



European
Union

CIVITAS SOTERIA

SUMMER SCHOOL 2026
Evidence for Policy in
Disaster Risk Management

Union Civil Protection Knowledge Network

Class n. 8

Exploring systemic cascading
impacts with foresight

Lydia Caldana, Caroline Parquet



Joint Research Centre's EU Policy Lab



A COLLABORATIVE AND EXPERIMENTAL SPACE FOR INNOVATIVE POLICYMAKING

We combine **creative problem solving** and **scientific rigour** to tackle Europe's most complex, interconnected challenges: from technology to sustainability transitions, strengthening preparedness for future risks and more.



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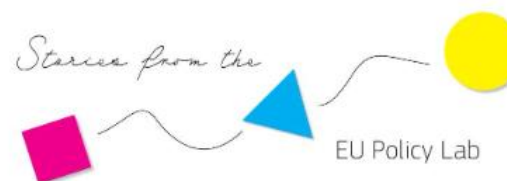
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Quarterly newsletter

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AGENDA

- Opening remarks
- Thematic Keynote:
Wendy Schultz
- Introduction:
Polycrisis Exploration Tool
- Hands-on Activities
 - Coffee Break
- Wrap-Up & Takeaways

Union **Civil Protection** Knowledge Network



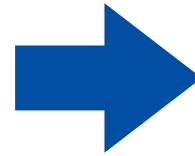
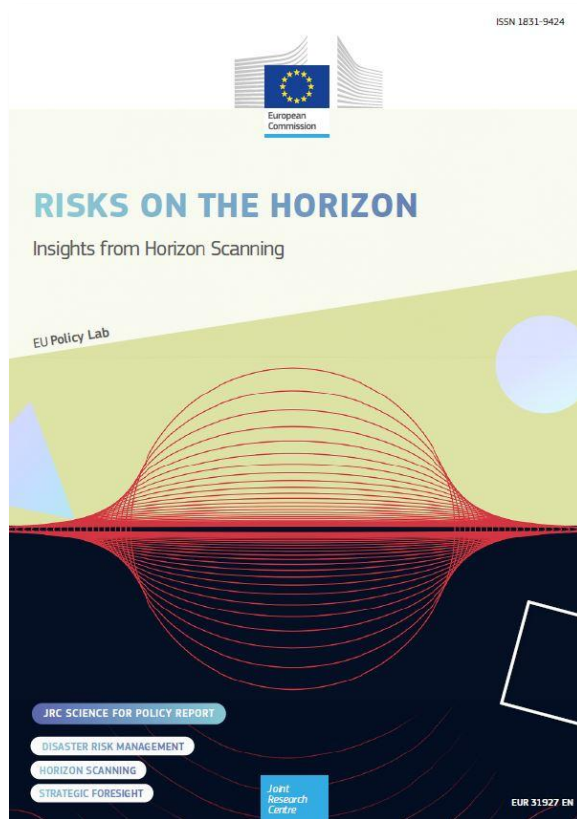
“

*The EU must **look beyond short-term crises** and focus on structural, slow-burning risks (...) that will unfold over the next 10–30 years. (...)*

*By 2040, the EU could face **compounding risks** from biodiversity collapse, AI-driven labour market shifts, and geopolitical fragmentation. **Foresight** helps us map these intersections today.*

Navigating a complex risk landscape:

The workshop turns the *foresight report* into a practical tool that puts the *40 identified risks* to use through engaging risk cards



THEMATIC KEYNOTE:

WENDY SCHULTZ

HYPHAE



**When we're talking
about futures,
we're talking about
time and change.**

What is foresight?

