UK&Ireland
United Kingdom and Ireland Lakes Network

ANNUAL CONFERENCE

10th & 11th October 2023
Glasgow

Registration Now Open

Urgency, Innovation and Collaboration for Lakes, Lochs and Wetlands

UK & IRELAND LAKES NETWORK CONFERENCE 2023

Hosts

UK&Ireland United Kingdom and Ireland Lakes Network

SEVEN LOCHS wetland park

Supported by

GLASGOW CONVENTION BUREAU

NatureScot Green Infrastructure

Sponsors

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iolight

Global Nature Fund

11th October 2023

Global Nature Fund

A non-profit, independent international foundation for environment and nature.

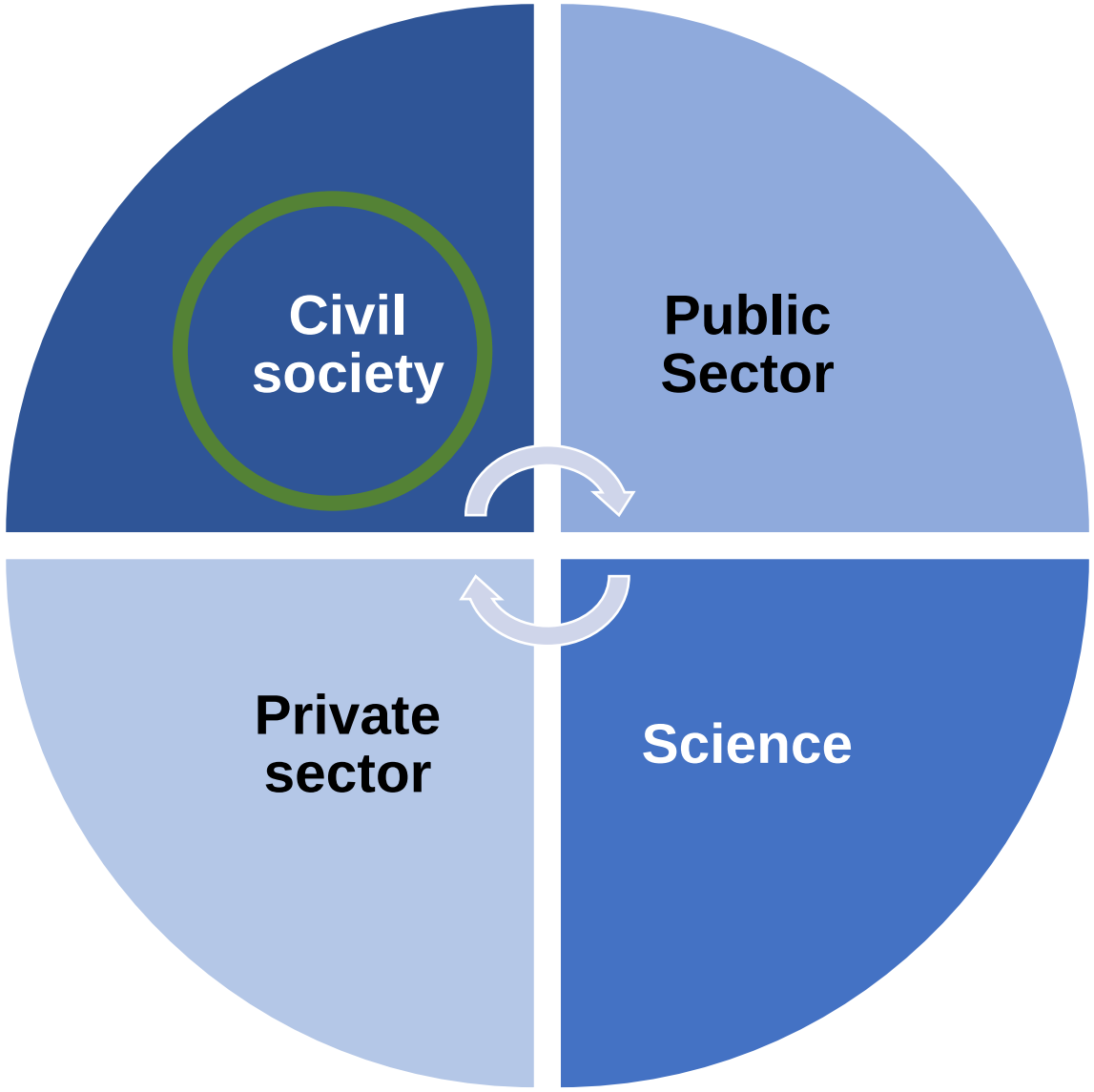
GNF's MISSION

GNF seeks to achieve its vision through partnerships...

... supporting the **protection of ecosystems**;
... promoting **sustainable livelihoods**;
... enabling **sustainable production**;
… nurturing a **sustainable future for youth**.

