

# Scientific and Technical Advisory Panel Report to the 55<sup>th</sup> Meeting of the GEF Council



Annamite striped rabbit  
(*Nesologus timminsi*)

# STAP Panel Members and Advisers

---



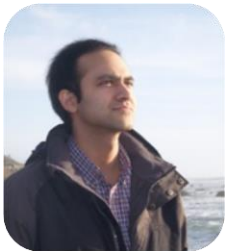
**Thomas Lovejoy**  
*Adviser to Chair*



**Rosina Bierbaum**  
*Chair*



**Mark Stafford Smith**  
*Adviser to Chair*



**Saleem Ali**  
*Climate Change  
Mitigation*



**Rosie Cooney**  
*Biodiversity*



**Jamidu Katima**  
*Chemicals & Waste*



**Graciela  
Metternicht**  
*Land Degradation*



**Blake Ratner**  
*International Waters*



**Ferenc Toth**  
*Climate Change  
Adaptation*



---

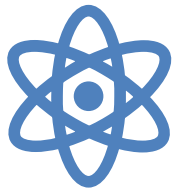
**New science**

---

**Update on papers**

---

**Looking towards the  
Impact Programs:  
recent and future work**



**NEW  
SCIENCE**

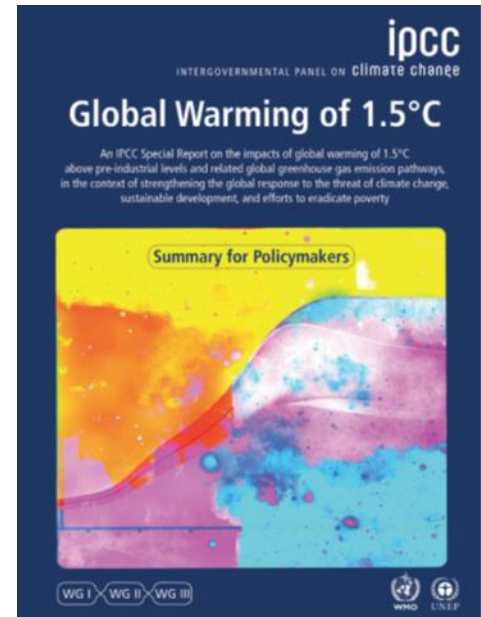


# IPCC Special Report on 1.5°C

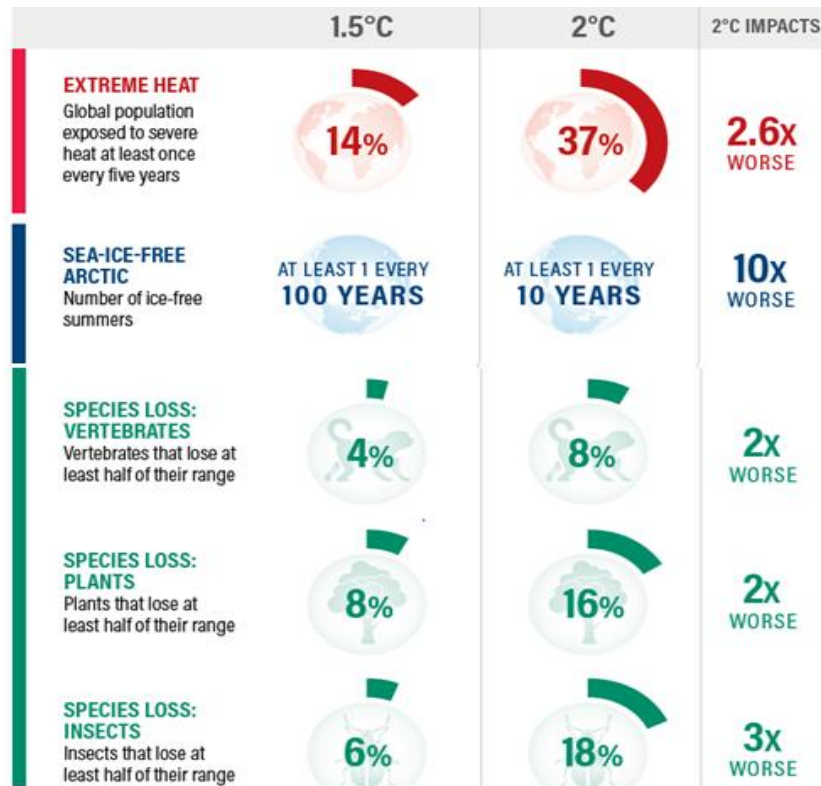
---

Three key messages:

- global warming is likely to reach 1.5 °C between 2030 and 2052 if it continues to increase at the current rate (*high confidence*)
- climate-related risks for natural and human systems are higher for global warming of 1.5 °C than at present, but lower than at 2 °C (*high confidence*)
- most adaptation needs will be lower for global warming of 1.5 °C compared to 2 °C (*high confidence*).



# Difference between 1.5°C and 2°C



Source: Half a Degree of Warming Makes a Big Difference. World Resources Institute, 2018









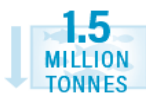
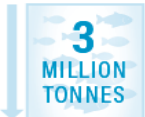


