



1:30pm – 3:00pm

International science and Canada — addressing global agenda 2030 together

Panel Organizer: Gordon McBean



Environment and
Climate Change Canada

Environnement et
Changement climatique Canada

Canada

Role of National Meteorological and Hydrological Services and the World Meteorological Organization in Addressing Agenda 2030

David Grimes

President, World Meteorological Organization

Assistant Deputy Minister, Meteorological Service of Canada, Environment and Climate Change Canada

Canadian Science Policy Conference

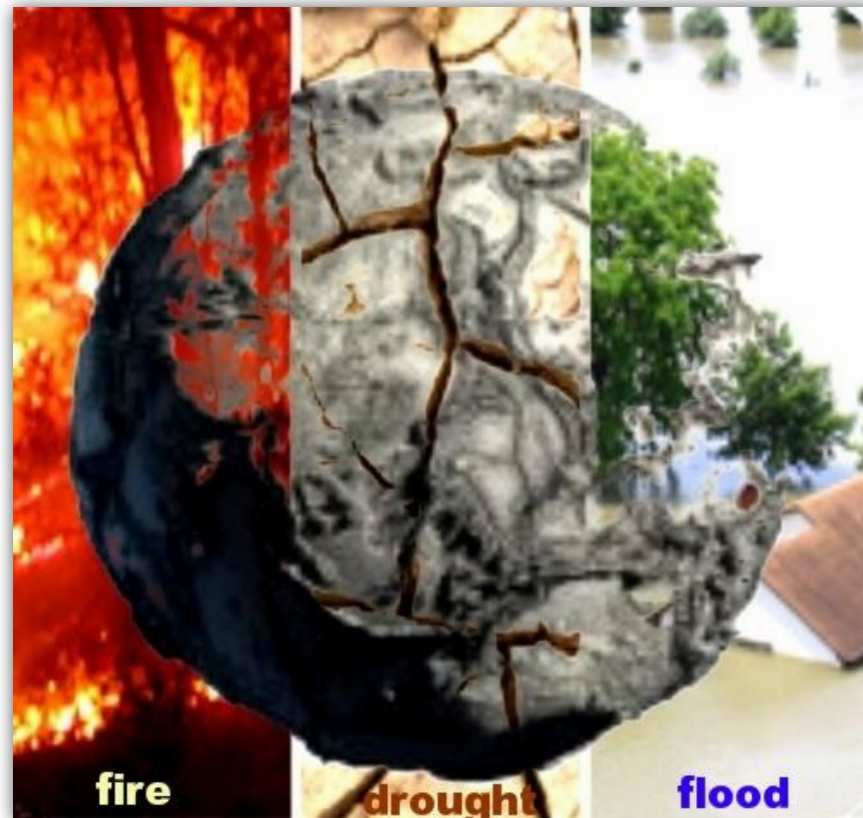
November 8, 2018



World Meteorological Organization

Weather • Climate • Water

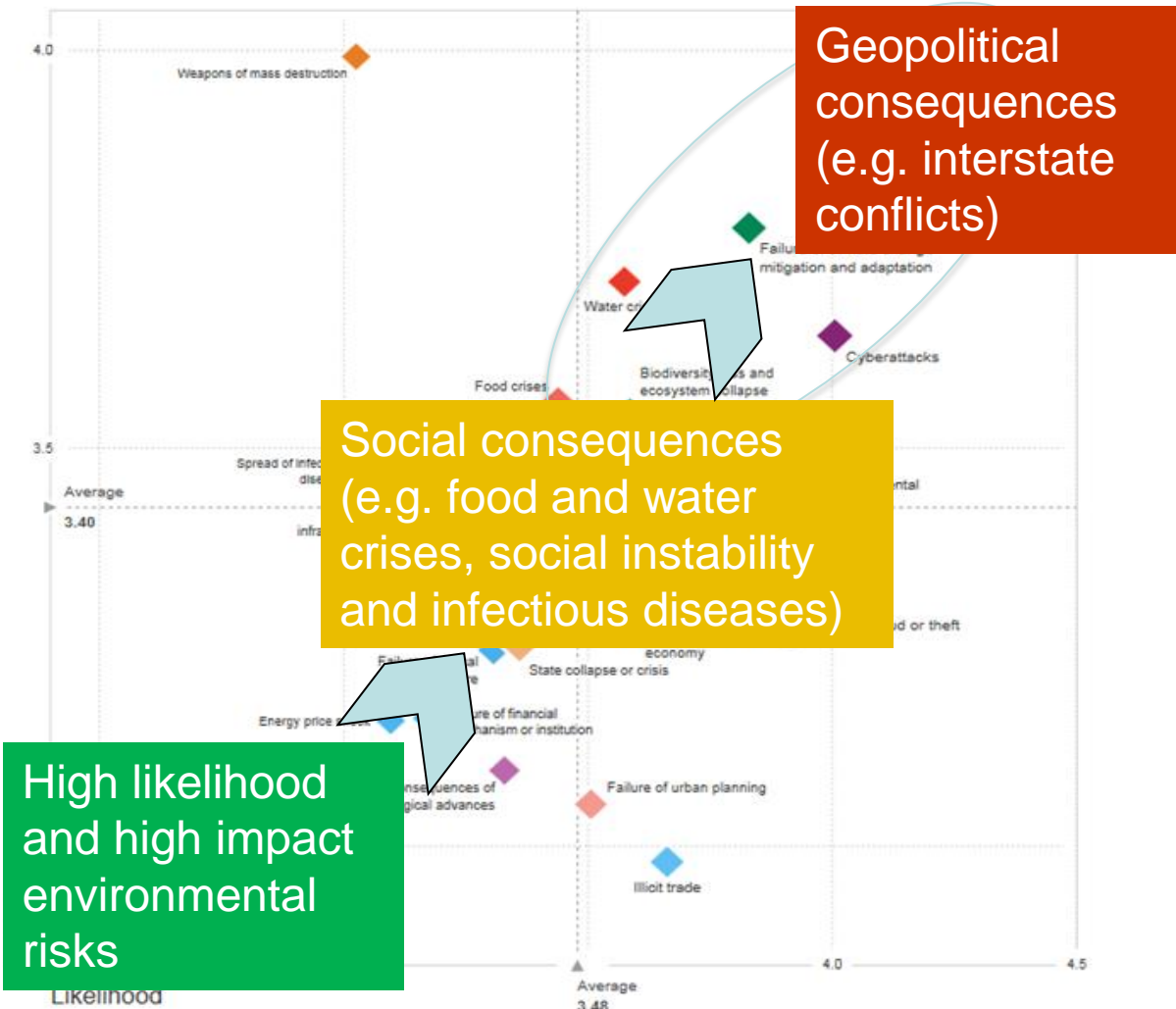
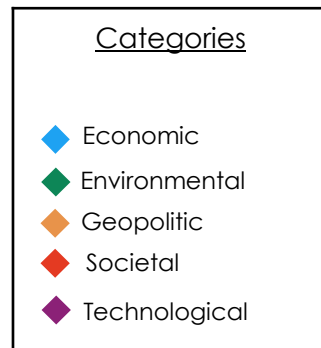
A Changing Planet



Weather is changing and so are the related global risks

Global risk landscape 2018

World Economic Forum



The Role of WMO and National Meteorological and Hydrological Services

The World Meteorological Organization is the UN Agency that convenes and coordinates efforts of its 191 member states on matters related to the Earth's atmosphere, weather, climate, and interactions with oceans and water resources

Together, the WMO and National Meteorological & Hydrological Services

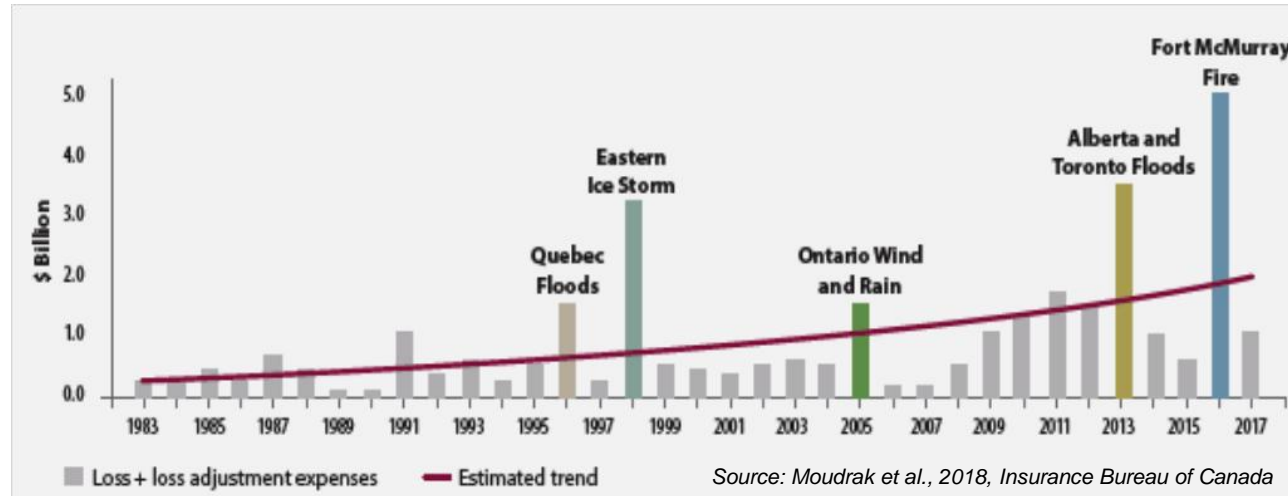
- Protect life and property
- Safeguard the environment and contribute to sustainable development
- Promote knowledge transfer, as well as standardization and interoperability for information exchange
- Cooperate internationally to provide sound science for decision making



Page 15 – November-26-18



Relevance of the Hydro-Meteorological Enterprise



Key Drivers

1. Global agenda creating unprecedented demand for actionable, accessible and authoritative science-based information
2. Increasing threats of extreme weather and climate urge action for resilience, mitigation and adaptation
3. Growing capacity gap threatens global infrastructure and services
4. Rapid advancements in science and technology and changing landscape of data and service delivery urge for innovative partnerships



WMO's Vision for 2030

WEATHER CLIMATE WATER
TEMPS CLIMAT EAU



WMO OMM

World Meteorological Organization
Organisation météorologique mondiale

By 2030, we see a world where all nations, especially the most vulnerable, are more resilient to the socioeconomic consequences of extreme weather, climate, water and other environmental events; and underpin their sustainable development through the best possible services, whether over land, at sea or in the air.