PRIORITY SDGs

PARTNERSHIPS

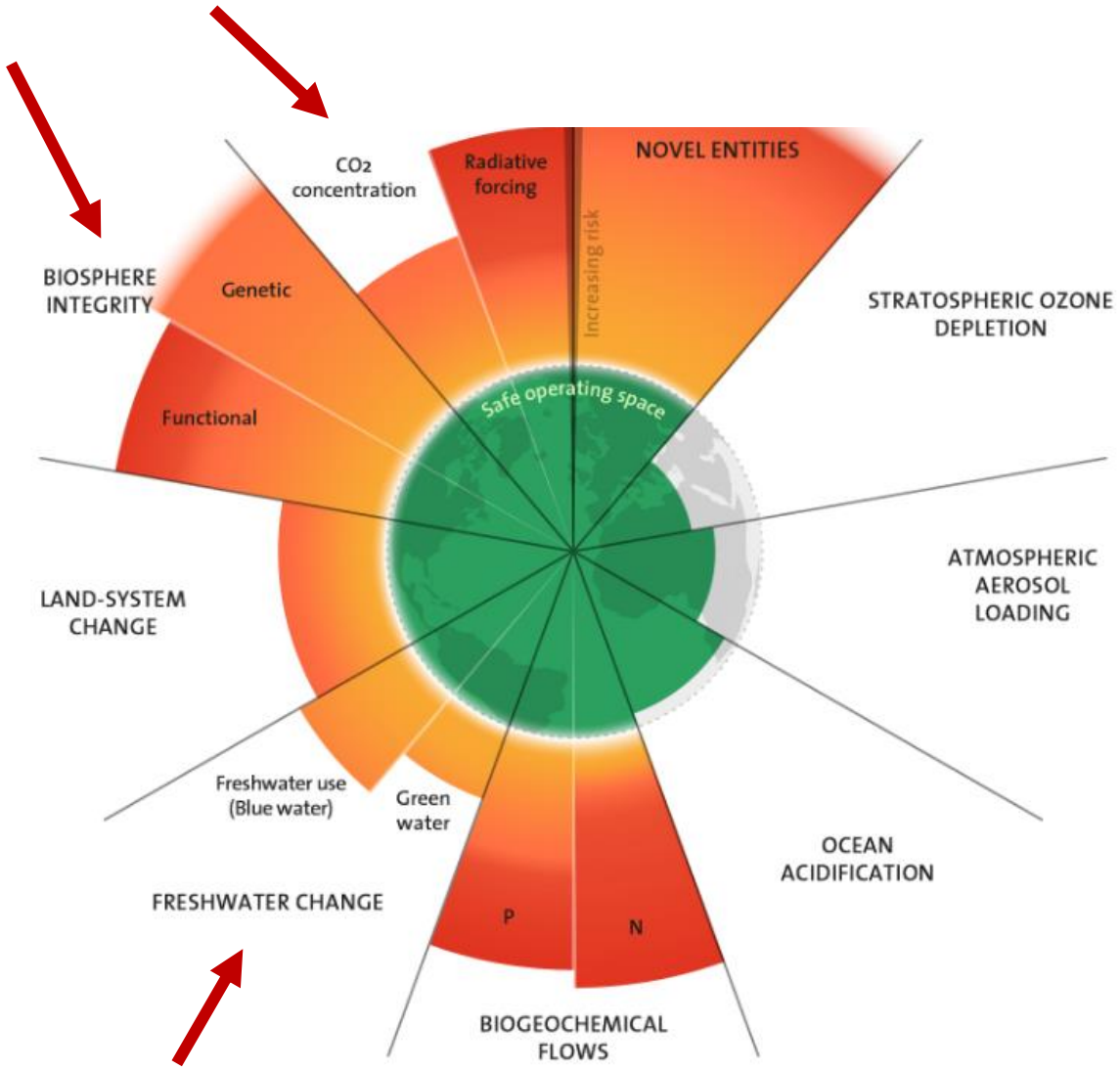


Global Nature Fund

The Anthropocene

Photo: U. Gattenlöhner

Planetary Boundaries



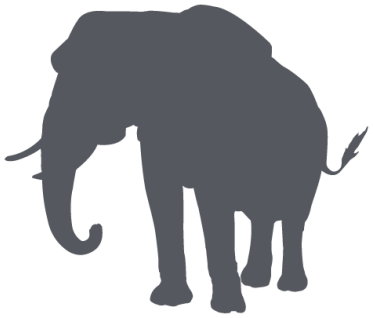
Loss of Vertebrae since 1970

(Data: WWF „Living Planet Index“ 2022)

– 38 %

– 83 %

– 36 %



Terrestrial

Freshwater

Fish/Marine

Average: All species 69% (Latin America 94%)