A. Doncila



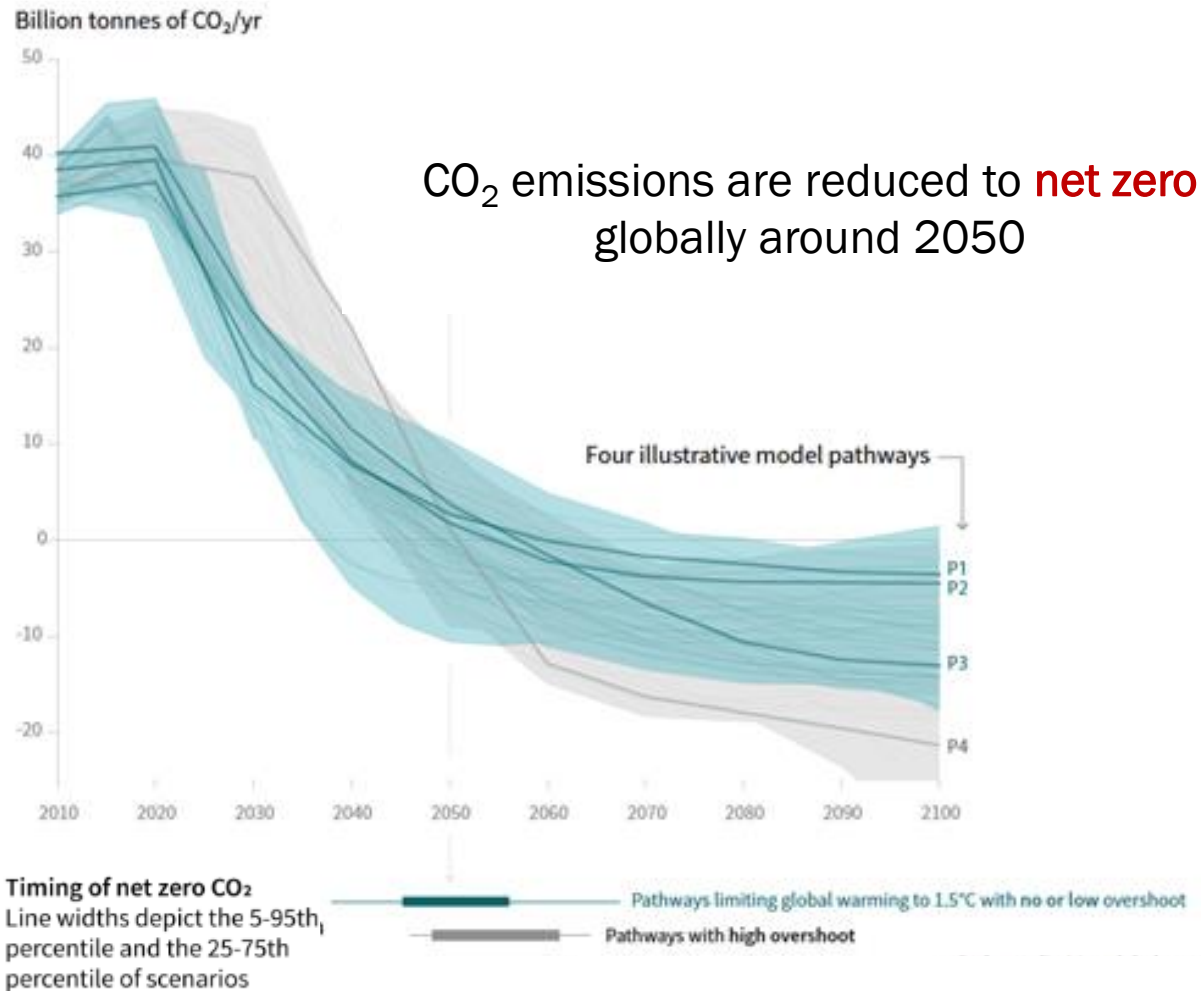
A. Sorokin

# Difference between 1.5°C and 2°C

	1.5°C	2°C	2°C IMPACTS
<b>ECOSYSTEMS</b> Amount of Earth's land area where ecosystems will shift to a new biome	 7%	 13%	<b>1.86x</b> WORSE
<b>PERMAFROST</b> Amount of Arctic permafrost that will thaw	 4.8 MILLION KM <sup>2</sup>	 6.6 MILLION KM <sup>2</sup>	<b>38%</b> WORSE
<b>CROP YIELDS</b> Reduction in maize harvests in tropics	 3%	 7%	<b>2.3x</b> WORSE
<b>CORAL REEFS</b> Further decline in coral reefs	 70- 90%	 99%	UP TO <b>29%</b> WORSE
<b>FISHERIES</b> Decline in marine fisheries	 1.5 MILLION TONNES	 3 MILLION TONNES	<b>2x</b> WORSE



Source: Half a Degree of Warming Makes a Big Difference. World Resources Institute, 2018



Source: Global Warming of 1.5°C. Summary for Policymakers. Figure SPM.3a | Global emissions pathway characteristics.



# Arctic Report Card 2018

Effects of persistent Arctic warming continue to mount

## 2018 Headlines

### Effects of persistent Arctic warming continue to mount

Continued warming of the Arctic atmosphere and ocean are driving broad change in the environmental system in predicted and, also, unexpected ways. New emerging threats are taking form and highlighting the level of uncertainty in the breadth of environmental change that is to come.

