOS / Ocean Visions, Hatch, Investable Oceans, Katapult Ocean, Ocean Exchange, Ocean Hub Africa, Ocean Impact Organisation, S2G, Schmidt Marine Technology Partners , SeaAhead, TOOL, Uplink, Walton Personal Philanthropy Group.

We look forward to working with the other participants and partners in the GEOS Programme to deliver this innovative program across research, private, and public sector actors to co-create a set of UN Decade Projects that advance system-level ocean solutions.

Christian Lim
1000 Ocean Startups
Steering Committee member

Alexis Grosskopf
1000 Ocean Startups
Steering Committee member

TMA BlueTech
4420 Hotel Circle Court, Suite 215
San Diego, CA 92108
+1 619 450-4600
www.tmablutech.org

January 11, 2021

Dear IOC Secretariat,

I write on behalf of **TMA BlueTech** (**TMA**) and the **BlueTech Cluster Alliance (BTCA**) in support of this Decade Programme Proposal: **A Global Ecosystem for Ocean Solutions (GEOS)**.

This proposal has been developed through the engagement with a wide range of participants from diverse backgrounds and is the kind of interdisciplinary and solutions-focused Programme that we believe will be a valuable participant in the design and delivery of the **UN Decade of Ocean Science for Sustainable Development** (2021-2030). Today's challenges in the oceans will only be addressed through innovative, interdisciplinary and co-created programs that ensure diversity of representation and include appropriate consideration of the human elements.

TMA BlueTech (TMA) is the non-profit industry association and cluster organizer for ocean and water industries based in San Diego, CA. Its Mission Statement is "*Promoting Sustainable, Science-Based Ocean & Water Industries*." **TMA** represents the largest BlueTech cluster in the U.S. (and one of the largest in the world) with approximately 100 members and a database of over 22,000 individuals. We bring education, industry and policy resources (the "Triple Helix") together to promote innovation and economic development in the Blue Economy. We create a strong "Blue Voice" via unique events, information sharing, national and international outreach, networking, research, and workforce development.

TMA is a co-Founding Member of the **BTCA**, which is the only global network of ocean technology clusters. **BTCA** brings together 10 leading BlueTech clusters from 8 countries (CA, FR, IR, NO, PT, SP, UK, US) that represent thousands of companies and organizations.

We look forward to working with the other participants and partners in the GEOS Programme to deliver this innovative program across research, private, and public sector actors to co-create a set of UN Decade Projects that advance system-level ocean solutions.

Sincerely,

Michael B. Jones – President
MBJones@TMABlueTech.org

ocean-climate.org

Ocean & Climate Platform
195 rue Saint-Jacques,
75005, Paris

8 January 2021

Dear IOC Secretariat,

This letter is to confirm our strong commitment to the Decade Programme Proposal: **A Global Ecosystem for Ocean Solutions (GEOS)**.

This proposal has been built through the engagement with a wide range of participants from diverse backgrounds and is exactly the kind of interdisciplinary and solutions-focused Programme that we endeavor to participate in the design and delivery of the United Nation Decade for Ocean Sustainable Development. Today's challenges in the oceans will only be addressed through innovative, interdisciplinary and co-created programs that ensure diversity of representation and include appropriate consideration of the human elements.

The GEOS Programme is perfectly in line with the value of the Ocean & Climate Platform, which is to rely on scientific and multidisciplinary expertise, as well as to draw on the knowledge of various actors to co-construct a global and complex approach to marine and coastal ecosystems threatened by climate change, which is essential for designing effective and sustainable solutions.
The Ocean & Climate Platform will support the GEOS Programme, notably through the submitted Sea'ties Programme which focuses on sharing solutions to rising sea-levels in five different regions of the world, with the support of an international network of scientists and the participation of various stakeholders.

We look forward to working with the other participants and partners in the GEOS Programme to deliver this innovative programme across research, private, and public sector actors to co-create a set of UN Decade Projects that advance system-level ocean solutions.