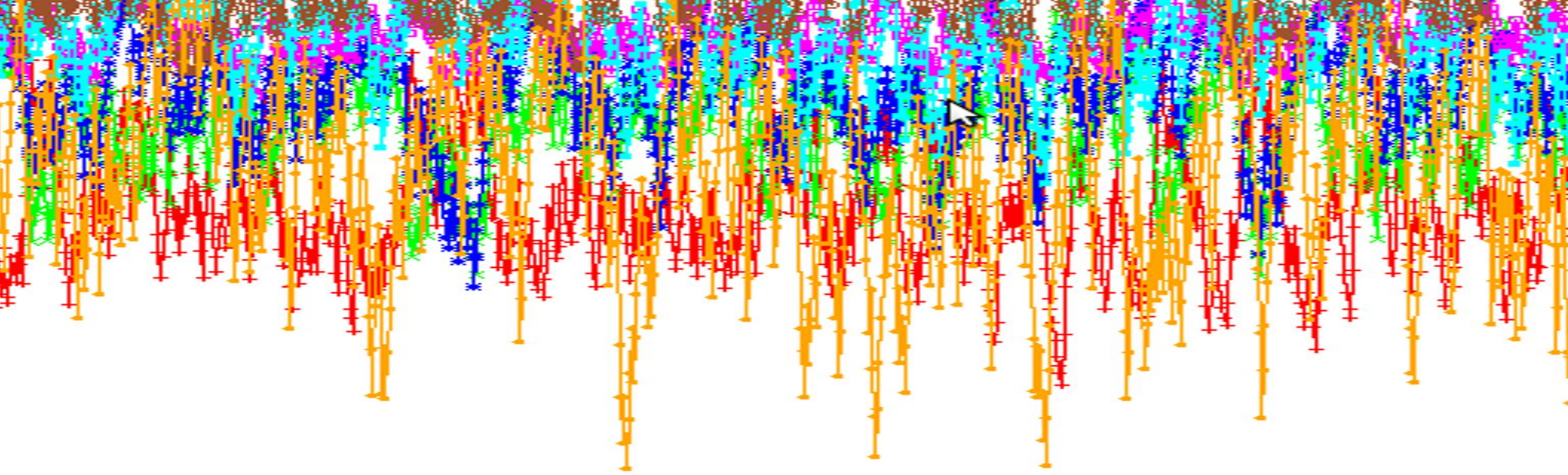
Foresight is inherently focused on chaos;
how people as complex adaptive systems
navigate the turbulence of change.