## Video



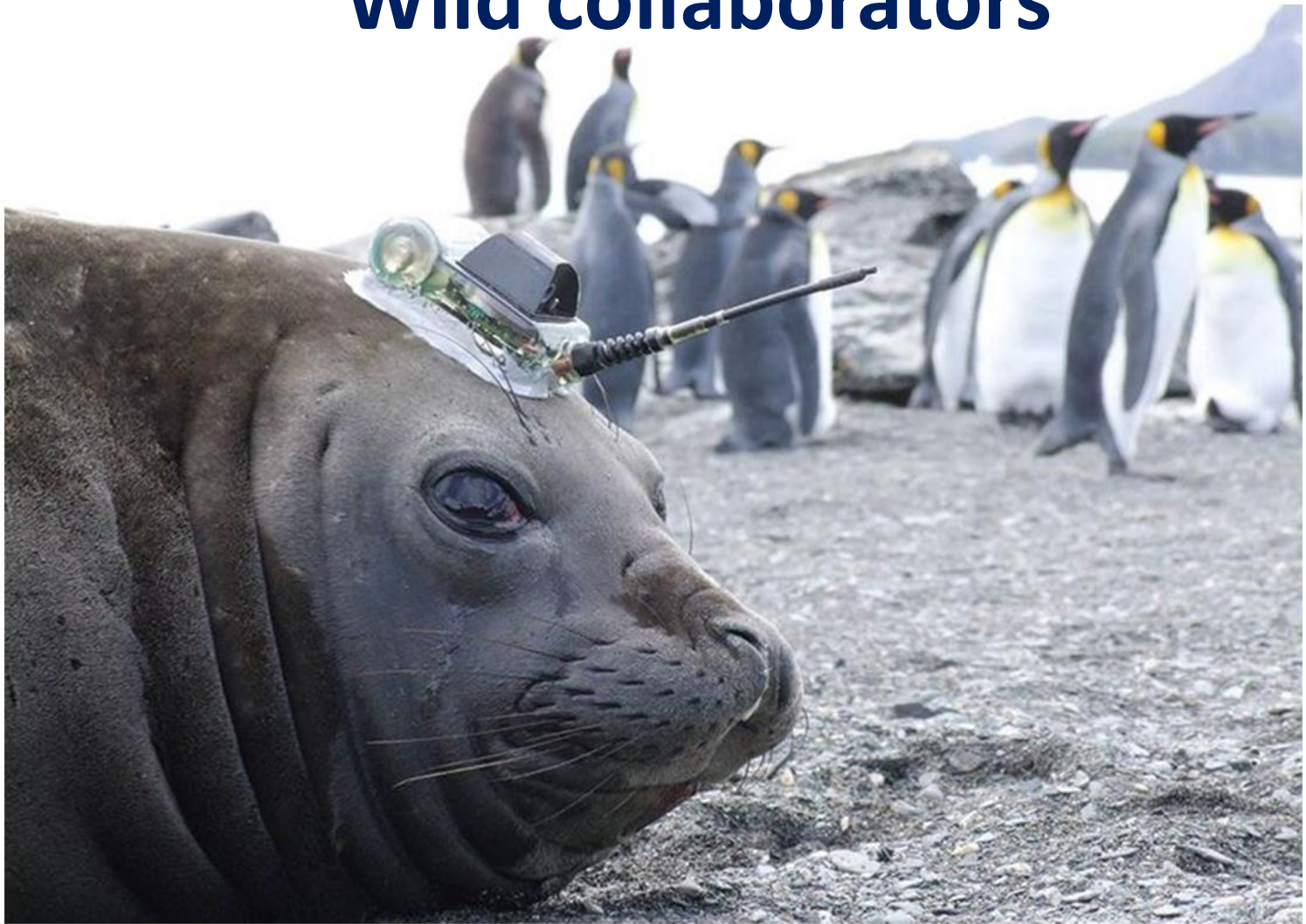
<https://arctic.noaa.gov/Report-Card/Report-Card-2018>

# Arctic Report Card 2018

## Effects of persistent Arctic warming continue to mount

- **Surface air temperatures** in the Arctic continued to warm at two times the rate of the rest of the globe.
- Long-term trends in declining terrestrial **snow cover**, melting of the **Greenland Ice Sheet** and **lake ice** continue.
- The last 12 years had the lowest extent of Arctic **sea ice**.
- Herd populations of **caribou and wild reindeer** across the Arctic tundra have declined about 50% over the last two decades, despite increase in vegetation.
- Warming Arctic Ocean conditions coincide with an expansion of **harmful toxic algal blooms** in the Arctic Ocean, threatening food sources.
- **Microplastic contamination** is on the rise in the Arctic, posing a threat to seabirds and marine life than can ingest debris.

# Wild collaborators



Credit: Lars Boehme (Sea Mammal Research Unit, University of St. Andrews, UK.)