SUSTAINABLE DEVELOPMENT GOALS WMO



Weather resilience



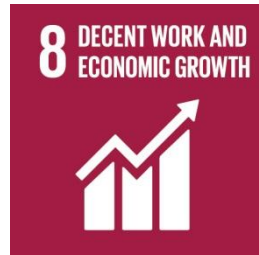
Climate change services



Water resource management



Solar, wind & hydro use



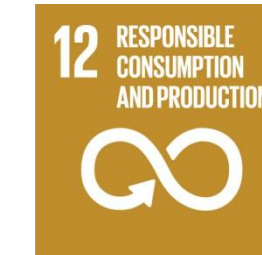
Climate resilience



Big data, innovations



Air quality, heat waves, flooding



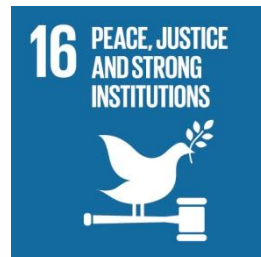
DRR, Adaptation, carbon & climate monitoring



Sea level rise, climate <-> oceans



Climate change <-> ecosystems



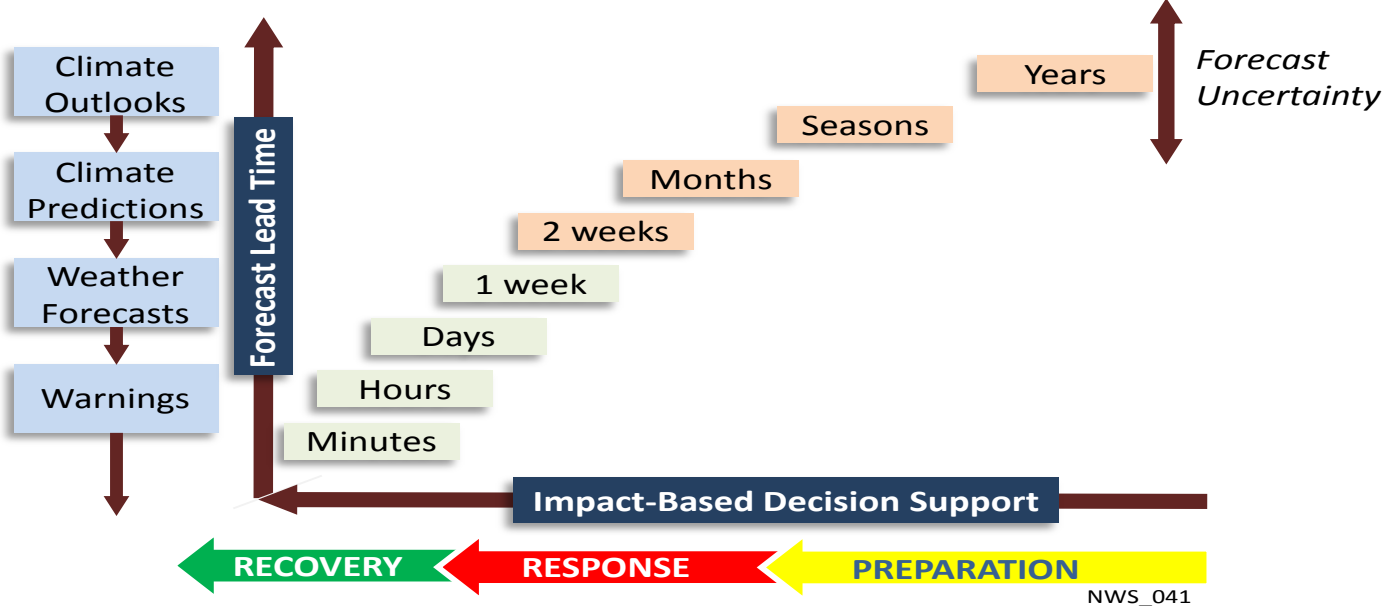
Climate driven conflicts



Resources for climate adaptation & DRR



Disaster Risk Reduction



- International network of multi-hazard early warning systems
- Frequency and intensity of events are monitored by NMHSs in order to provide impact-oriented warnings
- NMHSs prevent loss by providing data and analysis to increase the robustness of critical infrastructure/building codes



Paris Agreement

The Paris Agreement will drive international action to address climate change

- Critical need for climate information
- Reporting requirements for all countries
- Collective goal to limit global warming to 2°C, with efforts for 1.5°C

1. Quantify and monitor risks by generating and distributing information
2. Support adaptation through policy (i.e. GFCS) to enable nations and sub-nations through knowledge transfer

Long-term goals of WMO and the global hydro-meteorological enterprise...

Goal 1: Better Serve Societal Needs

- Early Warning Systems
- Broaden climate policy
- Water resource management
- Enhance socio-economic value of information

Goal 2: Enhance Earth Observations and Predictions

- Optimize data acquisition
- Improve and increase access and exchange of data
- Enable access and use of prediction products

Goal 3: Advance Targeted Research

- Enhance science-for-service value
- Advance policy-relevant science e.g. Environment-Health nexus

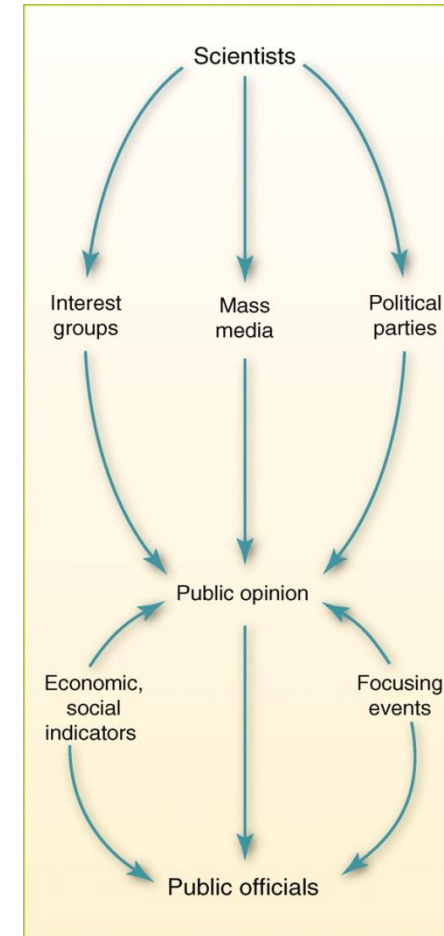
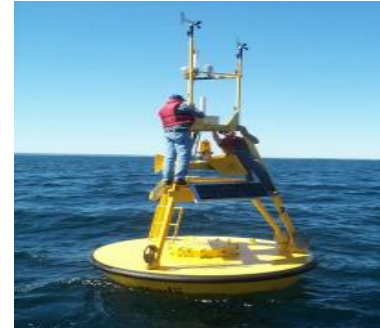
Goal 4: Close Capacity Gap

- Address needs of developing countries
- Develop and sustain core competencies and expertise
- Scale-up effective partnerships



Role of the International Science Community

- Knowledge of earth systems requires collaboration, coordination, open science and open data
- **Science** is the foundation and driver of **policy** outcomes which lead to **socioeconomic** outcomes



Source: Gormley Jr. W.T., From Science to Policy in Early Childhood Education. Science Vol 333 Issue 6045 August 2011



WEATHER CLIMATE WATER
TEMPS CLIMAT EAU



WMO OMM

World Meteorological Organization
Organisation météorologique mondiale

Thank you

SSHRC  CRSH  40
YEARS · ANS

ADVANCING KNOWLEDGE FOR CANADA'S FUTURE

ENABLING EXCELLENCE, BUILDING PARTNERSHIPS, CONNECTING RESEARCH TO CANADIANS

TED HEWITT, PRESIDENT

NOVEMBER 7, 2018

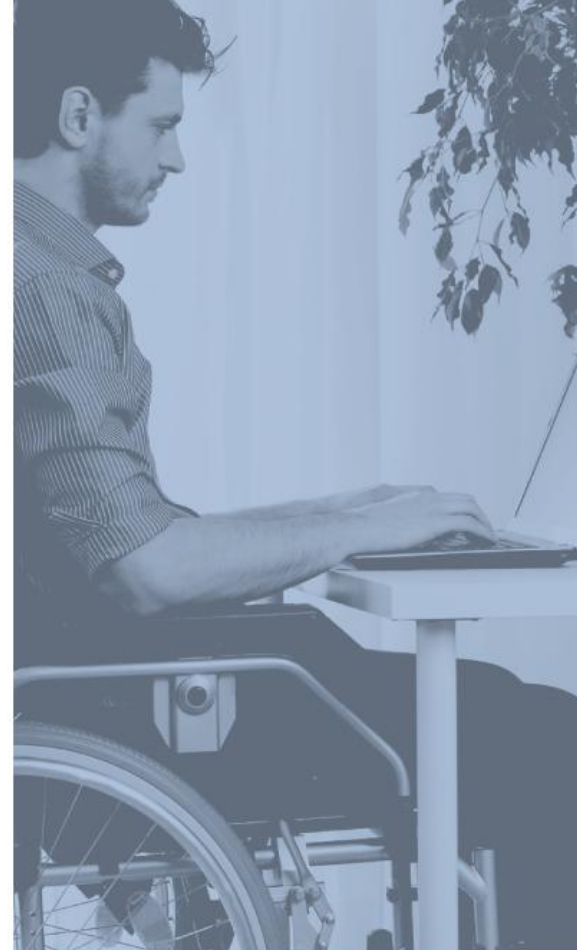
Our role

Federal agency mandated to:

- promote and support postsecondary-based research and training in the social sciences and humanities
- advise the minister of Science

Through grants, fellowships and scholarships SSHRC:

- **Trains** the next generation of talented, creative thinkers and doers
- **Builds** knowledge and understanding about people, cultures and societies
- **Drives** the innovations that address the challenges of today and tomorrow



OUR STRATEGIC PRIORITIES: ADVANCING KNOWLEDGE FOR CANADA'S FUTURE

1

Enable

excellence in a
changing research
landscape

2

Create

opportunities for
research and training
through collaborative
initiatives

3

Connect

social sciences and humanities
research
with Canadians

CANADA FIRST RESEARCH EXCELLENCE FUND

- ↘ Created in 2014 to support research in areas that create long-term economic advantages for Canada.
- ↘ CFREF invests approximately \$200 million per year to support Canada's postsecondary institutions to become global research leaders.
- ↘ 18 CFREF grants have been awarded to 17 institutions.



**CANADA
FIRST**
RESEARCH
EXCELLENCE
FUND

Canada Research Coordinating Committee Consultation

New committee mandated to improve the coordination efforts of Canada's research funding agencies

- New **tri-agency fund** for international, interdisciplinary, fast-breaking, high-risk research is one of five CRCC priorities
- The fund will:
 - reduce barriers to cooperation;
 - increase the flexibility of researchers to adapt to new circumstances; and
 - explore different approaches to the development of new knowledge.

THANK YOU!



Social Sciences and Humanities
Research Council of Canada

Conseil de recherches en
sciences humaines du Canada

Canada



Achieving the Transformational
Global Sustainability Agenda 2030:
What does science have to do with it?

Amy Luers, Ph.D.
Executive Director
Future Earth

Science has helped society to....

- Understand global sustainability challenges
- Characterize the range of global sustainability solutions

- But science has not yet helped to ***drive*** transformations to global sustainability
 - at least not at scale

futureearth

Research. Innovation. Sustainability.

Future Earth works to

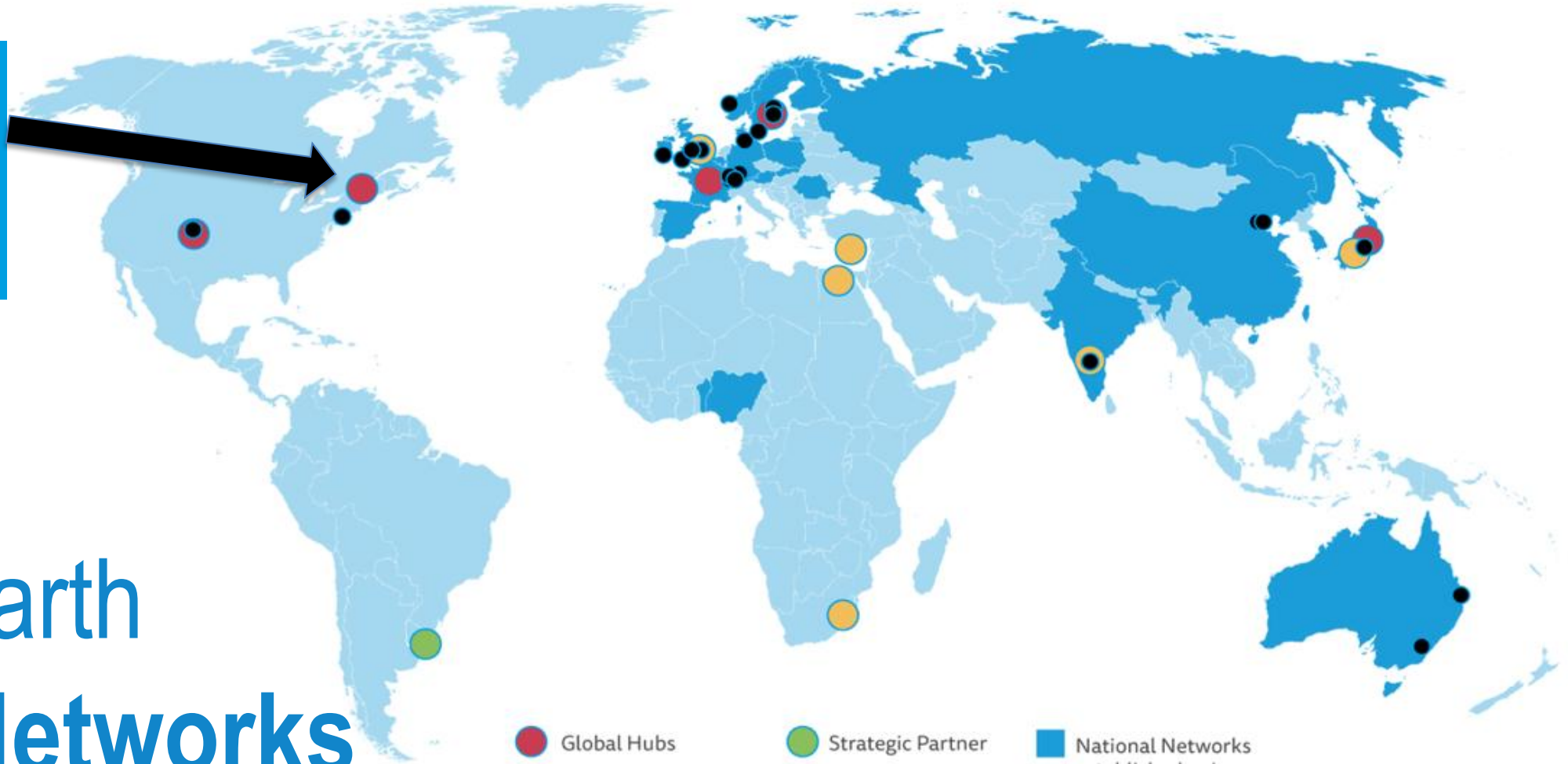
build science and innovation that helps to

drive transformation to global sustainability...

at scale

Collaborating to accelerate transformations to global sustainability

Executive
Office
Montreal



Future Earth
Global Networks

futureearth

Research. Innovation. Sustainability.



Governing Council



Advisory Committee



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Research. Innovation. Sustainability.

Future Earth works to
build science and innovation that helps to
drive transformation to global sustainability...
at scale

HOW?

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Research. Innovation. Sustainability.

What is Transformation?

Systems
Change

A marked change in form, nature, or appearance.