Exploring; not Predicting

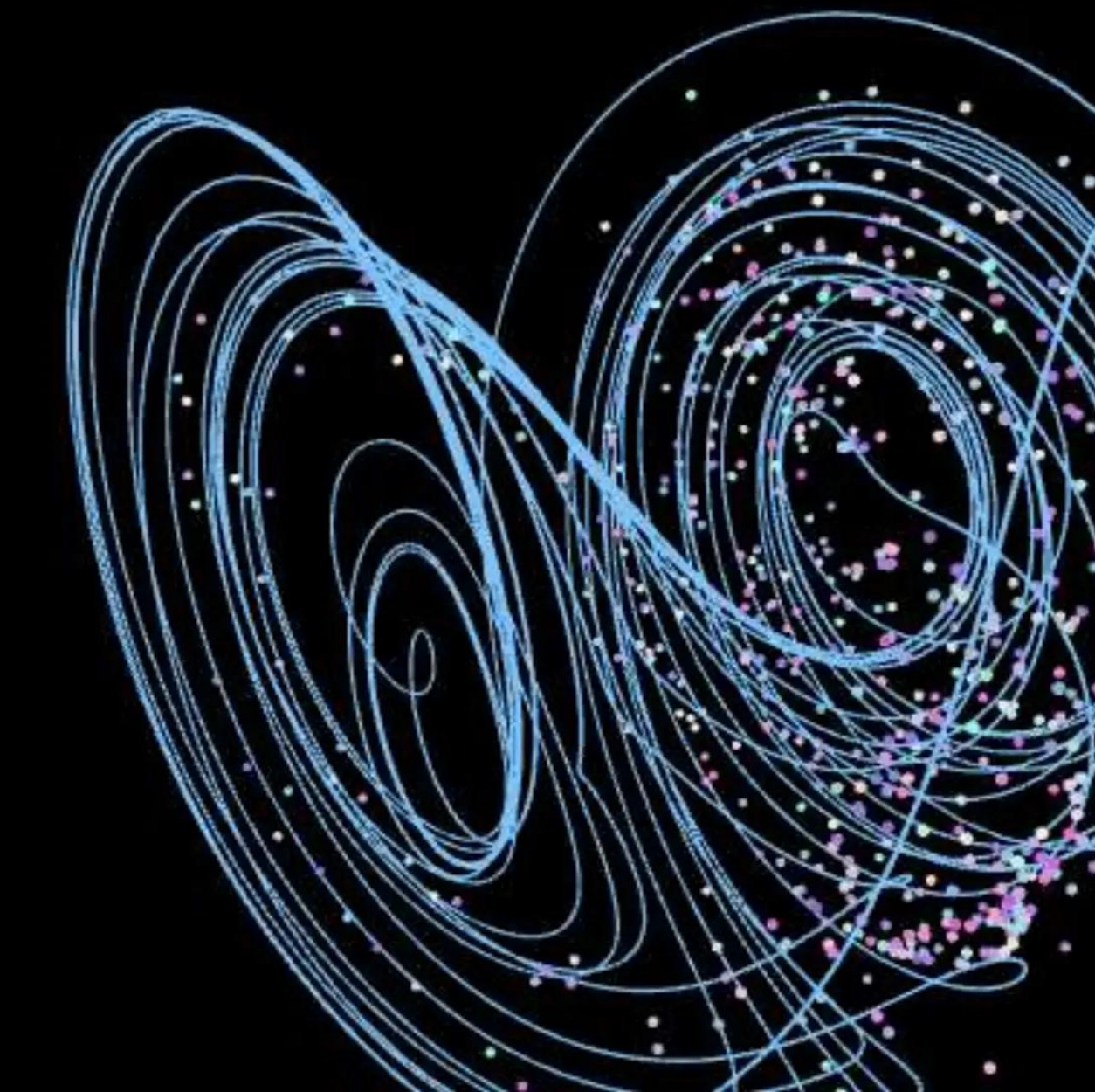


There is an 80% chance that
tomorrow it rains

FORECAST



**All our futures are emergent properties
of an interplay of myriad changes...**



**...their collisions
create turbulence,
and we adapt; each
adaptation drives a
different outcome.**

There are no 'future facts'...

**...only an infinity of images
of our imagined futures.**

Key activities in futures research and foresight

FUTURES THINKING + FORESIGHT

1

**AWARENESS
OF CHANGE**

2

**CRITIQUING
IMPACTS OF
CHANGE**

3

**EXPLORING
ALTERNATIVE
FUTURES**

4

**VISIONING
PREFERRED
FUTURES**

5

**ACTING TO
CREATE
CHANGE**

The objectives of futures research and foresight

Explore to perceive the world anew, to map the possibilities, the opportunities and the risks, to tell new stories, to set aside used futures no longer fit for purpose and borrowed futures that do not fit our unique needs, to decolonise our futures, to collaborate to envision just and sustainable futures, ...
to act to create the futures we desire.

We are in the position of a tourist who is planning a journey with the help of a guidebook that is already out of date.

Bertrand de Jouvenel



Why futures?

Why now?

Why here?

Postnormal times (PNT) are characterized by a context “in which ‘facts are uncertain, values in dispute, stakes high and decisions urgent’.”

- Funtowicz and Ravetz

TIPPING

POINTS

Nine "tipping points" where a changing climate could push parts of the Earth system into abrupt or irreversible change.