# The Global Adaptation Commission

- Led by former U.N. Secretary-General Ban Ki-moon, Bill Gates, and World Bank Group CEO Kristalina Georgieva
- 17 convening countries
- 28 global commissioners (*Naoko Ishii*)
- a network of 23 research partners
- 20 senior advisors (*Rosina Bierbaum*)
- WRI & the Global Center on Adaptation serve as managing partners



GLOBAL  
COMMISSION ON  
ADAPTATION

#ACCELERATEADAPTATION

Countries at the forefront of adaptation have taken the lead in convening the Global Commission on Adaptation:

Argentina	Ethiopia	Mexico
Bangladesh	Germany	Netherlands
Canada	Grenada	Senegal
China	India	South Africa
Costa Rica	Indonesia	United Kingdom
Denmark	Marshall Islands	

GCA.org



Photo: Danish Wind Industry Association/Flickr

# THE FLAGSHIP REPORT 2019

The Commission's flagship report will set out:

---

- **WHY** adapting to climate risks and accelerated action is essential, as we have not yet grasped the scale of **transformation** required.
- **WHAT** new actions need to be taken and what must be done differently.
- **HOW** we can start working today to make the world a safer, better place.
- The process involves strong engagement with stakeholders and research partners

# Phase 1: STAP climate screening (2017)

---

- GEF Council asked STAP to examine the effects of climate change on GEF projects
- Future climate information either missing or cursory
- Impacts mentioned but rarely a plan for ameliorating them included
- Climate risk timeframe: project duration vs expected GEBs
- If climate risk assessments are done, tend to occur well after the development of project objectives



# Phase 2: Analysis of climate risks in GEF 6 projects (2018)



The World Bank and USAID climate risk screening tools were applied to 24 GEF-6 PIFs and CEO-endorsed projects to see what climate risks could be identified

- Examples of strong projects tackled climate risks:
  - Clearly stated climate change risks, and had clear objectives to address them
  - Identified ways to ameliorate impacts or changed design to lessen them
- Examples of weak projects did not provide sufficient future climate information and/or enable climate risks to be addressed properly

<http://stapgef.org/stap-meeting-june-2018-0>

# Phase 3: Analysis of Agency approaches to climate screening (2018)

---

All 18 GEF agencies were asked for information about the approaches to risk screening. This showed:

- 12 agencies are practicing some form of climate risk screening
  - 6 identified the risks; considered how the risks might affect the project's objectives; and recommended ameliorate action
  - 6 did some of these 3 steps, but not all.
- 6 remaining agencies provided insufficient information
- Need for a minimum standard?





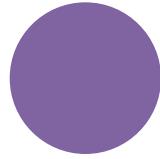
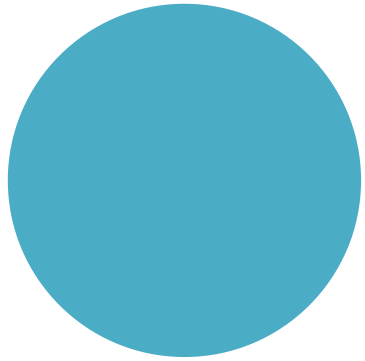
# STAP screening guidelines

---

For climate risk, and climate resilience measures:

- How will the project be affected by climate risks over the period 2020 to 2050, and have the impacts been addressed adequately?
- Has the sensitivity to climate change, and its impacts, been assessed?
- Have measures to address the risks been considered? How will these be dealt with?
- What technical and institutional capacity, and information is needed?





# **UPDATE ON PAPERS**



# Completed paper: Novel entities

Things created and introduced into the environment by human beings that could have positive or negative disruptive effects on the earth system and may include new substances or new forms of existing substances



- Technology-critical elements (TCEs)
- Blockchain technology
- Next generation nanotechnology
- Gene editing/CRISPR
- Engineered bio-based materials
- Cellular agriculture

# Novel Entities Update: Technology-Critical Elements

**Technology-critical elements (TCEs):** including rare earth elements and the platinum group elements are used in emerging and green technologies but chemical pollution, biodiversity loss, deforestation, and land degradation are concerns



The 'world's tech waste lake' in Baotou, China. This is perhaps the most disturbing example of the environmental cost of our smartphone thirst, Dr Patrick Byrne says. Created in 1958, this artificial lake collects the toxic sludge from rare earth processing operations