PLATEFORME
OCEAN ET CLIMAT
195, rue Saint-Jacques
75005 Paris
Siret: 83106350800012

Théophile Bongarts,
Sea'ties Project Manager,
Ocean & Climate Platform

राष्ट्रीय ध्रुवीय एवं समुद्री अनुसंधान केन्द्र
पृथ्वी प्रणाली विज्ञान संगठन
पृथ्वी विज्ञान मंत्रालय (भारत सरकार)
हेडलैण्ड सडा, वास्को-डा-गामा, गोवा-४०३ ८०४, भारत

NATIONAL CENTRE FOR POLAR AND OCEAN RESEARCH
Earth System Science Organisation
Ministry of Earth Sciences, (Government of India)
Headland Sada, Vasco-da-Gama, Goa - 403 804, INDIA

डॉ. एम. रविचन्द्रन
निदेशक

Dr. M. Ravichandran
Director

January 9, 2021

Dear IOC Secretariat,

This letter is to confirm our firm commitment to the Decade Programme Proposal: **A Global Ecosystem for Ocean Solutions (GEOS)**.

This proposal has been built through the engagement with a wide range of participants from diverse backgrounds. It is exactly the kind of interdisciplinary and solutions-focused Programme that we endeavor to participate in the design and delivery of the United Nations Decade for Ocean Sustainable Development. Today's challenges in the oceans will only be addressed through innovative, interdisciplinary, and co-created programs that ensure diversity of representation and include appropriate consideration of the human elements.

National Centre for Polar and Ocean Research (NCPOR), an autonomous body under the Ministry of Earth Sciences (MoES), Government of India has been actively involved in Ocean Observation and modelling in the Indian Ocean sector of the Southern Ocean and exploring ocean non-living resources in the Indian Ocean for the benefit of society. NCPOR has been a major stakeholder in numerous international efforts to strengthen our understanding of the Indian Ocean and the Southern Ocean and continue to pursue new collaborative opportunities as part of the UN Ocean Decade framework.

We look forward to working with the other participants and partners in the GEOS Programme to deliver this innovative program across research, private, and public sector actors to co-create a set of UN Decade Projects that advance system-level ocean solutions.

M. Ravichandran 9/1/21
(M. Ravichandran)

Dr. M. Ravichandran
Director
Earth System Science Organisation
National Centre for Polar & Ocean Research
Ministry of Earth Sciences, Govt. Of India
Headland Sada, Vasco-Da-Gama, Goa-403804

दूरभाष / Telephone: +91-832-2520876 | फैक्स / Fax: +91-832-2520877
ई-मेल / e-mail : mravi@ncaor.gov.in | वेब / Web: www.ncaor.gov.in

ESSO
INCOIS
ईएसएसओ - भारतीय राष्ट्रीय महासागर सूचना सेवा केन्द्र
पृथ्वी विज्ञान मंत्रालय, भारत सरकार
"ओशियन वैली", प्रगति नगर (बी.ओ.) निजामपेट (एस.ओ.), हैदराबाद - 500 090, तेलंगाना, भारत.
ESSO - INDIAN NATIONAL CENTRE FOR OCEAN INFORMATION SERVICES
(Ministry of Earth Sciences, Govt. of India)
"Ocean Valley", Pragathi Nagar (B.O.), Nizampet (S.O.), Hyderabad - 500 090, Telangana, India.
150 YEARS OF CELEBRATING THE MAHATMA

डॉ टी.श्रीनिवास कुमार / **Dr. T. Srinivasa Kumar**
निदेशक / **Director**

Ref:INCOIS:DIR:08:2021 **January 9, 2021**

Dear IOC Secretariat,

This letter is to confirm our strong commitment to the Decade Programme Proposal: **A Global Ecosystem for Ocean Solutions (GEOS)**.