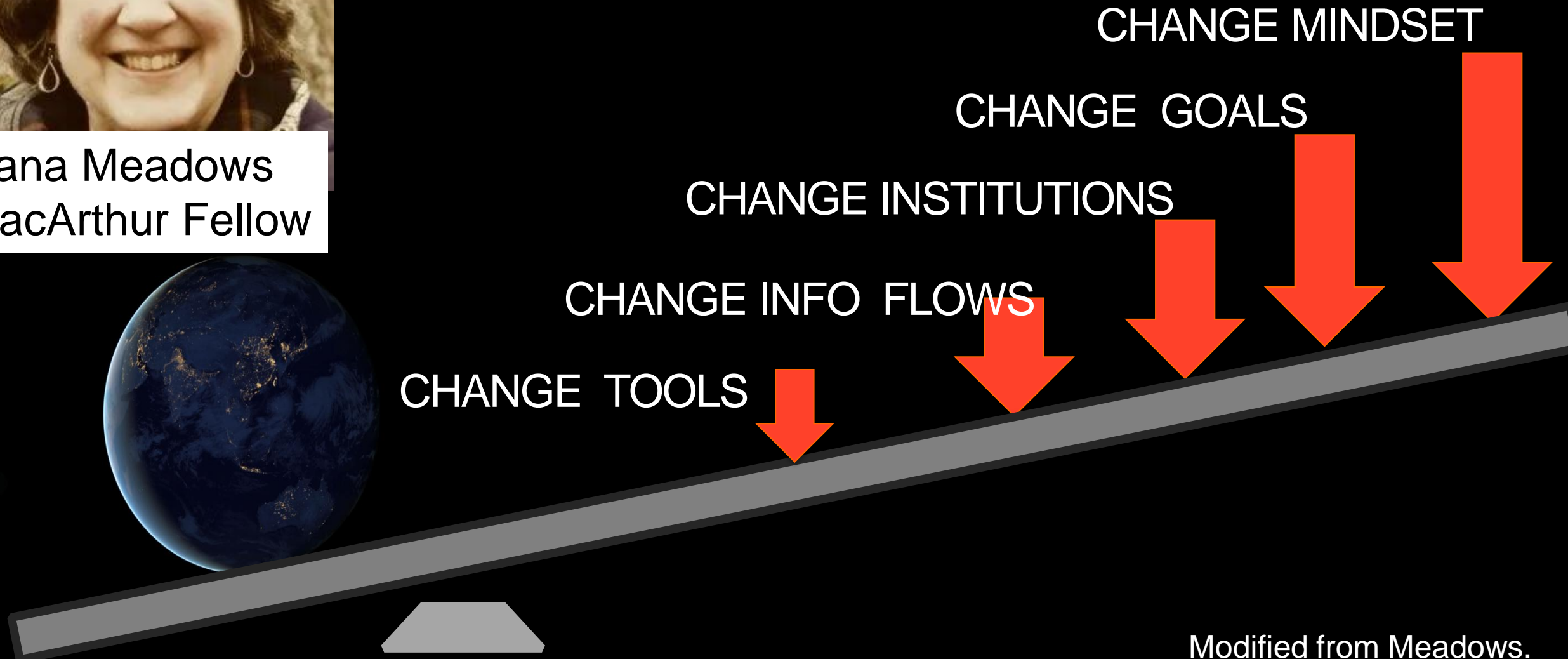
-- Oxford English Dictionary





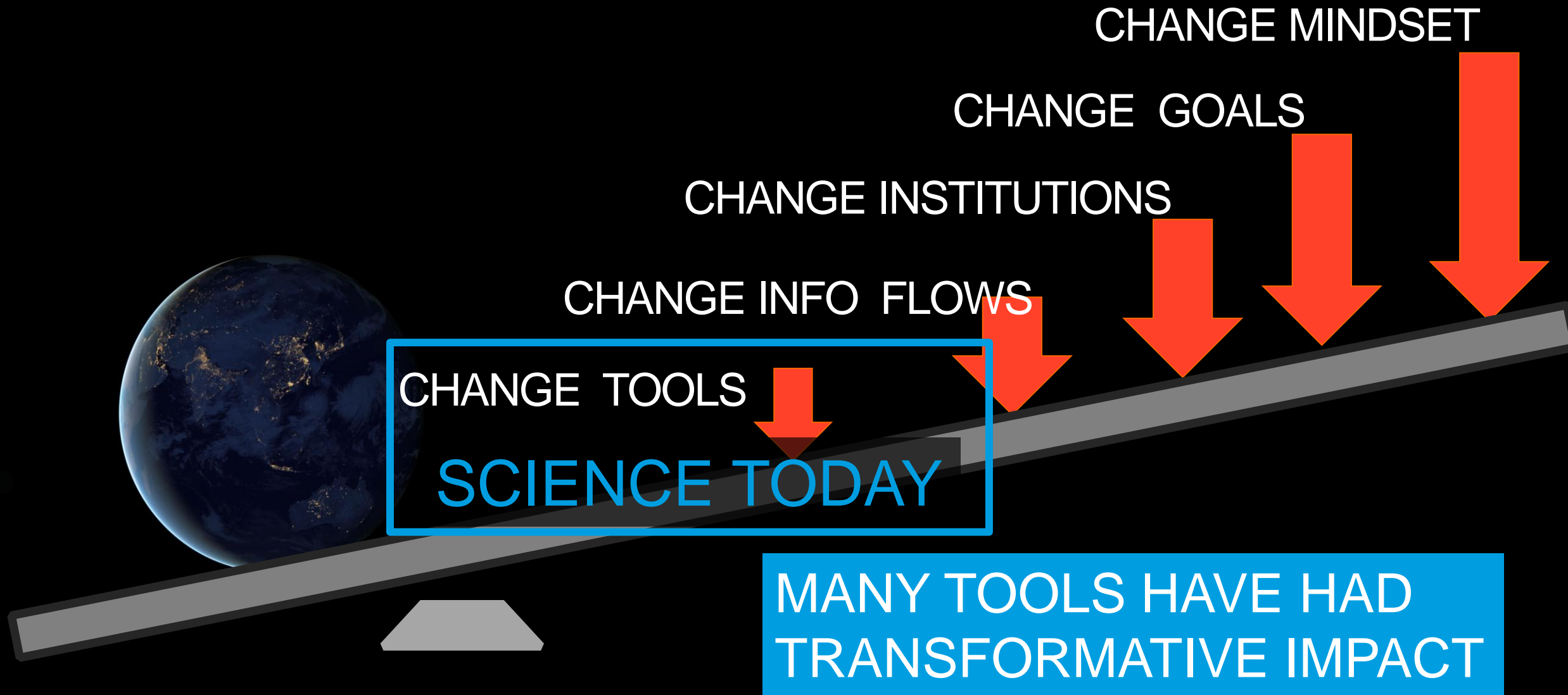
Dana Meadows
MacArthur Fellow

LEVERS FOR SYSTEMS CHANGE and sustainability



Modified from Meadows.

Levers for Transformation



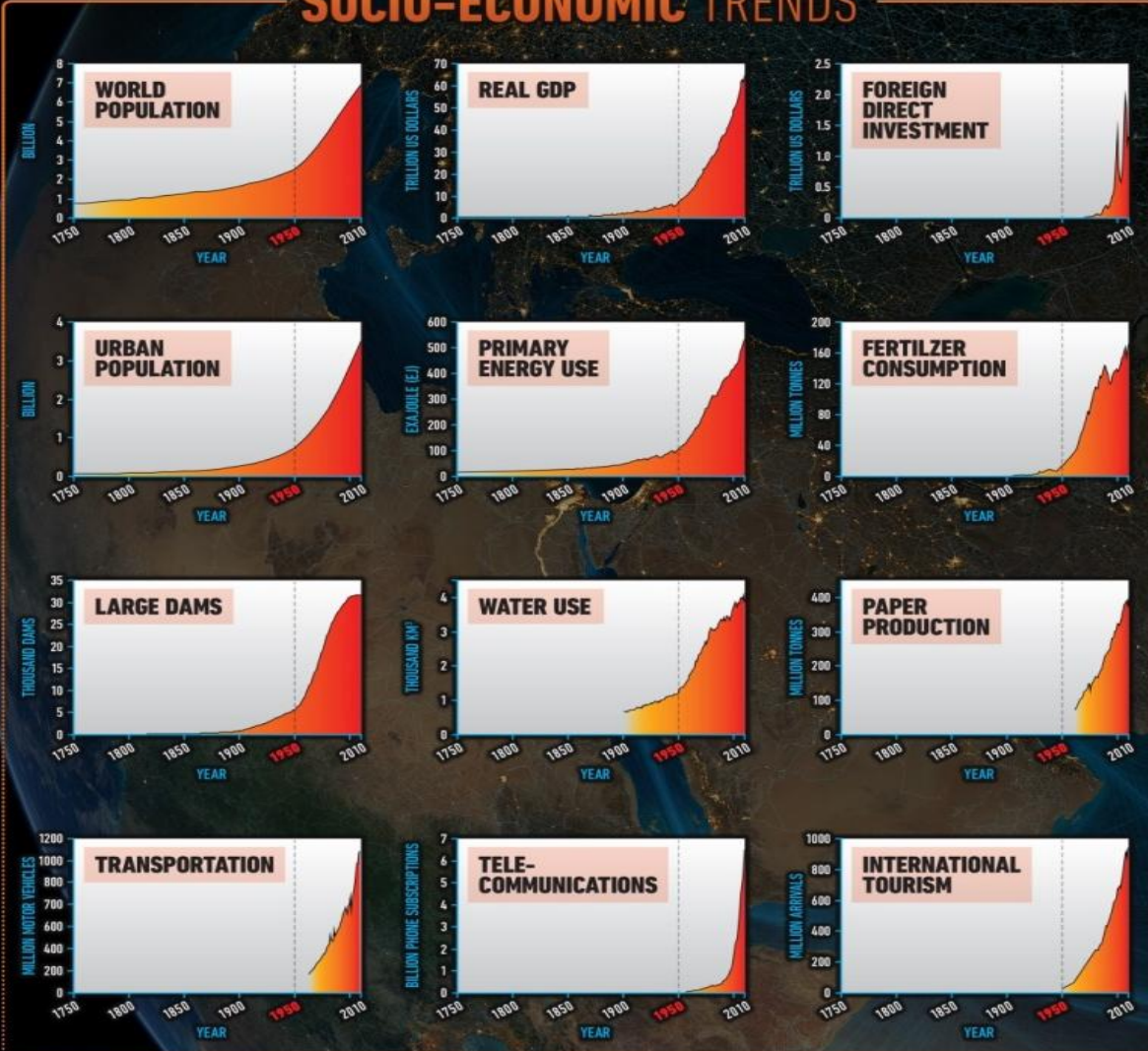
*“WE SHAPE
OUR TOOLS,
AND
THEREAFTER
OUR TOOLS
SHAPE US.”*