NEWS / BUSINESS & ECONOMY

## Malaysia tells Lynas to remove rare earths radioactive waste

*Decision follows an expert review of the east coast facility's operations. It has until September to remove the waste.*

4 Dec 2018 [f](#) [t](#)



FINANCIAL TIMES

The Big Read Mining [+ Add to myFT](#)

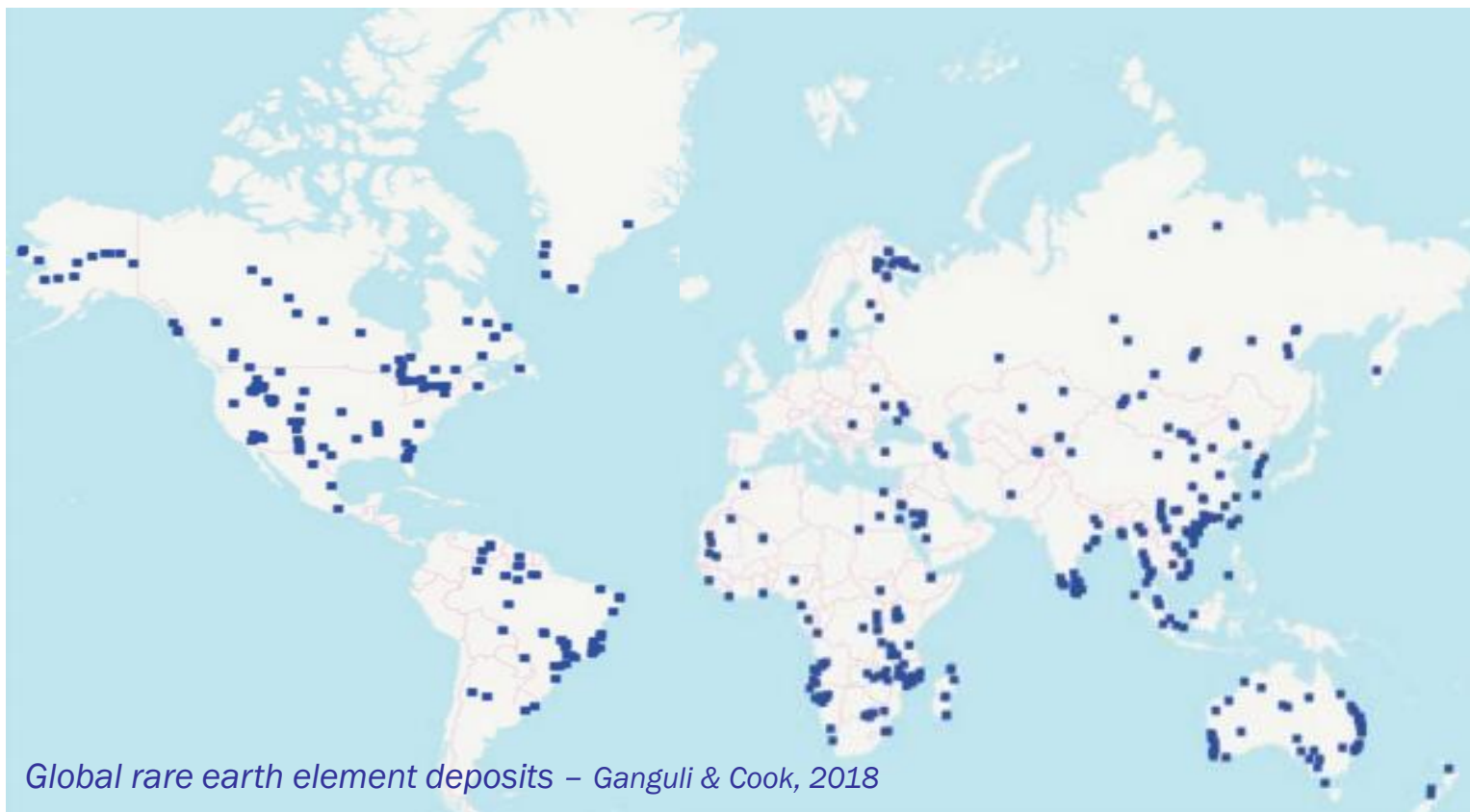
## Electric vehicles spur race to mine deep sea riches