Global Nature Fund

Photo: U. Gattenlöhner

GNF
ACTIVITIES / PROJECTS

Photo: GNF

Fresh Water

Climate Change Mitigation

Biosphere Integrity

Livelihoods

GNF Projects

Global Nature Fund

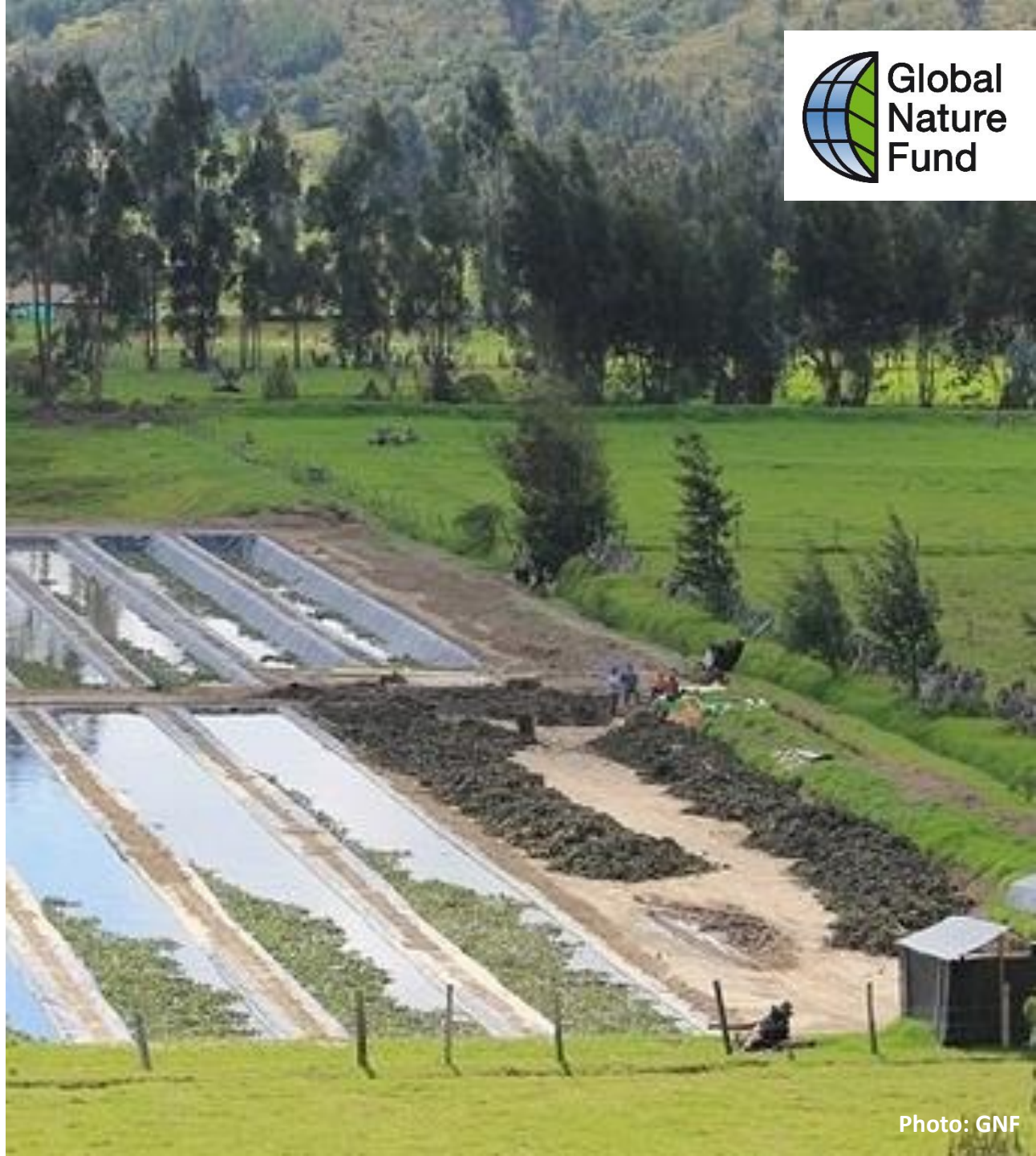
Photo: GNF

Protecting mangroves through sustainable aquaculture & reforestation

> 900.000 trees planted

Green Filters in Latin America

> 1,1 Mio. m³ sewage treated p.a.



Conservation of fish stocks at the world‘s lakes

> 5.000 fisherfolks supported

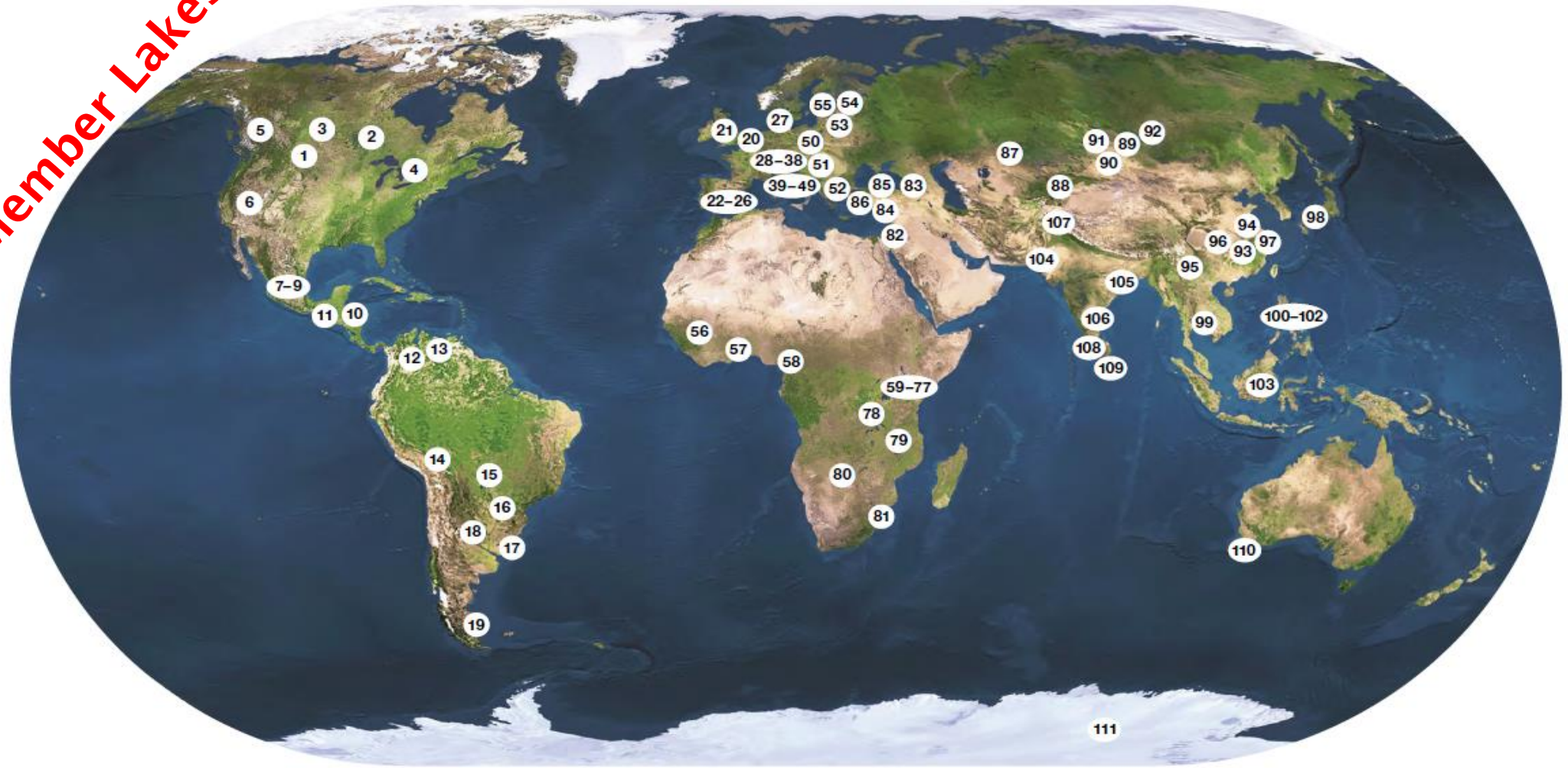
Improved hygiene and drinking water supply for schools in Africa