Marshall McLuhan

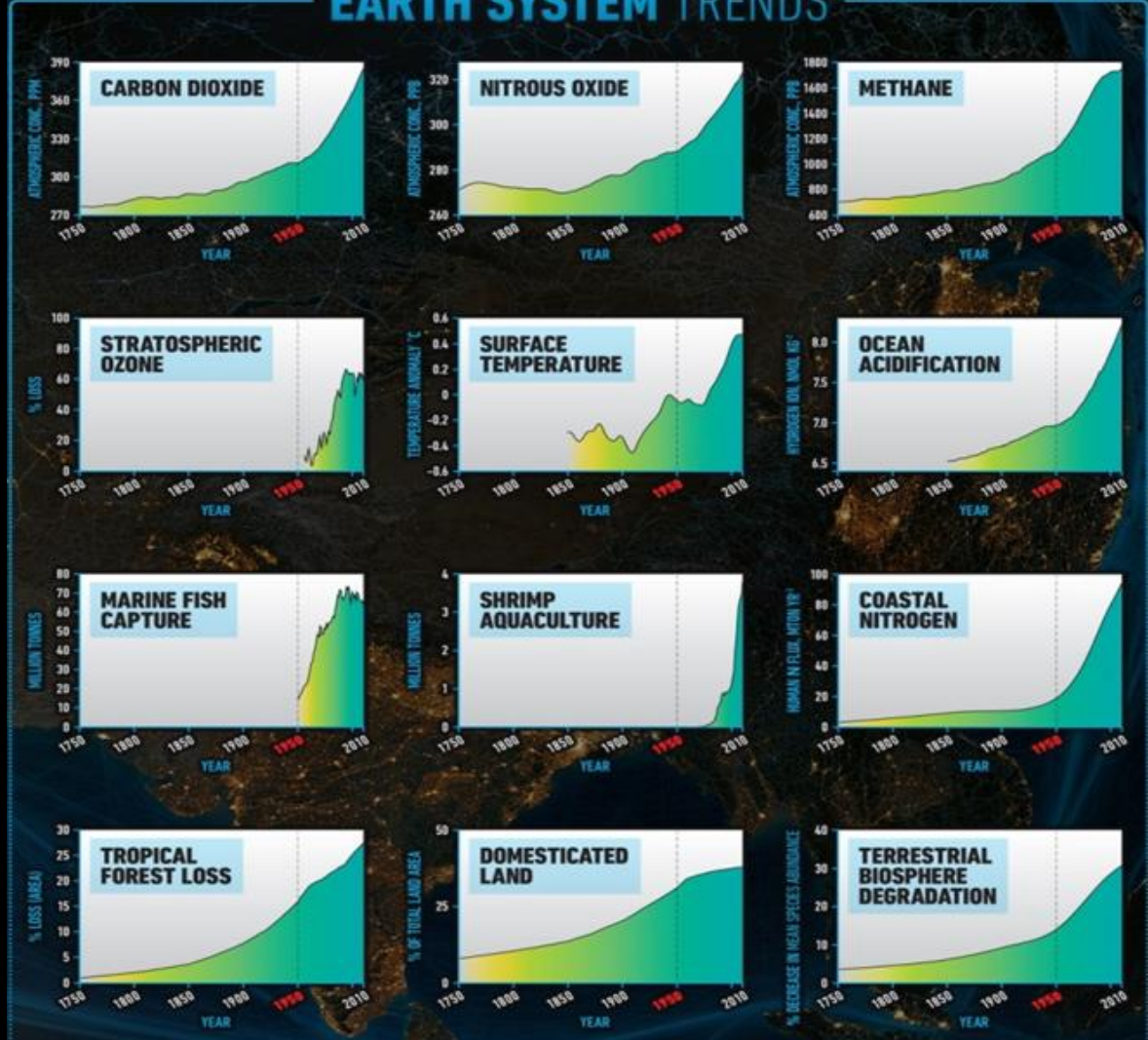


Science ⇒ Transformations of Society & Earth

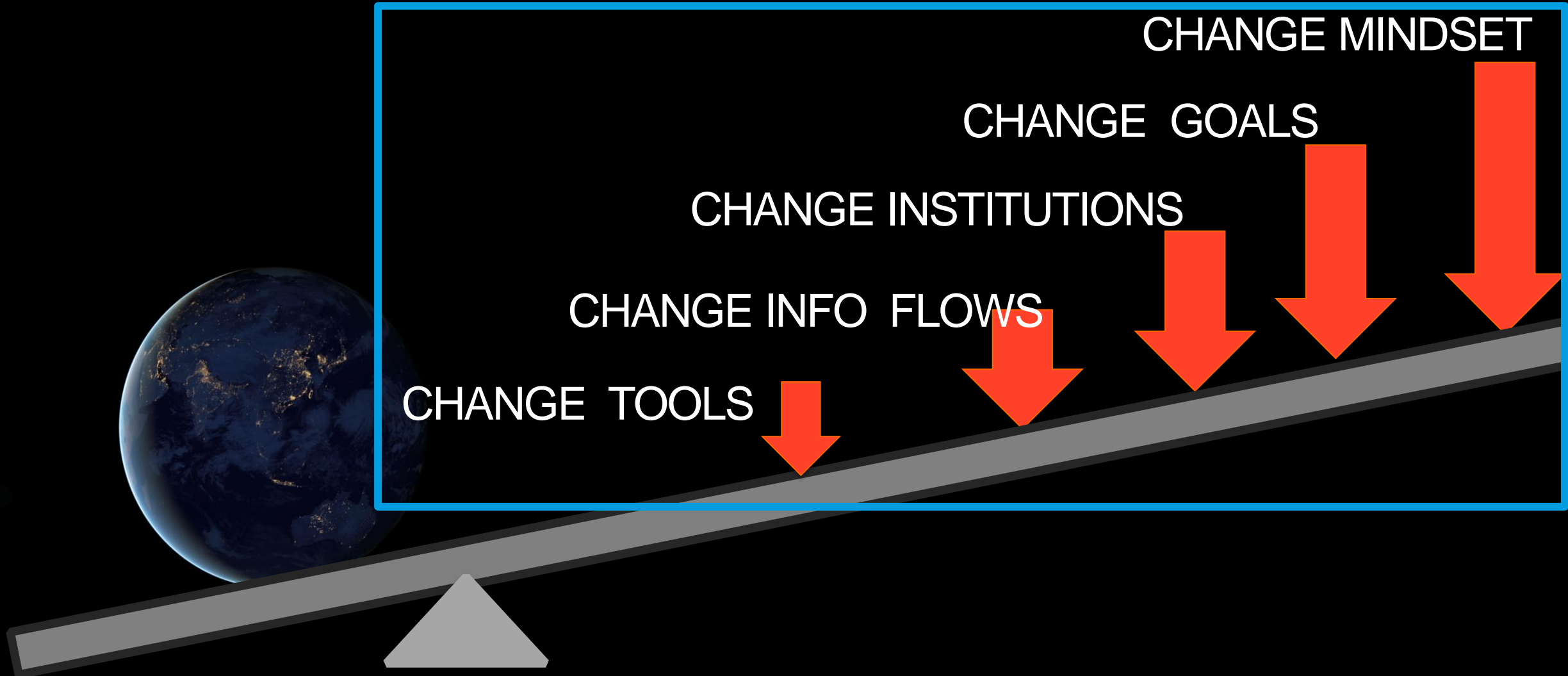
SOCIO-ECONOMIC TRENDS



EARTH SYSTEM TRENDS

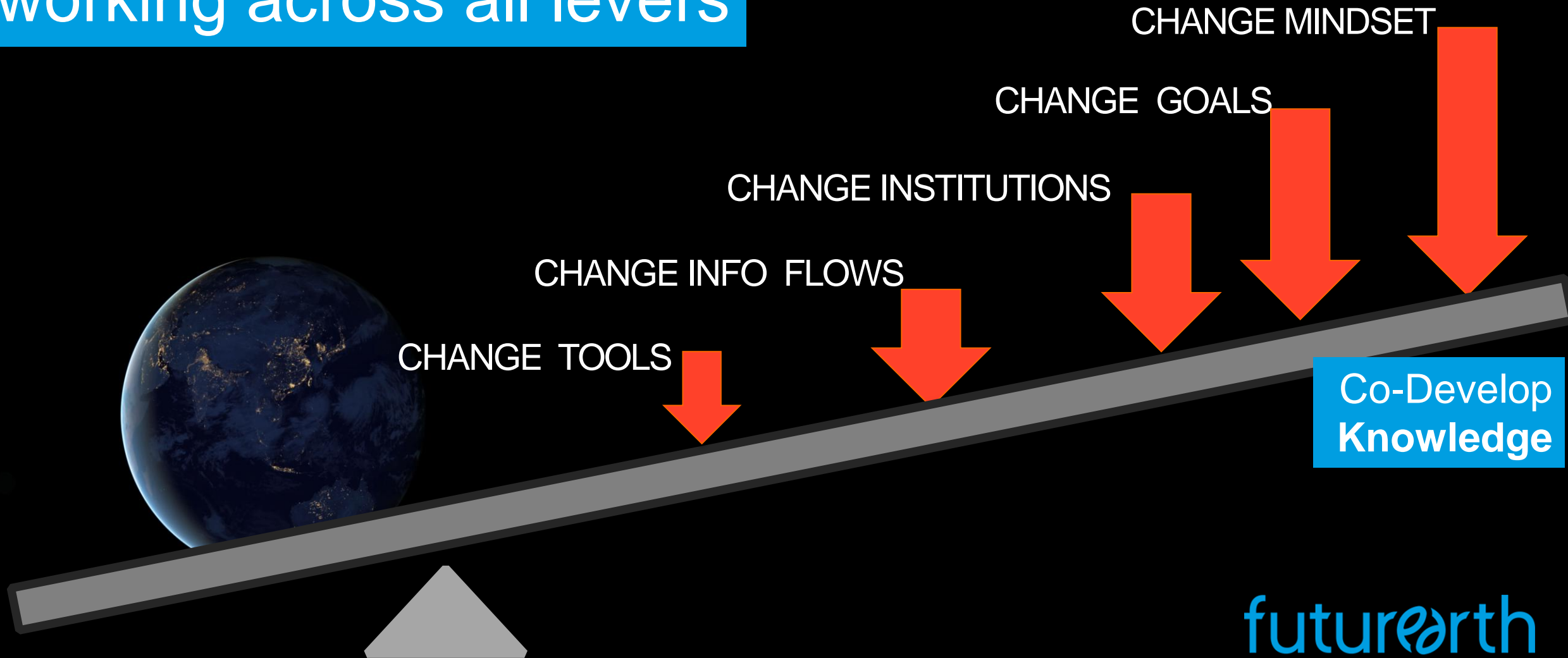


But for Science to purposely drive transformation
must span across all levers



FUTURE EARTH

a global network
working across all levers



FACILITATING TRANSDISCIPLINARY RESEARCH

Co-Develop
Knowledge

CO-DESIGNING SOLUTIONS



The Water Solution
Lab: Bangalore



DIVECHA CENTRE
FOR CLIMATE CHANGE



FACILITATING TRANSDISCIPLINARY RESEARCH



GLOBAL
CLIMATE
ACTION SUMMIT

Co-Develop
Knowledge

CO-DESIGNING SOLUTIONS

30 SOLUTIONS FOR 2030

EXPONENTIAL
CLIMATE ACTION
ROADMAP



SITRA



PART OF THE
M2020
CAMPAIGN

futureearth
Research. Innovation. Sustainability.