Greenland ice sheet disintegration

Irreversible retreat of the ice sheet caused by rising temperatures

Sea level rise (up to 7m)

Permafrost loss

Abrupt increase in emissions of CO₂ and methane through the thawing of frozen carbon-rich soils

Greenhouse gas release

Atlantic meridional overturning circulation breakdown

Shutdown of the AMOC caused by an increased influx of freshwater into the North Atlantic

Regional cooling

Disruption to ocean ecosystem

Boreal forest shift

A shift in boreal forests, seeing expansion into tundra to the north and dieback to the south

Ecological shift

Regional warming

TIPPING POINTS + IMPACT CASCADES

Biodiversity loss

Decreased rainfall

Deforestation and hotter, drier conditions causing dieback of the rainforest and a shift towards savannah

Amazon rainforest dieback

Sea level rise (up to 3m)

Collapse of the ice sheet triggered by persistent grounding-line retreat in one sector, cascading to other sectors

West Antarctic ice sheet disintegration

Disruption to agriculture
Ecosystem change

An abrupt change in Sahel rainfall, caused by a shift northwards (wetter) or southwards (drier) in the West African monsoon

West African monsoon shift

Disruption to agriculture

Greater rainfall extremes

A strengthening of the monsoon caused by rising CO₂ emissions or a weakening as a result of high aerosol emissions

Indian monsoon shift

Ecosystem change

Losses to fisheries and tourism

Rising temperatures pushing warm water corals beyond tolerable levels of thermal stress into an alternative state dominated by macroalgae

Coral reef die-off

● Melting

● Biome shift

● Circulation change

Planetary Solvency Climate change Risk Impact

Planetary Solvency–
Global risk management
University Exeter,
Institute and faculty of
Actuaries
January 2025

**Focus on
Human mortality**

Current Radiative heat
forcing leads to 2.4°C
(J. Hansen et al,
Global warming in the
pipeline, Nov. 2023)

That's >2 billion deaths
on the line.