This proposal has been built through the engagement with a wide range of participants from diverse backgrounds and is exactly the kind of interdisciplinary and solutions-focused Programme that we endeavor to participate in the design and delivery of the United Nation Decade for Ocean Sustainable Development. Today's challenges in the oceans will only be addressed through innovative, interdisciplinary and co-created programs that ensure diversity of representation and include appropriate consideration of the human elements.

INCOIS, an autonomous body under the Ministry of Earth Sciences (MoES), Government of India has been providing ocean information and advisory services to the country for nearly two decades now, through sustained ocean observations, numerical modelling and improvements through focussed research. Important societal services of INCOIS include information on Potential Fishing Zones, Ocean State Forecasts and Warnings related to tsunamis, storm surges, high wave alerts, oil spill trajectories, Harmful Algal Blooms, and other ocean-related phenomena. INCOIS has been a major stakeholder in numerous international efforts aimed at strengthening our understanding of the Indian Ocean, and will continue to pursue new collaborative opportunities as part of the UN Ocean Decade framework.

We look forward to working with the other participants and partners in the GEOS Programme to deliver this innovative program across research, private, and public sector actors to co-create a set of UN Decade Projects that advance system-level ocean solutions.

With best regards,

Yours sincerely,

(T Srinivasa Kumar)

Intergovernmental Oceanographic Commission of UNESCO
7 Place de Fontenoy
75352 Paris Cedex 07 SP

दूरभाष / Tel: +91 - 40 - 23895000 / 23886001 फैक्स / Fax: +91 - 40 - 23895001 ई-मेल / Email: director@incois.gov.in

8 January 2020

Intergovernmental Oceanographic Commission (IOC) of UNESCO
7 Place de Fontenoy
75352 Paris Cedex 07 SP
France
transmitted via email to the programme lead proponent

University of Victoria
Queenswood Campus
#100–2474 Arbutus Road
Victoria, BC V8N 1V8
Canada

T +1.250.472.5400
F +1.250.472.5370
info@oceannetworks.ca

oceannetworks.ca
@ocean networks

Dear IOC Secretariat,

I write to confirm our strong support of and commitment to the proposed Global Ecosystem for Ocean Solutions as a major contribution to the UN Decade for Ocean Science for Sustainable Development.

As a world leader in ocean observing technology and data, Ocean Networks Canada (ONC) empowers people with knowledge about our rapidly changing ocean. Monitoring the west and east coasts of Canada and the Arctic, our real-time, continuous, open data supports scientific discovery and informed decision making. We bring ocean data to the surface, providing ocean intelligence to coastal communities, researchers, policy makers, industry, and governments. And the ocean intelligence that ONC delivers includes coastal climate change adaptation and ocean-based climate change mitigation solutions. We also focus on empowering Indigenous coastal communities with ocean technology so that they can make their own informed decisions about their changing ocean front yards.

We are keen to make major contributions to this new programme that has been built through extensive outreach and engagement across disciplines, institutions, and solution seekers from around the world. Today's climate change emergency can only be solved with programmes like this, which will co-design and co-deploy equitable, durable, and scalable ocean-based solutions.

All of us at ONC look forward to joining and working with the partners of the Global Ecosystem for Ocean Solutions. The advancement of ocean-based solutions are critical to keeping the planet habitable for human survival for generations to come.

Sincerely,

Kate Moran, PhD, PEng, FCSSE
President & CEO

January 10, 2021

Dear IOC Secretariat,

This letter is to confirm our strong commitment to the Decade Programme Proposal: **A Global Ecosystem for Ocean Solutions (GEOS)**.

This proposal has been built through the engagement with a wide range of participants from diverse backgrounds and is exactly the kind of interdisciplinary and solutions-focused Programme that we endeavor to participate in the design and delivery of the United Nation Decade for Ocean Sustainable Development. Today's challenges in the oceans will only be addressed through innovative, interdisciplinary and co-created programs that ensure diversity of representation and include appropriate consideration of the human elements.