Stockholm Resilience Centre
Sustainability Science for Biosphere Stewardship

DRAWDOWN



Co-Develop
Knowledge

FACILITATING CROSS-DISCIPLINE &
CROSS-SECTORAL DIALOGUES



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A NETWORK
of diverse international experts

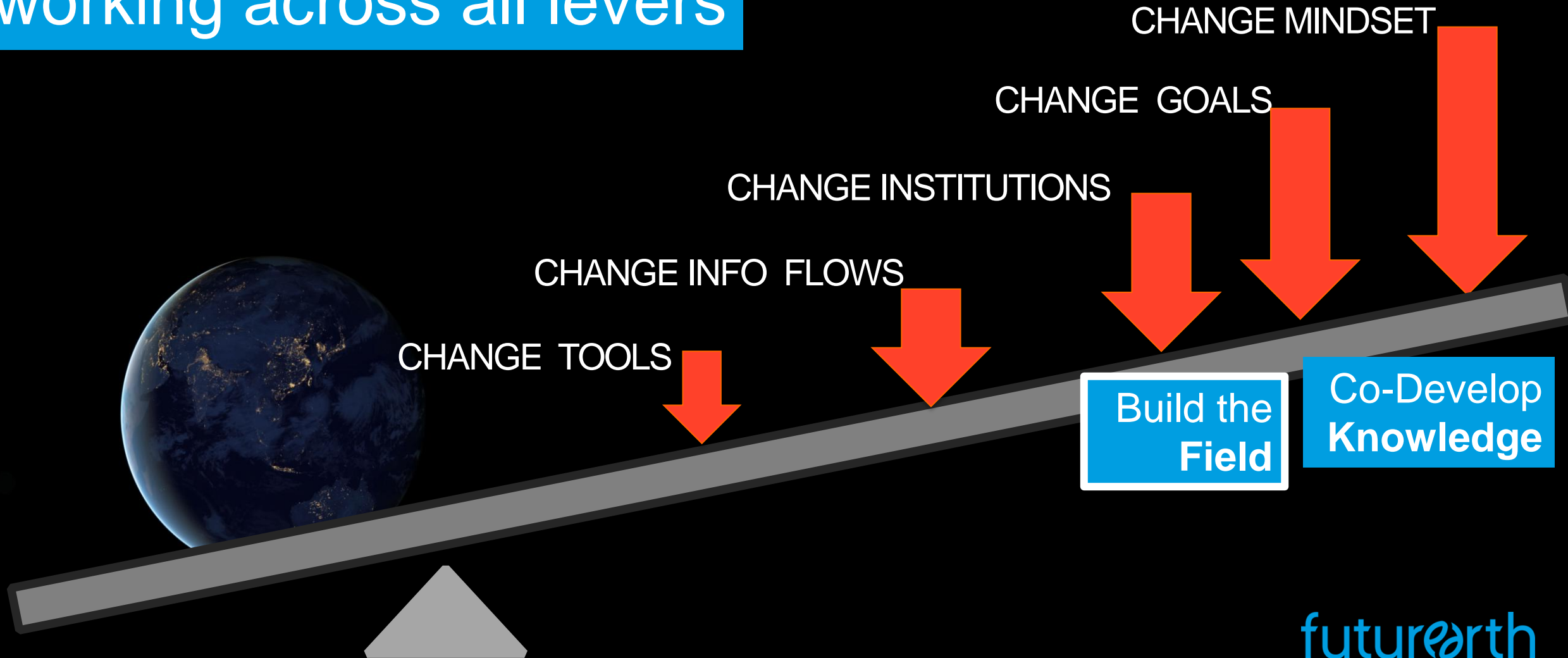
A PLATFORM
for online collaboration

A PROCESS
for asynchronous & facilitated
dialogue

Exploring solutions
to global systemic challenges
together

FUTURE EARTH

a global network
working across all levers



**BUILD
THE
FIELD**

BUILDING THE FIELD GLOBAL TRANSDISCIPLINARY SUSTAINABILITY RESEARCH

Gregory Williams



**EARLY CAREER PERSPECTIVES
ON FUTURE EARTH**
ECOLOGY & CIVILIZATION

14 - 18 AUGUST 2017
on the OPEN NETWORK

SIGN UP NOW: www.tinyurl.com/ecpfe #ECPFutureEarth

STARTING FALL 2018



**Global
Sustain+Ability
Scholars**

Global Sustainability Scholars program is a life-long network of peer and professional change leaders in global sustainability.




Koon-Dooon University

S R I

Sustainability Research and Innovation
2019/2020
A Transdisciplinary Congress Powered by Future Earth and the Belmont