> 80 WASH & Drinking Water Projects


Living Lakes
International network for the protection
Lakes & Wetlands
Lebendige Seen
Deutschland
Photo: GNF

Members of the Living Lakes Network

115 Member Lakes



North America

1 Columbia River Wetlands; **Canada**
2 Lake Winnipeg; **Canada**
3 Athabasca River; **Canada***
4 Huron Lake; **Canada***
5 Skeena River; **Canada***
6 Mono Lake; **USA**
7 Lake Chapala; **Mexico**
8 Ignacio Allende Reservoir; **Mexico**
9 Laguna de Zapotlán; **Mexico**
10 Lake Amatitlán; **Guatemala**
11 Lake Atitlán; **Guatemala**

South America

12 Laguna de Fúquene; **Colombia**
13 Lake Tota; **Colombia**
14 Lake Titicaca; **Peru, Bolivia**
15 Pantanal Wetlands; **Brazil, Bolivia, Paraguay**
16 Lagunita Complex; **Paraguay**
17 Laguna de Rocha; **Uruguay**
18 Mar Chiquita; **Argentina**
19 Río Gallegos; **Argentina**

Europe

20 Norfolk & Suffolk Broads; **Great Britain**
21 Lake District; **Great Britain**
22 Lake Albufera; **Spain**
23 Delta de Llobregat; **Spain**
24 La Mancha Wetlands; **Spain**
25 La Nava; **Spain**
26 Salobrar de Campos; **Majorca, Spain**
27 Kolindsund Wetlands; **Denmark**
28 Lake Constance; **Germany, Switzerland, Austria**
29 Chiemsee; **Germany***
30 Lake Dümmer; **Germany***
31 Lusatian Lakeland; **Germany***
32 Mindelsee; **Germany***
33 Upper Swabian Lakes; **Germany***
34 Lake of Plau; **Germany***
35 Lake Schwerin; **Germany***
36 Lakes of Holstein Switzerland; **Germany***
37 Lake Stechlin; **Germany***
38 Lake Steinhude; **Germany***
39 Lake Trasimeno; **Italy**
40 Lake Albano; **Italy***
41 Lake Bolsena; **Italy***
42 Lake Bracciano; **Italy***
43 Colfiorito Wetland and Park; **Italy***
44 Lake Garda; **Italy***
45 Lago Maggiore; **Italy***
46 Lake Nemi; **Italy***
47 Lake Orta; **Italy***
48 Lake Piediluco; **Italy***
49 Lake Vico; **Italy***
50 Milicz Ponds; **Poland**
51 Lake Balaton; **Hungary**
52 Nestos Lakes and Lagoons; **Greece**
53 Labanoras Regional Park; **Lithuania**
54 Lake Peipsi; Estonia, **Russia**
55 Lake Võrtsjärv; **Estonia**