By 2050

3°C
**>4 billion
deaths**

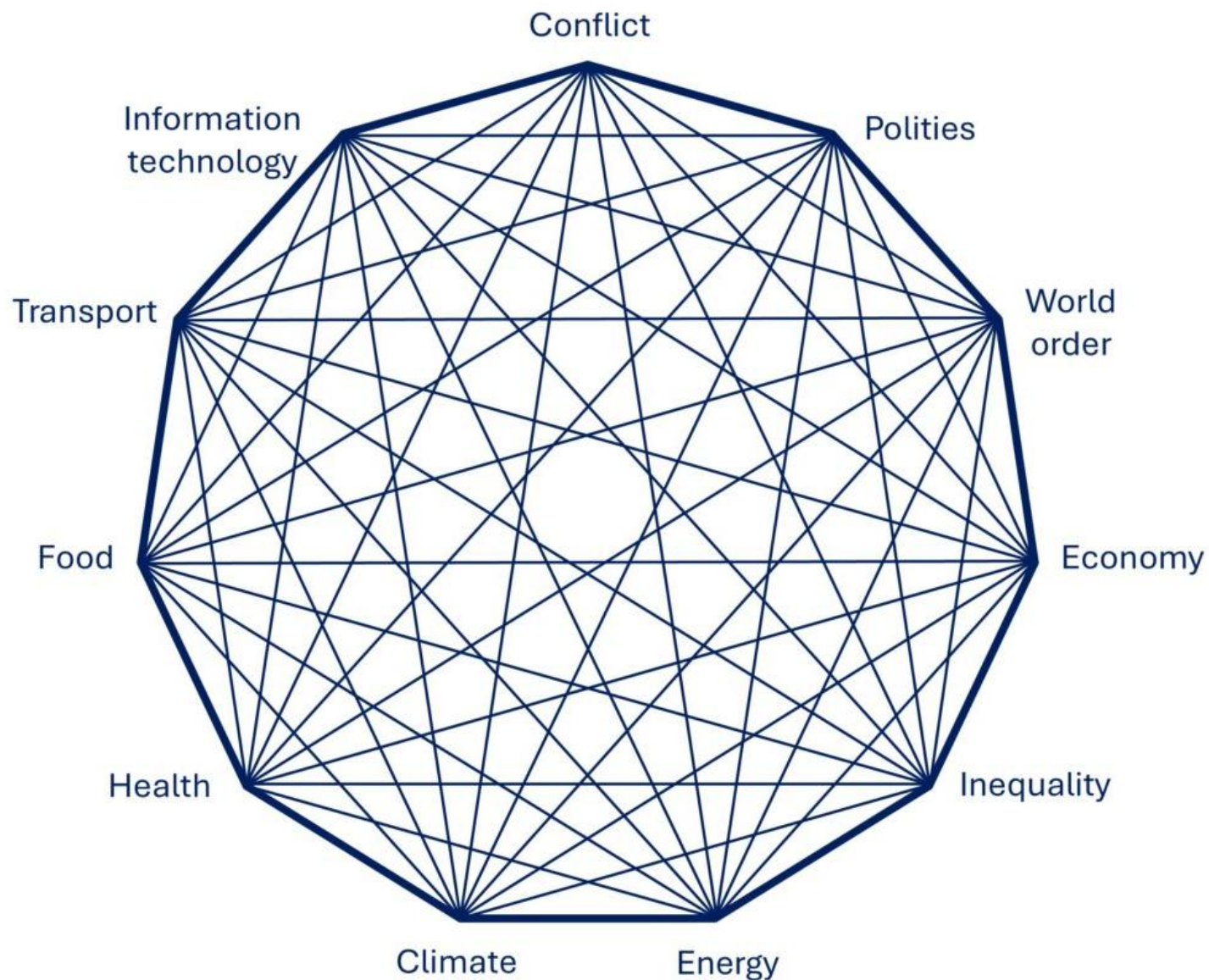
>2°C
or more
**>2 billion
deaths**

Limited to 2°C
**>800 million
deaths**

Limited to 1.5°C
following overshoot
**>400 million
deaths**

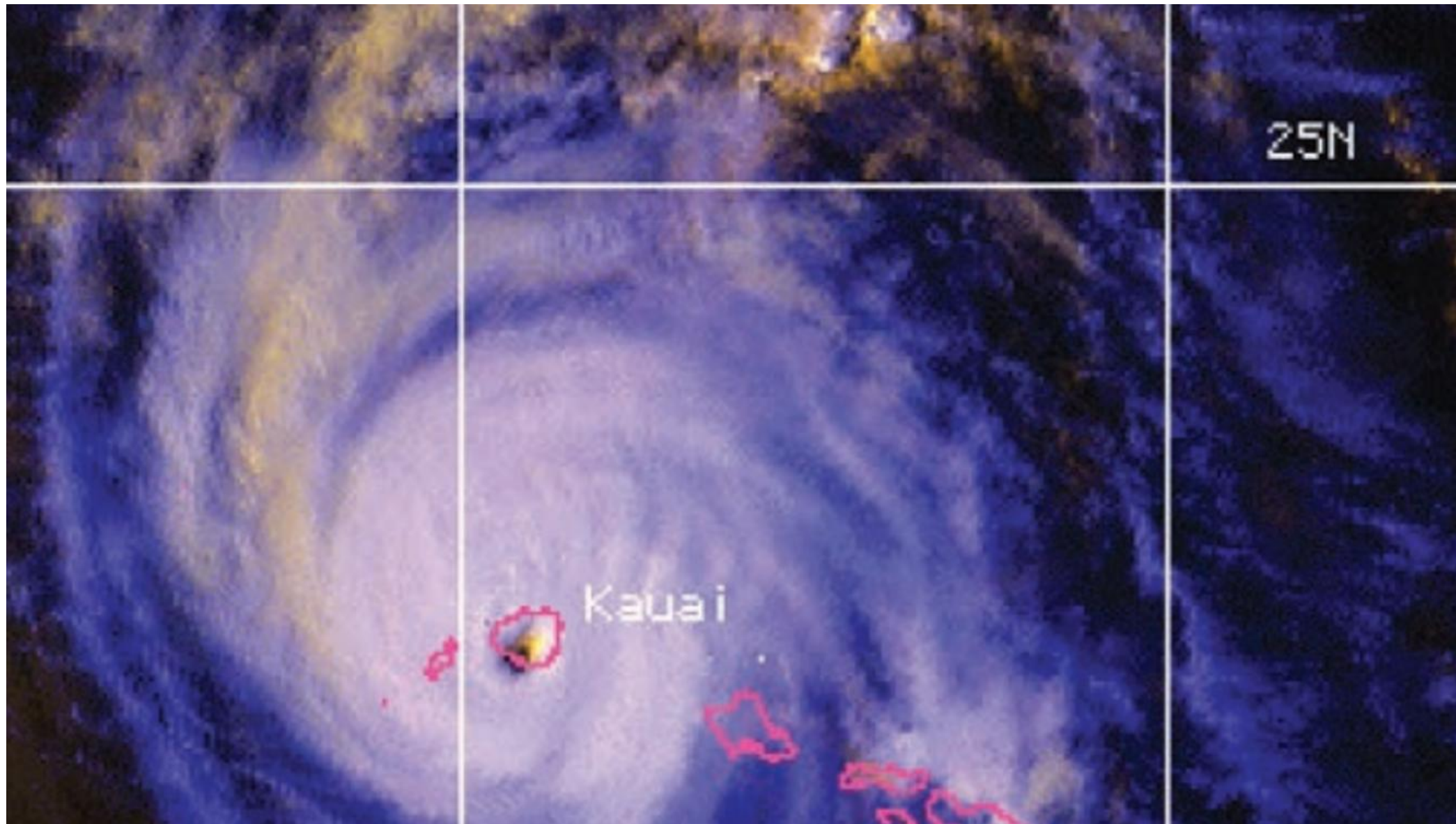
		Rating	Human mortality	Financial Impact	Non-financial Impact
Climate				GDP losses	Nature
3°C or more by 2050. Multiple tipping points triggered Tipping cascade		Extreme	> 4 billion deaths	≥50%	Breakdown of several critical ecosystem services and Earth systems. High level of extinction of higher order life on Earth.
2°C or more by 2050. High number tipping points triggered, partial cascade		Catastrophic	>2 billion deaths	≥25%	Breakdown of some critical ecosystem services and Earth systems. Major extinction events in multiple geographies. Ocean circulation severely impacted.
Global warming limited to 2°C by 2050. Several tipping points triggered		Decimation	> 800 million deaths	≥10% >\$10 trillion annual losses	Severe reduction in several critical ecosystem services. Major extinction events in some geographies. Frequent global food and water crises.
Global warming limited to 1.5°C by 2050 following overshoot. Some tipping points triggered		Severe	> 400 million deaths	≥5% >\$5 trillion annual losses	Some impacts to critical ecosystem services. Ongoing species extinction. Regular global food and water crises.

