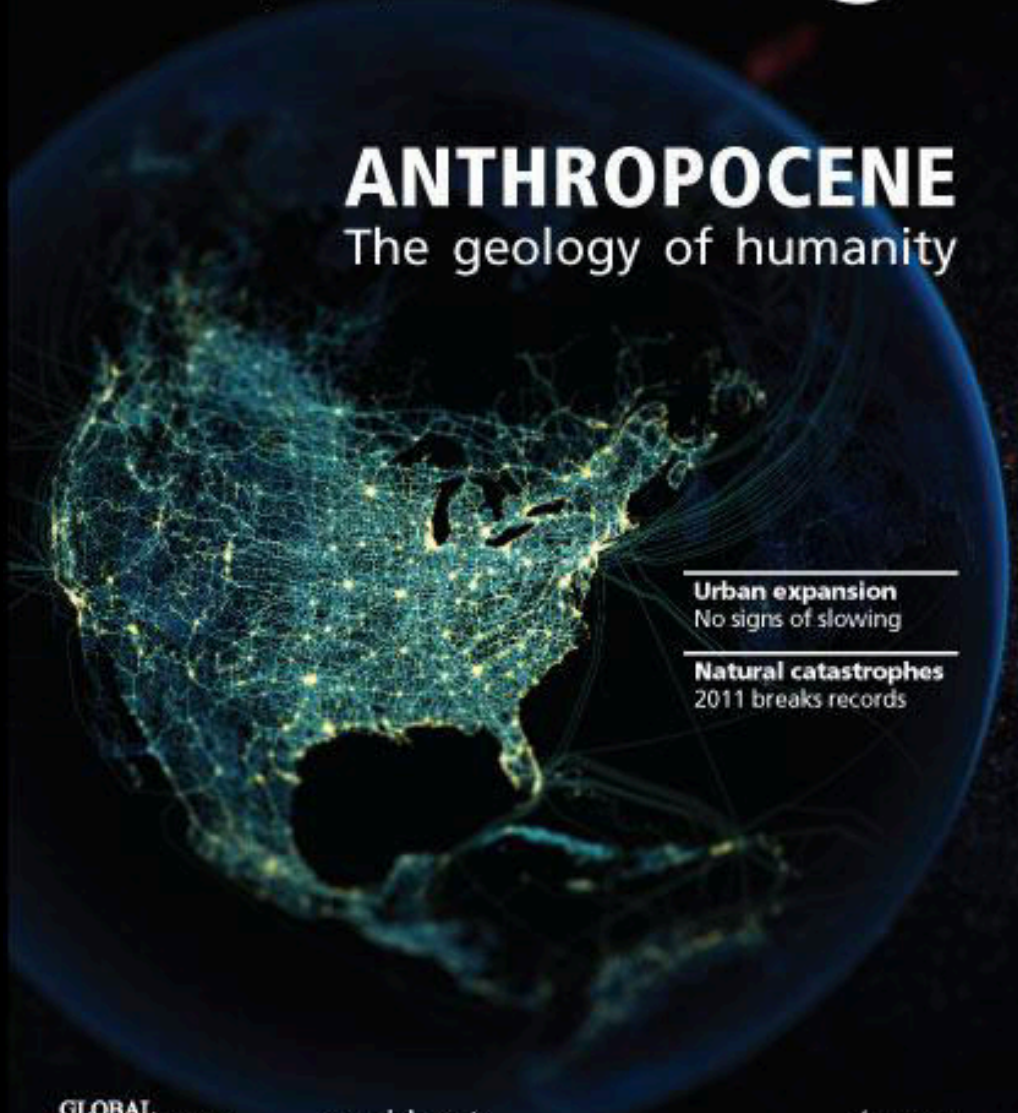
Science and Technology Alliance for Global Sustainability