Miners want to tap subsea cobalt deposits for green technologies, but environmentalists worry



# Novel Entities Update: Technology-Critical Elements

---



Mining of rare earth elements and other TCEs could shift to GEF-recipient countries

---

# Novel Entities Update: Blockchain Technology

---

**Blockchain technology:** several environmental applications including energy microgrids, digitalized climate MRV, tracking and sharing benefits of genetic resources

BLOCKCHAIN TECHNOLOGY

## Ixo Foundation Uses Blockchain Technology in Conservation Efforts in Madagascar



Published 3 months ago on September 27, 2018  
By Tashi Odingo



Ixo Foundation, a non-profit open-source software development organization, uses blockchain-based platform to monitor a tree-planting scheme at the Ranomafana National Park, Madagascar

It will provide pictures and GPS coordinates every time a seed or sapling is planted, then compares that with satellite imagery or light readings from ground sensors to confirm whether there's an increase of trees in the particular area.

People can donate and receive real-time updates as well as the pictures of the tree planting process.

Being planned for Impact Investing

# Novel Entities Update: Gene editing/CRISPR

**Gene editing/CRISPR** – editing of DNA of organisms: improve plant adaptation to climate change; saving endangered species or eradicating invasive species; but threat to biodiversity and ecosystems in the absence of adequate governance and regulation

The Washington Post | e-Replica

The Washington Post | Calendar | 27 Nov 2018

Previous Story

Article rank ■■■ | 27 Nov 2018 | The Washington Post | BY LAURAN NEERGAARD | – Associated Press

## From salad dressing to granola bars, gene-edited foods are coming soon

Zoom | Bookmark | Share | Print | Listen | Translate

- Gene-edited canola oil already in the market
- Ongoing work to boost the cacao plant's immune system to ravaging virus
- Gene-editing is being applied to a native variety of corn to produces more grain under drought conditions

### BIOLOGY

## Malaria-resistant mosquitoes engineered using CRISPR



Michael Irving | March 9th, 2018



# Novel Entities Update: Cellular Agriculture

**Cellular agriculture:** producing food from cell cultures – help reduce the environmental footprints of current food production systems; but regulation, ethical concerns, and public acceptance

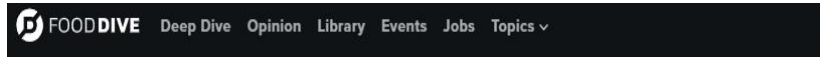
Lab-grown burger \$325,000 in 2013; \$11 in 2015

Cost projected to decrease to less than \$5 per pound of cultured meat by 2020

This 'Clean Meat' Company Plans to Get Lab-Grown Chicken on Your Plate by 2019



By: [Susan Bird](#) | July 3, 2018  
About Susan | Follow Susan at [@ItsSusanBird](#)



BRIEF

**Finless Foods wants its lab-grown tuna to hit the market in 2019**

**STAP** SCIENTIFIC AND TECHNICAL ADVISORY PANEL  
An independent group of scientists that advises the Global Environment Facility



# Completed: Innovation and the GEF

---

- Technological
- Innovative financing
- Business model
- Policy
- Institutional



[https://www.thegef.org/sites/default/files/council-meeting-documents/EN\\_GEF.STAP\\_.C.55.Inf\\_.03\\_STAP\\_Innovation.pdf](https://www.thegef.org/sites/default/files/council-meeting-documents/EN_GEF.STAP_.C.55.Inf_.03_STAP_Innovation.pdf)

# Innovation and the GEF

---

STAP suggestions for the GEF partnership:

- Define a risk appetite
- Decide who is responsible for innovation
- Cultivate innovative design
- Encourage adaptive implementation, and exchange lessons

# Local commons for global benefits

---

## What is the issue?

- Some global environmental problems require local solutions (e.g. biodiversity loss), particularly in forests and drylands.
- Many of these areas lack effective institutions for sub-national, inclusive governance.