Peter Carter, Climate Emergency Institute



**Everything
Everywhere
All At Once**

THE POLYCRISIS



Rationale - thinking about how systems change

Internal change - the changes we can *create*

External change - the changes we must *acknowledge*

Collaborative methodologies

Fewer blind spots when we *all* work to spot change

Fewer people left behind when we *all* envision futures



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POLYCRISIS EXPLORATION
TOOL

Polycrisis Exploration Tool: Foresight in Disaster Preparedness

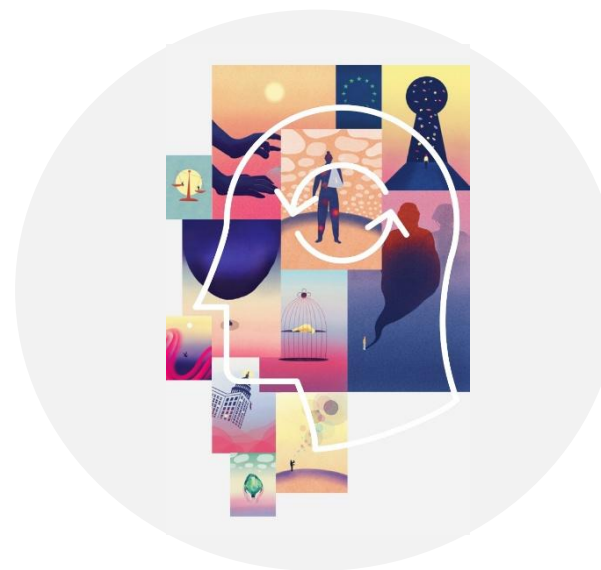
FORESIGHT

- **THINK SYSTEMICALLY**
- **IDENTIFY INTERCONNECTEDNESS**
- **THINK CREATIVELY**
- **BUILD COLLECTIVE INTELLIGENCE**

- Complement your stress-testing and risk assessment methodologies
- Understand the mechanisms of polycrises