Register Now

PEGASuS
PROGRAM FOR EARLY-STAGE
GRANTS ADVANCING
SUSTAINABILITY SCIENCE

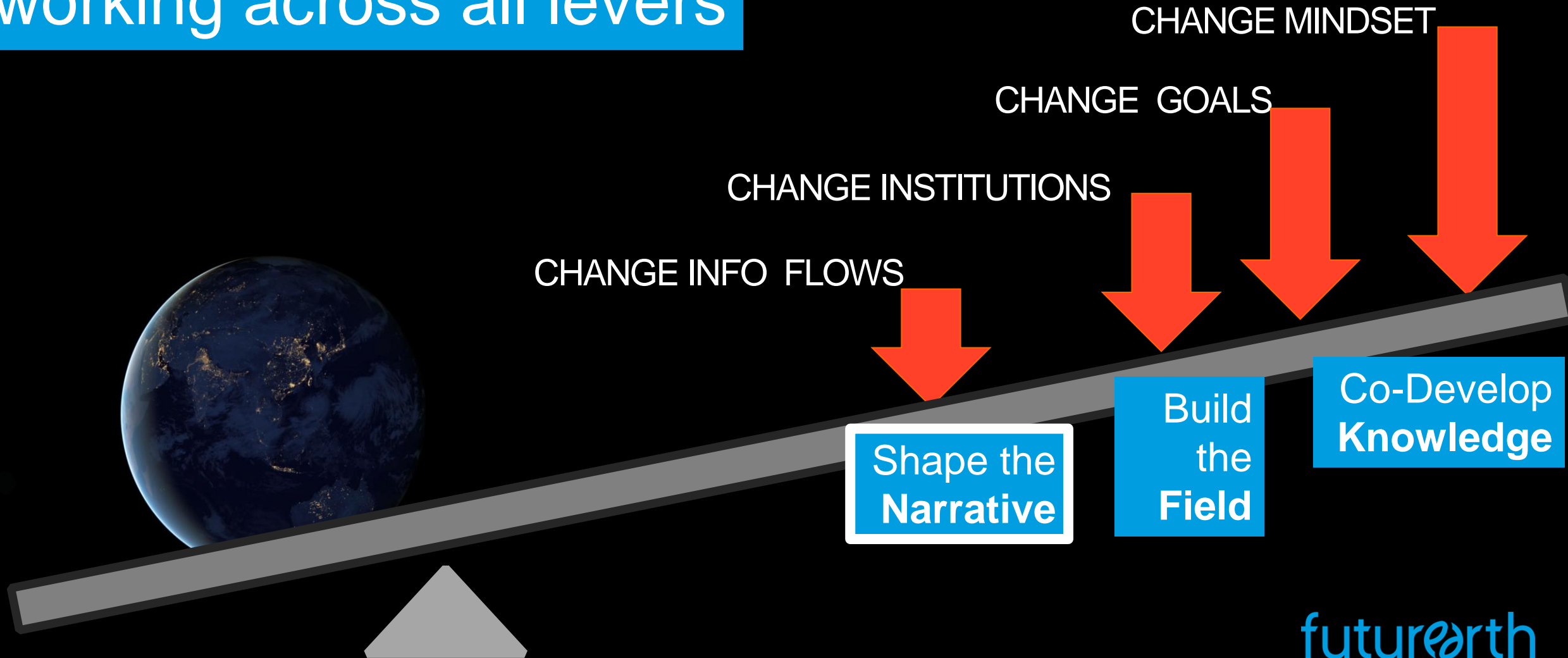


**BELMONT
FORUM**

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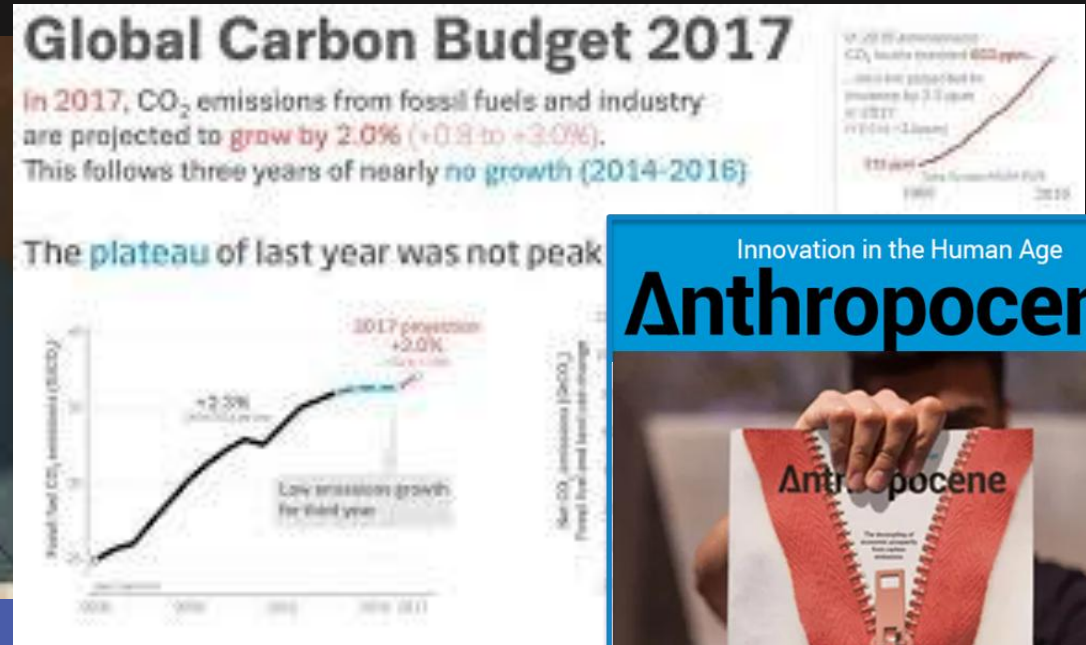
FUTURE EARTH

a global network
working across all levers



SHAPE THE NARRATIVE

SHAPING THE NARRATIVE
integrating research-based knowledge
into policy and public discourse



Future Earth/Earth League

The period of 2016-2017 saw a number of significant climate-related events around the world.

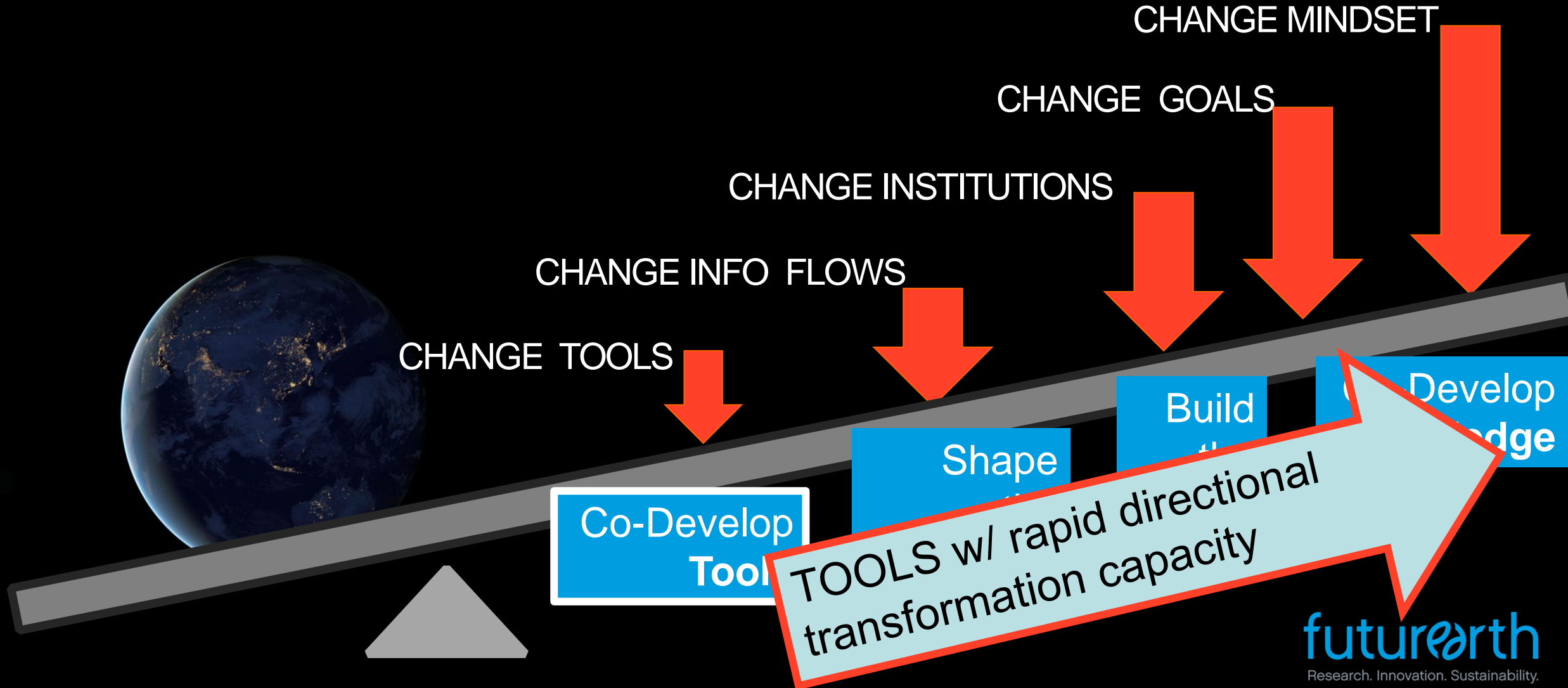
NOVEMBER 13, 2017

10 MUST KNOWS

What are the 10 things all leaders should know when crafting policies on climate change? That question was the focus of a **statement** released by Future Earth and the Earth League at this year's United Nations climate negotiations, or COP23. Check out a **full list** of our resources from this conference in Bonn, Germany and read a **reflection** from Future Earth's Kaela Slavik.

futureearth
media lab

Future Earth – a global network working across all levers



CO-DEVELOP TOOLS

CO-DEVELOP TOOLS
working with societal partners to develop tools to accelerate transformations to sustainability

EARTH TARGETS

SUSTAINABILITY IN THE DIGITAL AGE



- Systems scientists
- Civil society
- Business
- Local government

- Digital Innovators
- Systems scientists
- Social Change Agents

Canada leadership needed in global programs: Earth Targets (Arctic) & Sustainability in Digita

The image shows a screenshot of the Future Earth website. The top left features the Future Earth logo, a stylized 'e' and 'd' in a circle, followed by the text 'Future Earth'. To the right, there is a navigation menu with buttons for 'Home', 'Initiatives', and 'Community'. The main content area has a background image of a coastal landscape with a cliff and a forest. In the center of the image, there are two flags: the flag of Quebec and the flag of Canada. Below the flags, the text reads: 'CANADIAN / QUEBEC RESEARCHERS, INNOVATORS, AND DECISION MAKERS WORKING WITH PARTNERS AROUND THE WORLD FOR GLOBAL SUSTAINABILITY'. At the bottom of the page, there is a white bar with the text 'RESEARCH . INNOVATION . SUSTAINABILITY'. Below this bar, there are four colored boxes representing different community groups: 'MEMBERSHIP' (orange), 'QUEBEC CONSORTIUM MEMBERS' (dark blue), 'GLOBAL COMMUNITY' (green), and 'LOCAL COMMUNITY' (teal).

Future Earth

Home Initiatives Community

fr / en

CANADIAN / QUEBEC RESEARCHERS, INNOVATORS, AND
DECISION MAKERS WORKING WITH PARTNERS AROUND THE WORLD
FOR GLOBAL SUSTAINABILITY

RESEARCH . INNOVATION . SUSTAINABILITY

MEMBERSHIP

QUEBEC CONSORTIUM MEMBERS

GLOBAL COMMUNITY

LOCAL COMMUNITY

Transformations to Sustainability
What does science have to do with it?




CO-DEVELOP
TOOLS

SHAPE THE
NARRATIVE

BUILD THE FIELD

CO-DEVELOP KNOWLEDGE

So far, it has been limited...
*but we are working to
change that*



Partnerships Matter!
**An international transdisciplinary
approach to ocean research**