Africa

56 Lake Sonfon; **Sierra Leone**
57 Lake Nokoué; **Benin**
58 Lake Ossa; **Cameroon**
59 Lake Victoria; **Kenya, Tanzania, Uganda**
60 Lake Bogoria; **Kenya***
61 Lakes of Bugesera Region; **Burundi***
62 Bujagali Falls; **Uganda***
63 Lake Bunyonyi; **Uganda***
64 Lake Chala; **Kenya***
65 Lake Iherna; **Rwanda***
66 Lake Jipe; **Kenya, Tanzania***
67 Lake Kanyaboli; **Kenya***
68 Lake Katwe; **Uganda***
69 Lake Kivu; **Democratic Republic of the Congo, Rwanda***
70 Lake Kyoga; **Uganda***
71 Mau Forest; **Kenya***
72 Lake Nabugabo; **Uganda***
73 Lake Naivasha; **Kenya***
74 Lake Ol Bolossat; **Kenya***
75 Lake Rwihinda; **Burundi***
76 Shompole Wetland; **Kenya, Tanzania***
77 Lake Wamala; **Uganda***
78 Lake Tanganyika; **Burundi, Democratic Republic of the Congo, Tanzania, Zambia**
79 Lake Malawi; **Tanzania, Malawi, Mozambique**
80 Okavango Delta; **Botswana**
81 Lake St. Lucia; **South Africa**

Asia

82 Dead Sea; **Israel, Jordan, Palestine**
83 Lake Paliastomi; **Georgia**
84 Lake Eğirdir, **Turkey**
85 Lake Sapanca; **Turkey**
86 Lake Uluabat; **Turkey**
87 Lake Tengiz; **Kazakhstan**
88 Lake Issyk-Kul; **Kyrgyzstan**
89 Lake Hovsgol; **Mongolia**
90 Lakes Ulaan, Airag, Khyargas and Angir-Nuden Mondoohei; **Mongolia**
91 Lake Uvs; **Mongolia**
92 Lake Baikal; **Russia**
93 Lake Poyang; **China***
94 Lake Chao; **China***
95 Lake Dian; **China***
96 Lake Dongting; **China***
97 Lake Tai; **China***
98 Lake Biwa; **Japan**
99 Lake Tonle Sap; **Cambodia**
100 Laguna de Bay; **Philippines**
101 Lake Sampaloc; **Philippines**
102 Lake Taal; **Philippines**
103 Jempang Lake & Mahakam Wetlands; **Indonesia**
104 Deh Akro Wetlands; **Pakistan**
105 Lake Chilika; **India**
106 Lake Pulicat; **India**
107 Lake Wular; **India**
108 Lake Bolgoda; **Sri Lanka**
109 Lake Maduganga and Lake Madampe; **Sri Lanka**

Australia / Oceania

110 Wilson Inlet; **South W t Australia**

Antarctica

111 Lake Vostok; **Antarctica**

*National member of a national or multinational Living Lakes Network.

ELLA

European Living Lakes Association

Constituting a European Living Lakes Association (ELLA) empowering Civil Society Organizations to enhance and support the protection and sustainable use of aquatic ecosystems and their related biodiversity

ELLA eV in May 2022

FUNDACIÓN GLOBAL NATURE

Bodensee Stiftung

LAKE BALATON DEVELOPMENT COORDINATION AGENCY

PEIPSI CTC

ELLA Association – Members (10):

- Global Nature Fund (GNF), Germany
- Lake Constance Foundation, Germany
- German Environment Action, Germany
- Fundación Global Nature (FGN), Spain
- Lake Balaton Developement Cooperation Agency, Hungary
- Accociation of Civil Organisations at Lake Balaton
- Peipsi Center for Transboundary Cooperation (CTC), Estonia
- Stowarzyenie Ekologiczne „ETNA“, Poland
- Legambiente, Italy
- Nature Research Society (Doğa Araştırmaları Derneği), Turkey

ELLA-Objectives

Nature conservation and environmental protection

ELLA-Objectives

Rural development and sustainable agriculture

ELLA-Objectives

Project cooperation

ELLA Objectives

Promotion of science and research

Membership

Members of the association can be all legal entities, particularly non-governmental organizations working on the protection of lakes and wetlands in Europe.

Flashlight study "Lakes and Climate Change“

Overview of current research results on water bodies and climate change in Germany