- Identify roles, stakeholders and resources
- Create innovative policy action options to avoid crises

IN A POLYCRISIS SETTING



THAT ALLOWS TO



Workshop Focus:

Crisis Management in 2036



By 2036, crisis management will necessitate an adaptable and holistic approach to address the multifaceted nature of crises.

We will explore intricacies, focusing on identifying potential stressors and cascade effects that might arise from concurrent economic, environmental, social, and geopolitical disruptions.

Hands-on Activities:

**Coffee whenever wanted/needed*

ACTIVITY 1:

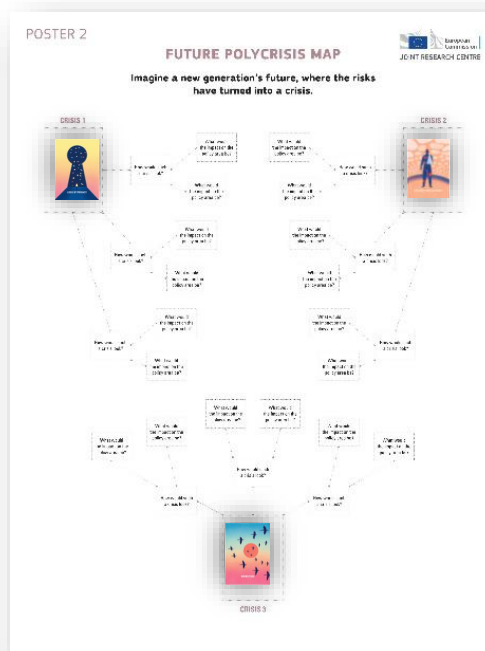
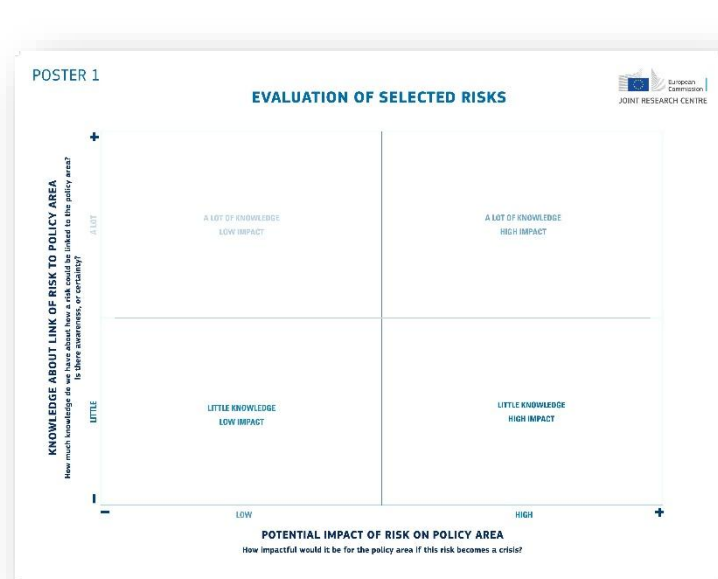
Enhance risk awareness by exploring the broad spectrum of risks

ACTIVITY 2:

Explore cascading impacts of and interconnections between crises

ACTIVITY 3:

Ideate feasible and bold policy interventions to mitigate polycrisis outcomes



Outcome to be mitigated:

Brainstorming

Feasible Policy Mitigation

Sentence must begin with an action verb and mention the key stakeholder(s) responsible for carrying it out.

Action plan

Write down the things that need to happen for your feasible policy mitigation to come true successfully.