Ocean Exchange is a US 501.c.3 with the sole mission to help advance the global adoption of innovative solutions regarding sustainability, with a focus on healthy and resilient oceans and coastlines. We execute our mission by the award of funds to start-ups and with the creation of an ecosystem to assist the start-ups with the execution of critical steps to deployment and commercialization. Our funds are primarily privately sourced but we perform our activities with collaborative public and private organizations around the globe.

We look forward to working with the other participants and partners in the GEOS Programme to deliver this innovative program across research, private, and public sector actors to co-create a set of UN Decade Projects that advance system-level ocean solutions.

Milly Pitts

Millicent Pitts
CEO and Executive Director
Ocean Exchange
www.oceanexchange.org

OCEANHUB AFRICA

African ocean-impact catalyst

January 8, 2021

Dear IOC Secretariat,

This letter is to confirm our strong commitment to the Decade Programme Proposal: **A Global Ecosystem for Ocean Solutions (GEOS)**.

This proposal has been built through the engagement with a wide range of participants from diverse backgrounds and is exactly the kind of interdisciplinary and solutions-focused Programme that we endeavor to participate in the design and delivery of the United Nation Decade for Ocean Sustainable Development. Today's challenges in the oceans will only be addressed through innovative, interdisciplinary and co-created programs that ensure diversity of representation and include appropriate consideration of the human elements.

Who we are

OceanHub Africa (OHA) is a non-profit ocean-impact catalyst initiative, supporting ocean-impact ventures through acceleration programs (www.oceanhub.africa) and leading an international ocean-minded ecosystem (www.ocean-innovation.africa and co-leader of the 1000 Ocean Startups coalition in response to the High Level Panel for a Sustainable Ocean Economy www.oceanpanel.org – which OHA is part of as Advisor). Its mission is to inspire and assist innovative impact startups and nurture an environmentally conscious and profitable economy that would effectively mitigate the oceans' overexploitation, pollution as well as the effects of global warming on the oceans. We are based in Cape Town, at virtually the crossroads of three oceans and home to a strong scientific (international standard marine sciences), technical (one of the largest tech hubs in Africa) and business skills (some of the best universities on the continent) ecosystem.

The first acceleration programme was successfully completed last year in spite of the circumstances and saw 6 startups of different stages (prototyping to growth stage), technologies (digital to hardware) and industries (aquaculture/fisheries, shipping/ship-building, marine renewables/biotechnologies, coastal tourism/ocean-sports, awareness/education) graduating during the Ocean Innovation Africa Summit in Nov 2020.

OHA is supported by a number of partners including WWF, Mission Blue, Dassault Systèmes, Amazon, Sigfox, French and African Diplomacy, Universities etc. These organisations all come together because

African ocean-impact catalyst

they believe in the great - and untapped - potential of Africa's blue economy but we also see the threats of irresponsible ocean economic growth. Therefore, they strive to increase the development and adoption of new sustainable technologies and policies to place the continent at the forefront of a decidedly more sustainable ocean economy.
The founding team is comprised of two young professionals: an environmental engineer who graduated from Imperial College in 2010 after studying mechanical engineering, applied mathematics and business management in France and the UK. Former researcher on Hydrogen, sustainable development technical consultant and later head of R&D for a blue-chip construction company in Europe, Alexis subsequently headed a social impact incubator in Africa before creating OceanHub Africa. His co-founder, Stéphanie, is a corporate finance and business management graduate from Imperial College as well (2013), former management consultant at AT Kearney in France and subsequently VC fund strategist in Africa before joining Alexis in launching OceanHub Africa.

As part of the GEOS programme, OceanHub Africa will act as facilitator connecting local research centres and universities to the GEOS Network to further expand the reach and inputs of the program whilst providing insights from and new testing grounds in Africa to the Innovation Engine, in collaboration and as part of the 1000 Ocean Startups coalition.