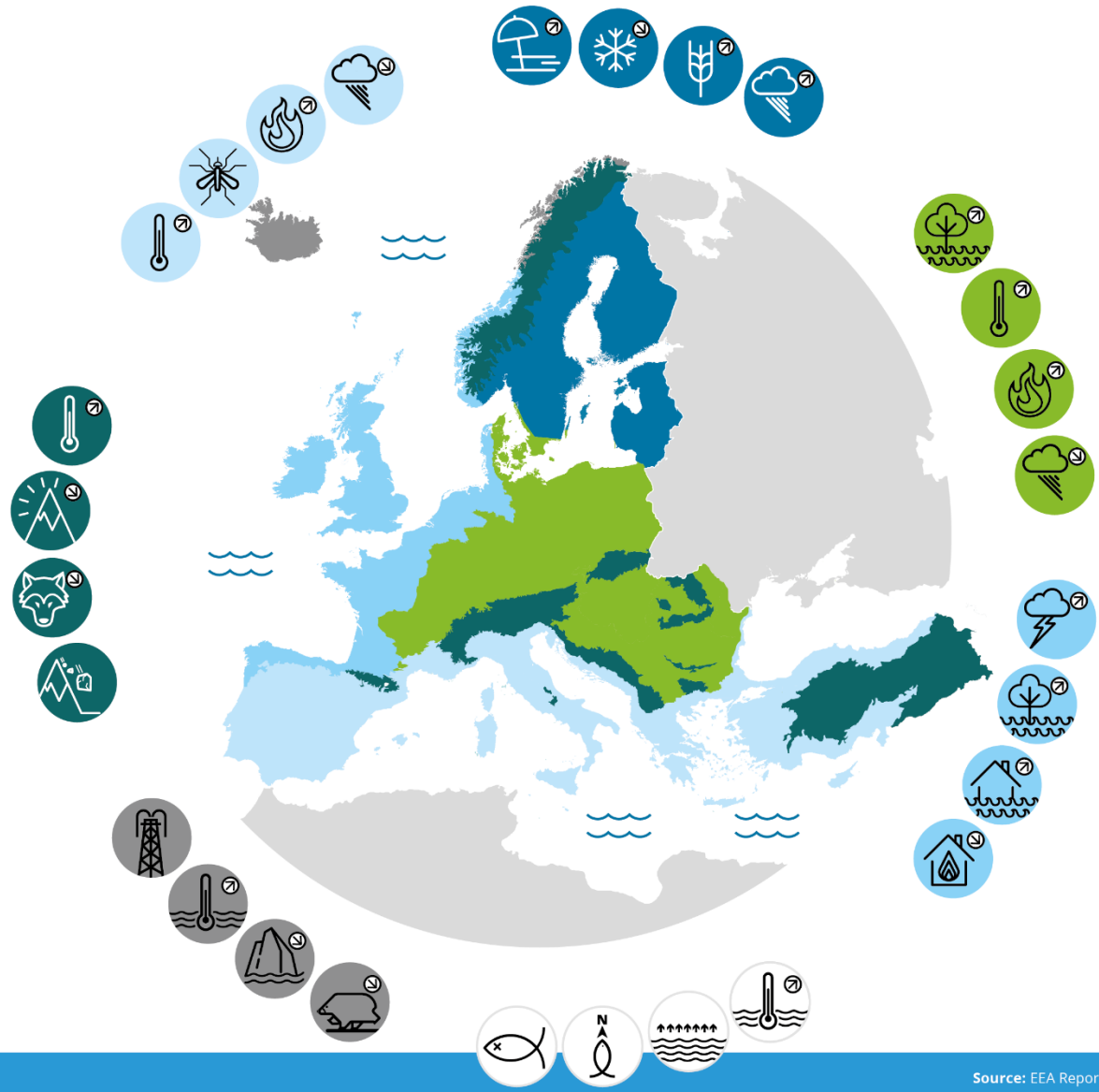
Supporters:

Bundesministerium für Umwelt, Naturschutz und nukleare Sicherheit

BfN Bundesamt für Naturschutz

Climate change impacts in Europe's regions

Climate change is projected to impact the availability of water in Europe, putting additional pressure on southern regions already facing water stress. Other parts of Europe are expected to face more frequent flooding events, while low-lying regions are at risk from storm surges and sea level rise.



Mediterranean region

Large increase in heat extremes
Decrease in precipitation and river flow
Increasing risk of droughts
Increasing risk of biodiversity loss
Increasing risk of forest fires
Increased competition between different water users
Increasing water demand for agriculture
Decrease in crop yields
Increasing risks for livestock production
Increase in mortality from heat waves
Expansion of habitats for southern disease vectors
Decreasing potential for energy production
Increase in energy demand for cooling
Decrease in summer tourism and potential increase in other seasons
Increase in multiple climatic hazards
Most economic sectors negatively affected
High vulnerability to spillover effects of climate change from outside Europe

Boreal region

Increase in heavy precipitation events
Decrease in snow, lake and river ice cover
Increase in precipitation and river flows
Increasing potential for forest growth and increasing risk of forest pests
Increasing damage risk from winter storms
Increase in crop yields
Decrease in energy demand for heating
Increase in hydropower potential
Increase in summer tourism

Continental region

Increase in heat extremes
Decrease in summer precipitation
Increasing risk of river floods
Increasing risk of forest fires
Decrease in economic value of forests
Increase in energy demand for cooling

Atlantic region

Increase in heavy precipitation events
Increase in river flow
Increasing risk of river and coastal flooding
Increasing damage risk from winter storms
Decrease in energy demand for heating
Increase in multiple climatic hazards

Coastal zones and regional seas

Sea level rise
Increase in sea surface temperatures
Increase in ocean acidity
Northward migration of marine species
Risks and some opportunities for fisheries
Changes in phytoplankton communities
Increasing number of marine dead zones
Increasing risk of water-borne diseases

Arctic region

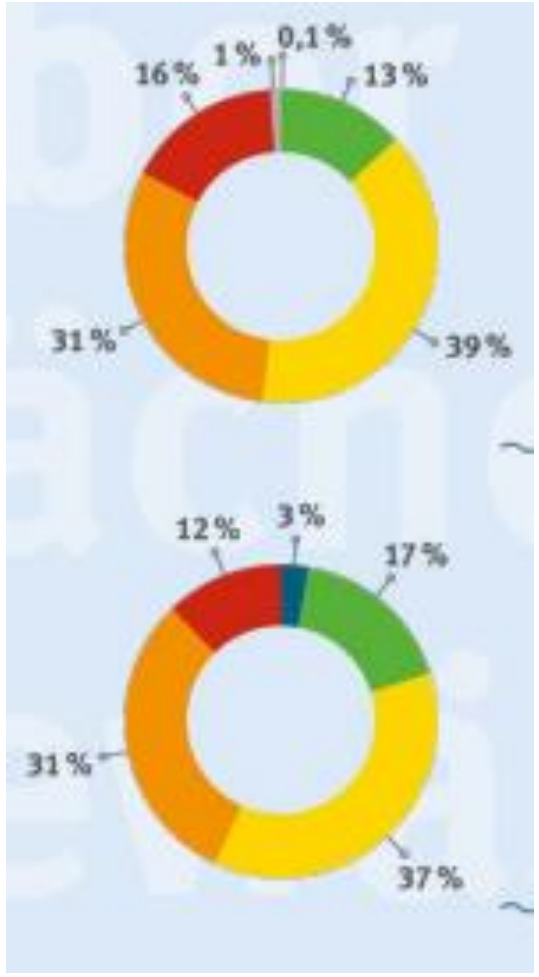
Temperature rise much larger than global average
Decrease in Arctic sea ice coverage
Decrease in Greenland ice sheet
Decrease in permafrost areas
Increasing risk of biodiversity loss
Some new opportunities for the exploitation of natural resources and for sea transportation
Risks to the livelihoods of indigenous peoples