Global Change

International Geosphere-Biosphere Programme
Issue 78 ▮ March 2012

ANTHROPOCENE

The geology of humanity



Urban expansion
No signs of slowing

Natural catastrophes
2011 breaks records

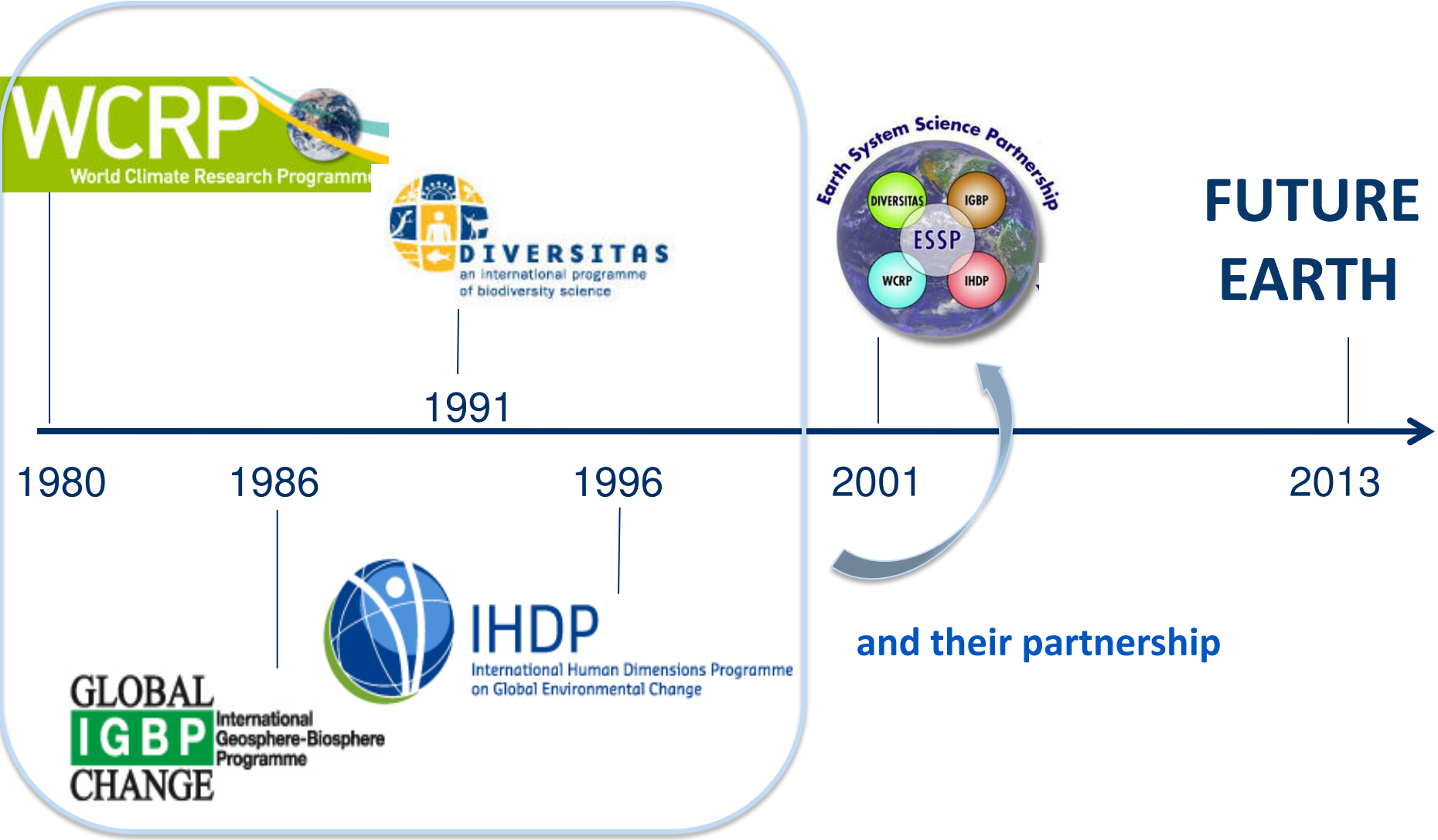
GLOBAL CHANGE IGBP International Geosphere-Biosphere Programme

www.igbp.net
Earth-system science for a sustainable planet

ICSU

Future Earth: building from the GEC programmes

Global Environmental Change Programmes and Projects



Some of the challenges we face

- Feeding 9 billion people within sustainable planetary boundaries
- Valuing and protecting nature's services and biodiversity
- Adapting to a warmer and more urban world
- Transitioning to low carbon societies
- Providing income and fostering innovation around sustainable systems
- Reducing disaster risks
- Aligning governance with stewardship

Complex, daunting…..