We look forward to working with the other participants and partners in the GEOS Programme to deliver this innovative program across research, private, and public sector actors to co-create a set of UN Decade Projects that advance system-level ocean solutions.

Yours in Ocean,

Alexis Grosskopf
CEO & co-founder | OceanHub Africa
email: alexis@oceanhub.africa
mobile: +27 84 513 1612
40 Dock Road, V&A Waterfront, 8002 Cape Town
SOUTH AFRICA

The President

11 January 2021

Prof. Emanuele Di Lorenzo
Program in Ocean Science & Engineering
Georgia Institute of Technology
311 Ferst Drive, Atlanta, Georgia 30332
United States of America

Dear Professor Di Lorenzo,

I am delighted to confirm CMCC strong commitment to the Decade Programme Proposal: **A Global Ecosystem for Ocean Solutions (GEOS)**.

This proposal has been built through the engagement with a wide range of participants from diverse backgrounds and is exactly the kind of interdisciplinary and solutions-focused Programme that we endeavor to participate in the design and delivery of the United Nation Decade for Ocean Sustainable Development. Today's challenges in the oceans will only be addressed through innovative, interdisciplinary and co-created programs that ensure diversity of representation and include appropriate consideration of the human elements.

This proposal fits squarely within CMCC Mission to carry out studies and models of our climate system and its interactions with society and the environment, to ensure reliable, timely and rigorous knowledge in order to stimulate sustainable growth, protect the environment and develop, in the context of climate change, adaptation and mitigation policies based on scientific results.

The CMCC draws extensive research expertise from its Co-Founders: National Institute of Geophysics and Volcanology (INGV); University of Salento, University of Bologna; Italian Aerospace Research Centre (CIRA); University of Venice, University of Sassari, University of Tuscia, Polytechnic of Milan; Resources for the Future (RFF – Washington DC - USA). The CMCC research network - with offices in Lecce, Bologna, Capua, Milan, Sassari, Venice and Viterbo - is made up of public and private institutions that collaborate in the multidisciplinary issues related to the sciences of climate change.

We look forward to working with the other participants and partners in the GEOS Programme to deliver this innovative program across research, private, and public sector actors to co-create a set of UN Decade Projects that advance system-level ocean solutions.

Sincerely yours,

Prof. Antonio Navarra
President,
Fondazione Centro EuroMediterraneo sui Cambiamenti Climatici
Lecce, Italy

ALMA MATER STUDIORUM
UNIVERSITÀ DI BOLOGNA

Department of Physics and Astronomy - DIFA

Bologna, January 11, 2021

To: Prof. Emanuele Di Lorenzo
Ocean Visions
Program in Ocean Science & Engineering
Georgia Institute of Technology

Dear Prof. Di Lorenzo,

this is to confirm that the Oceanography Laboratory of the Department of Physics and Astronomy of the University of Bologna is fully committed to support the work of GEOS throughout the UN decade of Ocean Science.

Furthermore, in my position of Chair of **CoastPredict**, we will work in synergy to develop projects that integrate research innovations for the global coastal ocean done in **CoastPredict** into solution models developed by the GEOS networks. This is a key outcome of the UN Decade, science for solutions/services: two programmes are needed, **CoastPredict** and GEOS in order to mobilize enough human resources to produce a transformative capacity of the ocean solution to reach the sustainable development goals targets.

Looking forward to a productive collaboration between the two programmes,

Yours sincerely

Professor Nadia Pinardi

Alma Mater Studiorum University of Bologna

Chair of CoastPredict

Nadia Pinardi
Full Professor of Oceanography
Department of Physics and Astronomy
Alama Mater Studiorum, University of Bologna
Viale Berti Pichat 8 - 40127 Bologna- Italy
TEL. +39 051 2095023
E-mail nadia.pinardi@unibo.it
Web site: http://www.sincem.unibo.it/