Canadian Science Policy Conference 2018

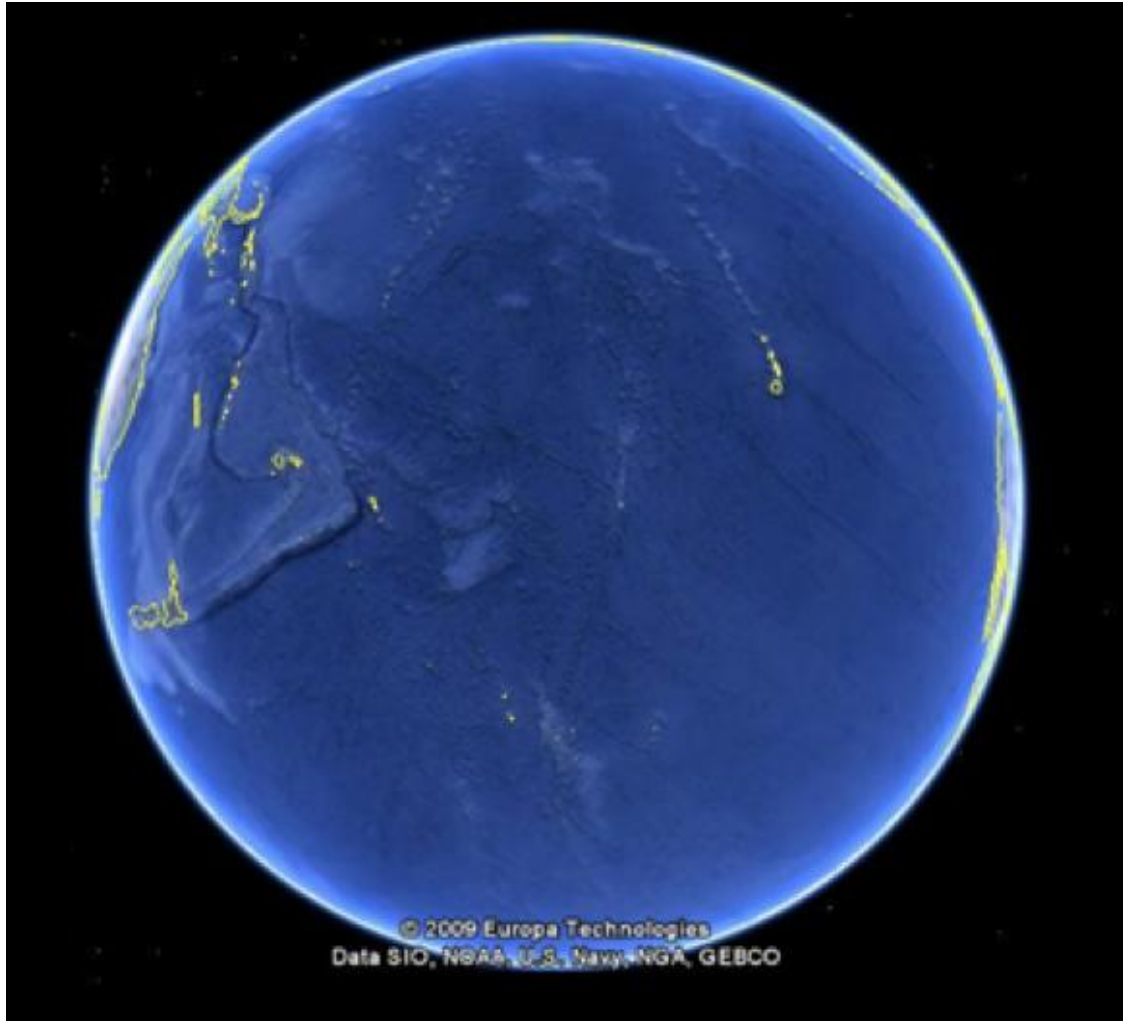
Wendy Watson-Wright, CEO

Ocean Frontier Institute

November 2018

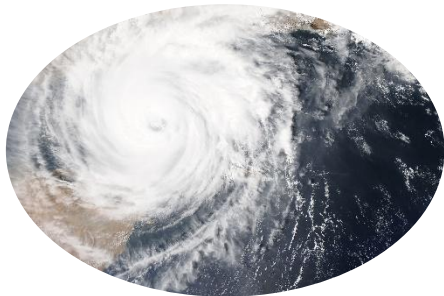


One ocean



“How inappropriate
to call this planet
Earth, when it is
quite clearly Ocean,”
- Arthur C. Clarke

Why this matters ...



The Ocean - a source of social and economic wealth

- Sustains life on earth
- 71% of Earth's surface
- 97% of Earth's waters
- 96% of living space
- Half the oxygen we breathe



- Main source of thermal inertia
- Cultural heritage
- 2.5% global GDP

Huge potential, huge threats

- Ocean acidification: ocean could be 150% more acidic by 2100
- Land-based sources account globally for ~80% of marine pollution
- Plastic expected to outweigh fish by 2050 (WEF)
- >500 dead zones, >245 000km², larger than United Kingdom surface



Canada – From Sea to Sea to Sea

- World longest coastline: 243,042 km
- Canada's ocean surface: 5.6 million km²
- Internal waters: 2,5 million km²
- EEZ 2.9 million km²
- Atlantic, Arctic and Pacific coasts



The Ocean Frontier Institute (OFI)

One ocean | Understanding change | Seeking solutions

*An international transdisciplinary hub for ocean research,
OFI brings together experts from both sides of the North
Atlantic to explore the vast potential of the world's ocean*

**SAFE AND
SUSTAINABLE
DEVELOPMENT OF
THE OCEAN
FRONTIER**

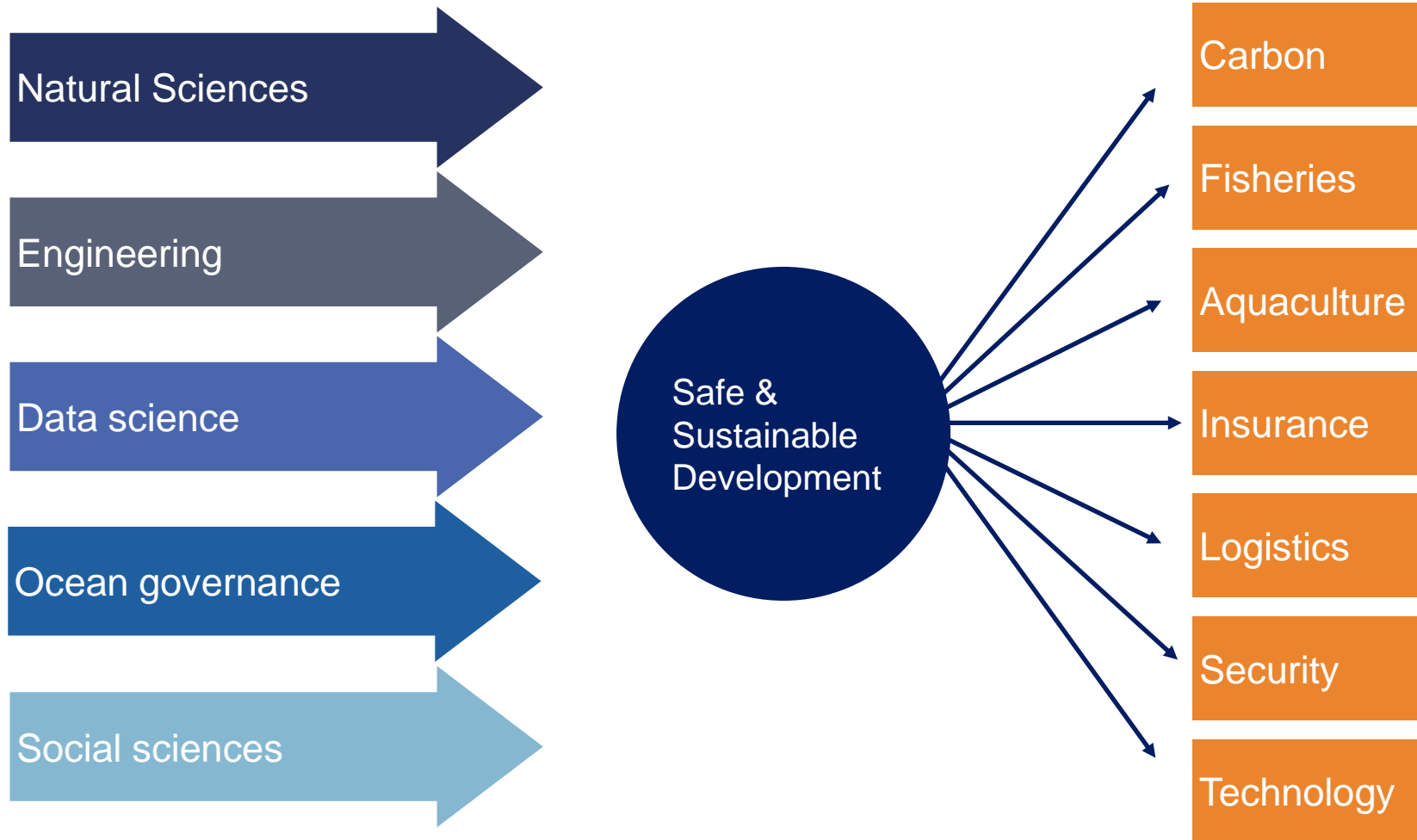


International partners



The Ocean Frontier Institute

Ground-breaking research driving ocean innovation



OFI: sharing tools, technology & expertise



Infrastructure



Research & lab space



Ship access



Collaborative research



The 2030 Agenda -
a global framework
to help governments
and societies achieve
the major goals of
our generation

UN Decade of Ocean Science for
Sustainable Development



United Nations
Educational, Scientific and
Cultural Organization



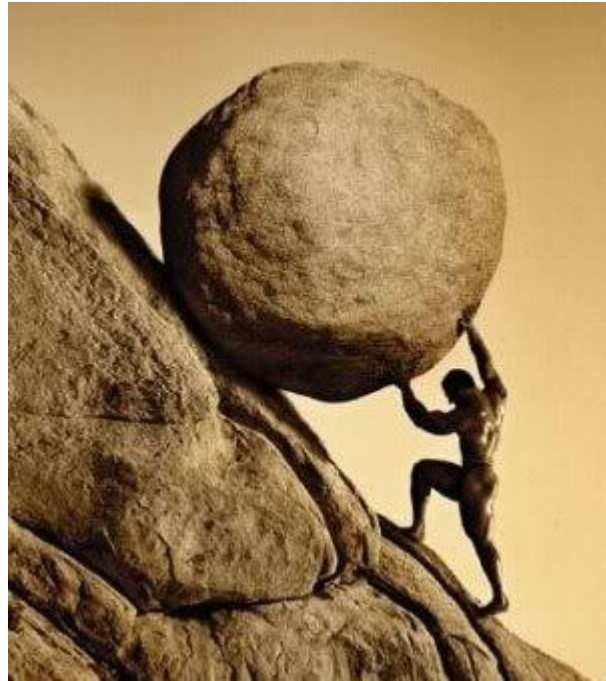
Intergovernmental
Oceanographic
Commission



2021
2030 United Nations Decade
of Ocean Science
for Sustainable Development




Issues that challenge us ...



- One planet ...
- One ocean ...

*MANY opportunities through
collaboration*

Learn more at:
oceanfrontierinstitute.org
 @OceanFrontier