The Transition Team








Many disciplines, sectors, regions









for a co-design effort












17 individual capacity members, 12 ex-officio (ICSU, ISSC, Belmont Forum, UNESCO, UNU, UNEP) and Global Environmental Change Programme Directors

photos: www.dawide.com

Future Earth

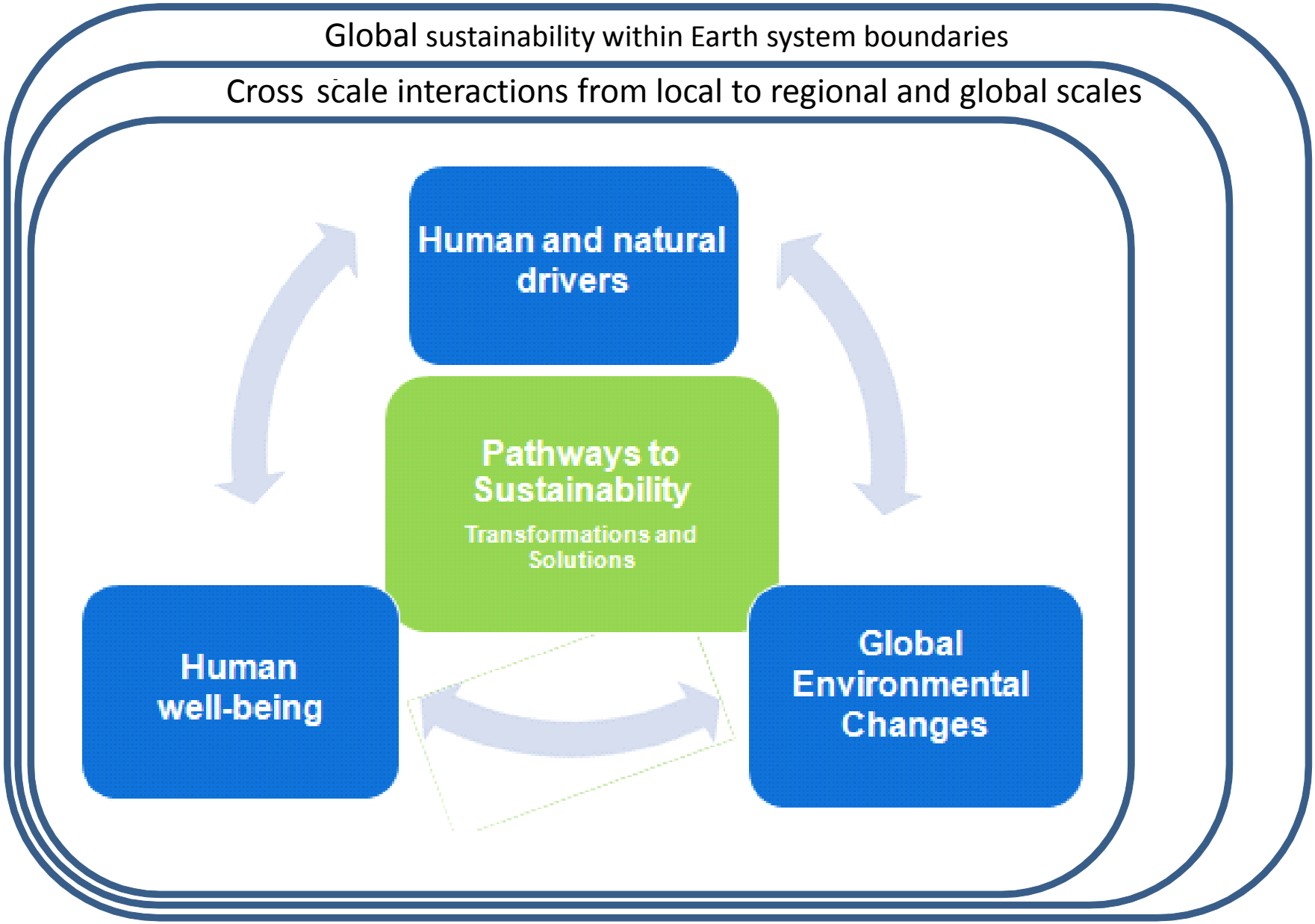
To provide the knowledge required for societies in the world to face risks posed by global environmental change and to seize opportunities in a transition to global sustainability