## Why does it matter to the GEF?

- Forests and drylands are major centers of biodiversity, store vast amounts of carbon, and provide critical ecosystem services.
- The GEF recognizes the importance of these biomes and also the critical role of indigenous peoples and local communities.



# Local commons for global benefits

---

Considerations to improve likelihood of success for community-based natural resource management (CBNRM) projects:

- Encourage maximizing the financial and non-financial value of wild resources and ecosystem services
- Support inclusive community governance and build institutions from the bottom up
- Promote adaptive management and learning by building local capacity in the community
- Encourage secure tenure and community ownership



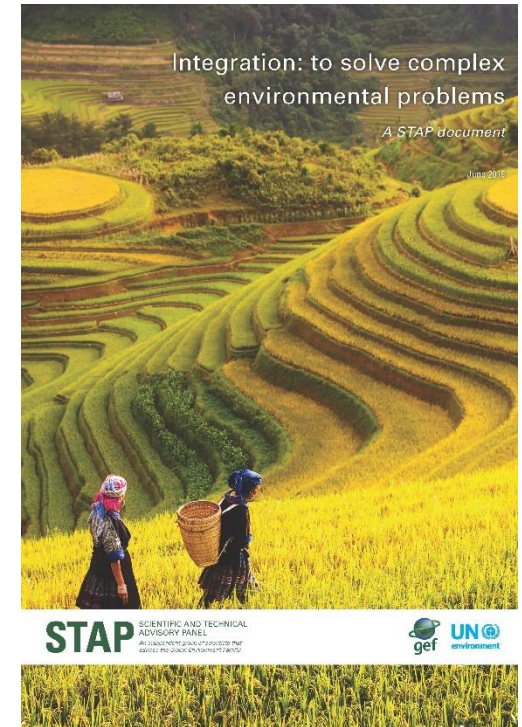


**LOOKING TOWARDS THE IMPACT  
PROGRAMS: RECENT AND FUTURE WORK**

# From MFAs to IAPs to IPs: Integration to solve complex environmental problems

---

- Systems thinking
- Theory of change
- Resilience planning
- Adaptive implementation pathways
- Knowledge management
- Exemplary stakeholder engagement
- Flexibility in project preparation



# Agency IAP lessons relevant to IPs

---

Robust program document assists countries design projects based on good integration practice

Coordination needs sufficient resources and allocation of responsibilities

High upfront transactions costs in inter-agency collaboration have medium term pay-offs

Genuine partnership takes longer to develop, requires trust building: facilitates integration and scaling

Close and continuing engagement with stakeholders is important for trust and facilitating dialogue

# STAP and the IPs

---

- STAP will review the IP program documents
- STAP stands ready to assist in developing Ips
- Panel member(s) will be assigned to each IP
- STAP is exploring how best to do this with lead agencies, and GEF Secretariat





# STAKEHOLDER ENGAGEMENT



## Proposed activities

- Earth Observation
- Land degradation neutrality
- Adaptation
- Multi-stakeholder dialogue
- Chemicals and waste
- Aquaculture

In addition to further work on climate risk screening.







**You're in charge  
of the last of the  
Truffula Seeds.  
And Truffula  
Trees are what  
everyone needs.  
Plant a new  
Truffula. Treat it  
with care.  
Give it clean  
water. And feed  
it fresh air.  
Grow a forest.  
Protect it from  
axes that hack.  
Then the Lorax  
and all his  
friends  
may come back."**



## **The Lorax**

*Dr. Seuss*

**THANK YOU**



**Scientific and Technical Advisory Panel  
Report to the 55<sup>th</sup> Meeting of the GEF Council**