Outcome to be mitigated:

Brainstorming space

Bold Policy Mitigation

Sentence must begin with an action verb and the key stakeholder(s) responsible for carrying it out.

Activity 01:

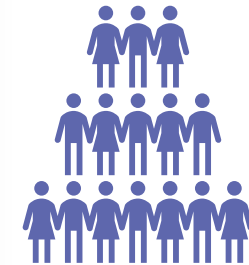
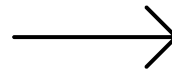
Enhance risk awareness by exploring the broad spectrum of risks



40 min

When you receive your risk card, plot it on the matrix.

How much do you know about how this risk is linked to Crisis Management in 2036?
What are the risk's potential impact for Crisis Management?



Activity 02, part 1:

Explore cascading impacts of and interconnections between crises

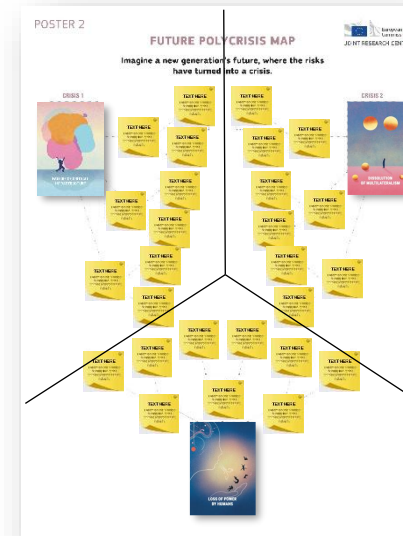
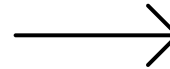
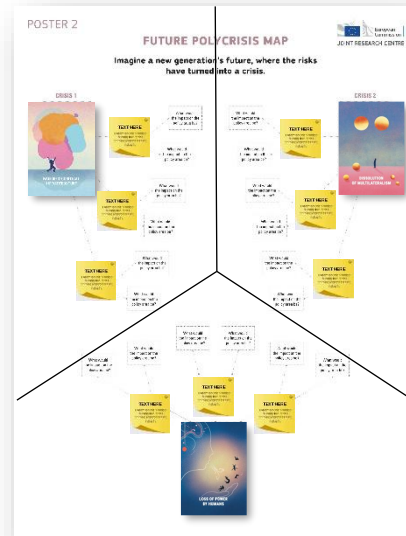
Imagine that the risk event has happened and turned into a crisis.
What has happened? Think about how the crisis might manifest itself.

What are three main big impacts (STEEP)? Only negative impacts.

How could these impacts manifest in Crisis Management in 2036?



30 min



Activity 02, part 2:

Explore cascading impacts of and interconnections between crises

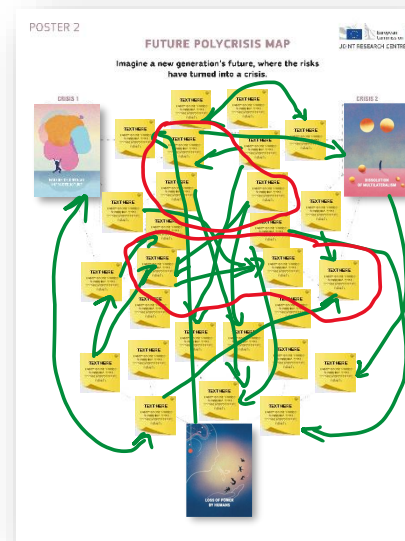


20 min

Let's put the subgroups' work together.

Now, let's identify links between all manifestations and impacts. **What influences what, in what direction? What augments what?**

Lastly, **vote on the most unexpected insights to you.**





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WRAP-UP & TAKEAWAYS

Plenary discussion:

Which was your most surprising
impact and why?

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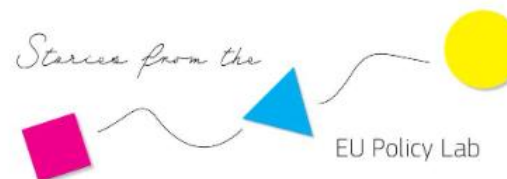
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