Future Earth attributes

A global platform
for international research collaboration

- augments earth system science with impacts of environmental change on **people**, adaptation and transformation
- delivers **interdisciplinary** research on global environmental change for sustainable development
- strengthens partnership between researchers/funders/users (**co-design**)

Conceptual framework for Future Earth



	Proposed Research Themes
1	**Dynamic Planet**: Observing, explaining, understanding, projecting earth, environmental and societal system trends, drivers and processes and their interactions; anticipating global thresholds and risks.
2	**Global development:** Knowledge for the pressing challenges to provide sustainable, secure and fair stewardship of food, water, health, energy, materials, biodiversity and other ecosystem functions and services.
3	**Transformation towards Sustainability**: Understanding transformation processes and options, assessing how these relate to human values, emerging technologies and social and economic development pathways, and evaluating strategies for governing and managing the global environment across sectors and scales.

Possible questions

Dynamic Planet:

- What are the states and trends of global change in environmental components and in human drivers?
- What are the risks of crossing regional to global thresholds and planetary boundaries inducing social-environmental crises?
- What kinds of integrated observing systems and data infrastructures are needed to document and model the coupled Earth system?

Global Development:

- What are the patterns, trade-offs and options for equitable use of natural resources, and how can we ensure sustainable access to food, water, clean air, energy, and materials for current and future populations?
- What are the implications of climate change, and how can climate services and DRR reduce these impacts and facilitate adaptation?
- What are the links between biodiversity ecosystems, human wellbeing and sustainable development?

Possible questions

Transformation toward sustainability:

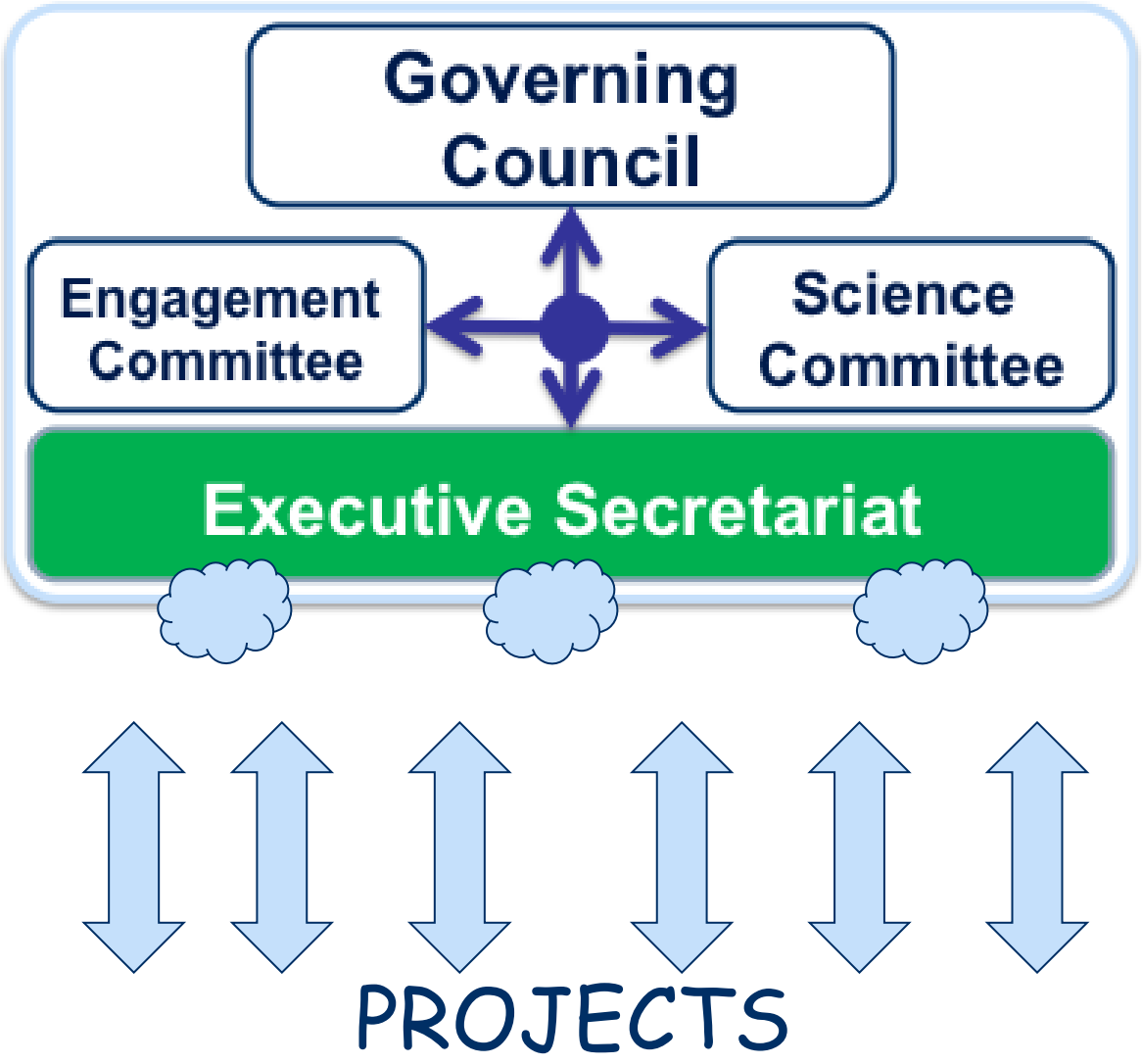
- How can governance and decision-making be aligned to manage global environmental change and promote sustainable development?
- Can emerging technologies provide viable solutions to global environmental change and sustainable development?
- How do values, beliefs and worldviews influence individual and collective behavior toward more sustainable lifestyles, patterns of trade, production and consumption?
- What do we know about past transformations of the Earth system, ideas, technology and economy and how can this knowledge guide future choices?

Future Earth Cross Cutting Capabilities

To facilitate integration across research themes, science will be supported by a set of cross-cutting capabilities in science and outreach (many delivered through partnerships).

	Activity	Possible Partners
C1	Observing Systems	GCOS, GEOSS, …
C2	Data Systems	World Data Systems, …
C3	Earth System Modeling	Modeling Centers
C4	Theory Development	ISSC, Disciplinary unions
O1	Synthesis and Assessments	IPCC, IPBES, AoA, …
O2	Capacity Development and Education	START, UNESCO..
O3	Communication	
O4	Science-Policy Interface and interactions	UNEP..

Governance of Future Earth



Future Earth and SDGs

- Future Earth framed around grand challenges sustainable development
  - A role in providing scientific expertise and advice
  - Solutions-oriented research
  - Interdisciplinary approach
- Co-designed research and science-grounded development agenda/policy meet
- Support for refining SDG targets and monitoring of implementation
- Regional and national Future Earth hubs serving regional & national dimensions of SDGs

Future Earth and SDGs links: How?

- Possible role for the Future Earth committees?
- Providing authoritative scientific statements and digests?
- Possible set-up of a broad SD assessment body?
- Other?

For more information on Future Earth

www.icsu.org/future-earth