Mountain regions

Temperature rise larger than European average
Decrease in glacier extent and volume
Upward shift of plant and animal species
High risk of species extinctions
Increasing risk of forest pests
Increasing risk from rock falls and landslides
Changes in hydropower potential
Decrease in ski tourism

Source: EEA Report No 01/2017 — *Climate change, impacts and vulnerability in Europe 2016.*

Global Nature Fund



Lakes

Rivers

Many water bodies in Germany are not in good ecological condition

Source: BMUV/UBA 2022. The Water Framework Directive - Water Bodies in Germany 2021. Progress and Challenges (p. 57).

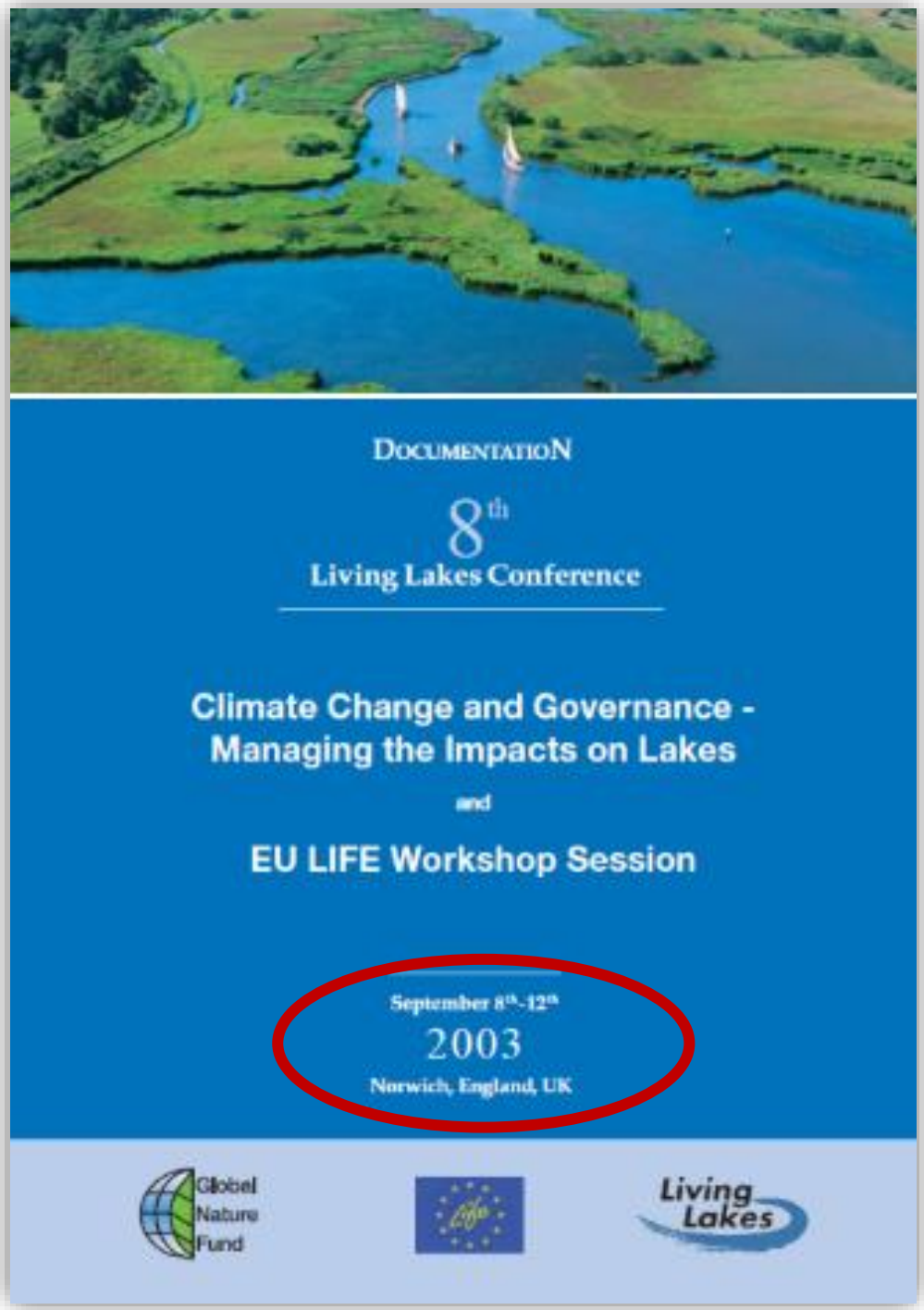
Climate Change effects on lakes

Global Nature Fund (GNF) &
Tyndall Centre for Climate Change Research

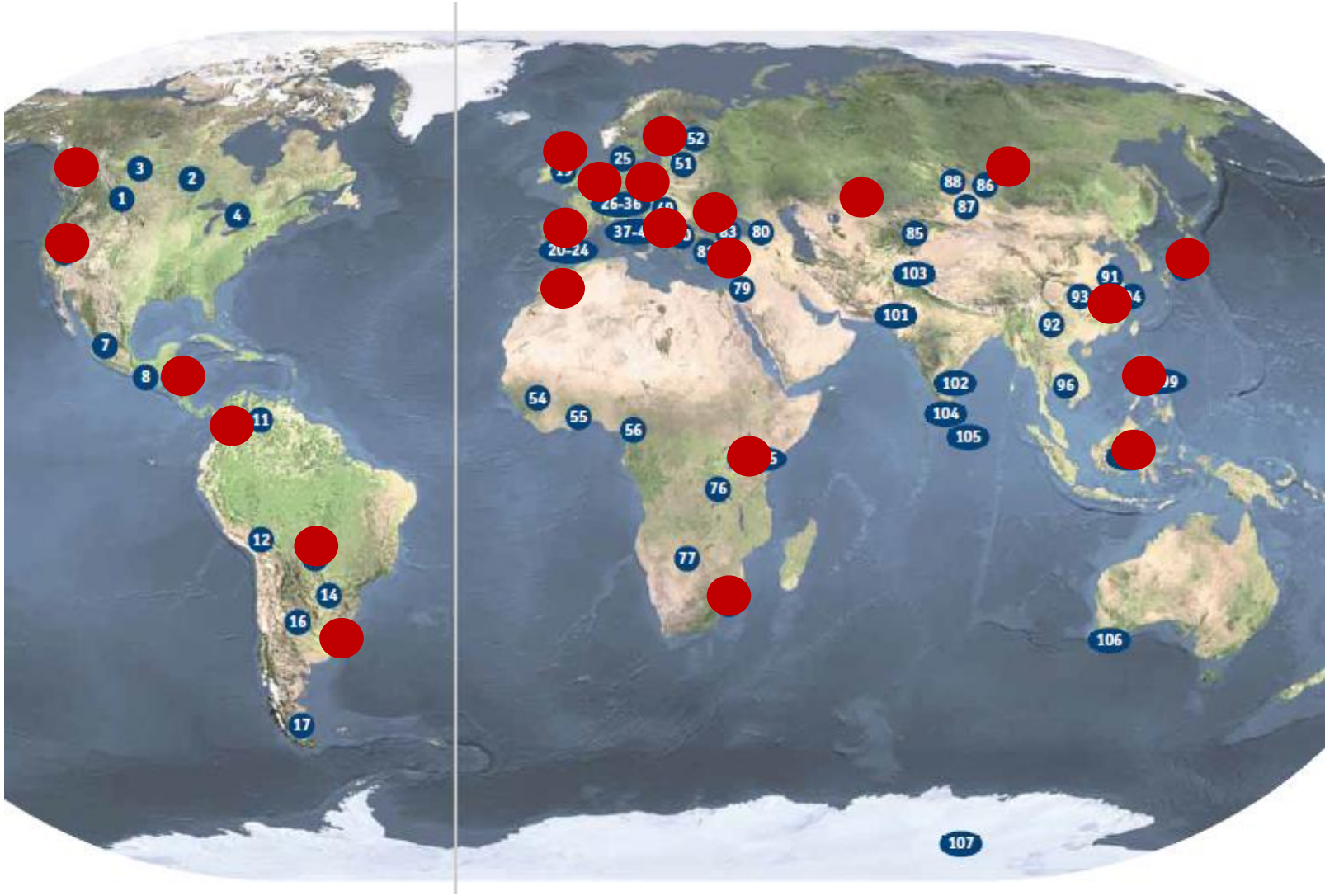
Scenarios for 23 lakes until 2080

Effects on
=> Average temperatures
=> Precipitation (winter & summer)

Emissions scenario SRES A2, 9 models (IPCC)



1. **The Broads**, UK
2. **Lake Constance,** Germany, Austria, Switzerland
3. **Lake La Nava**, Spain
4. **Milicz Ponds**, Poland
5. **Nestos Lakes,** Greece
6. **Uluabat Lake,** Turkey
7. **Lake Larache,** Morocco
8. **Lake Victoria,** Uganda, Kenya, Tanzania
9. **Lake St Lucia**, South Africa
10. **The Dead Sea,** Israel, Jordan, Palestine
11. **Lakes Peipsi and Vörtsjärv,** Estonia, Russia
12. **Lake Tengiz,** Kazakhstan
13. **Lake Baikal**, Russia
14. **Poyang Lake**, China
15. **Lake Biwa**, Japan
16. **Mahakam Lakes**, Indonesia
17. **Laguna de Bay,** The Philippines
18. **Columbia River Wetlands,** Canada
19. **Mono Lake**, USA
20. **Laguna Chapala,** Mexico
21. **Laguna Fuquene**, Columbia
22. **Pantanal Wetland,** Brazil, Bolivia, Paraguay
23. **Laguna Mar Chiquita,** Argentina



Effects: Lake Constance - **Winter**

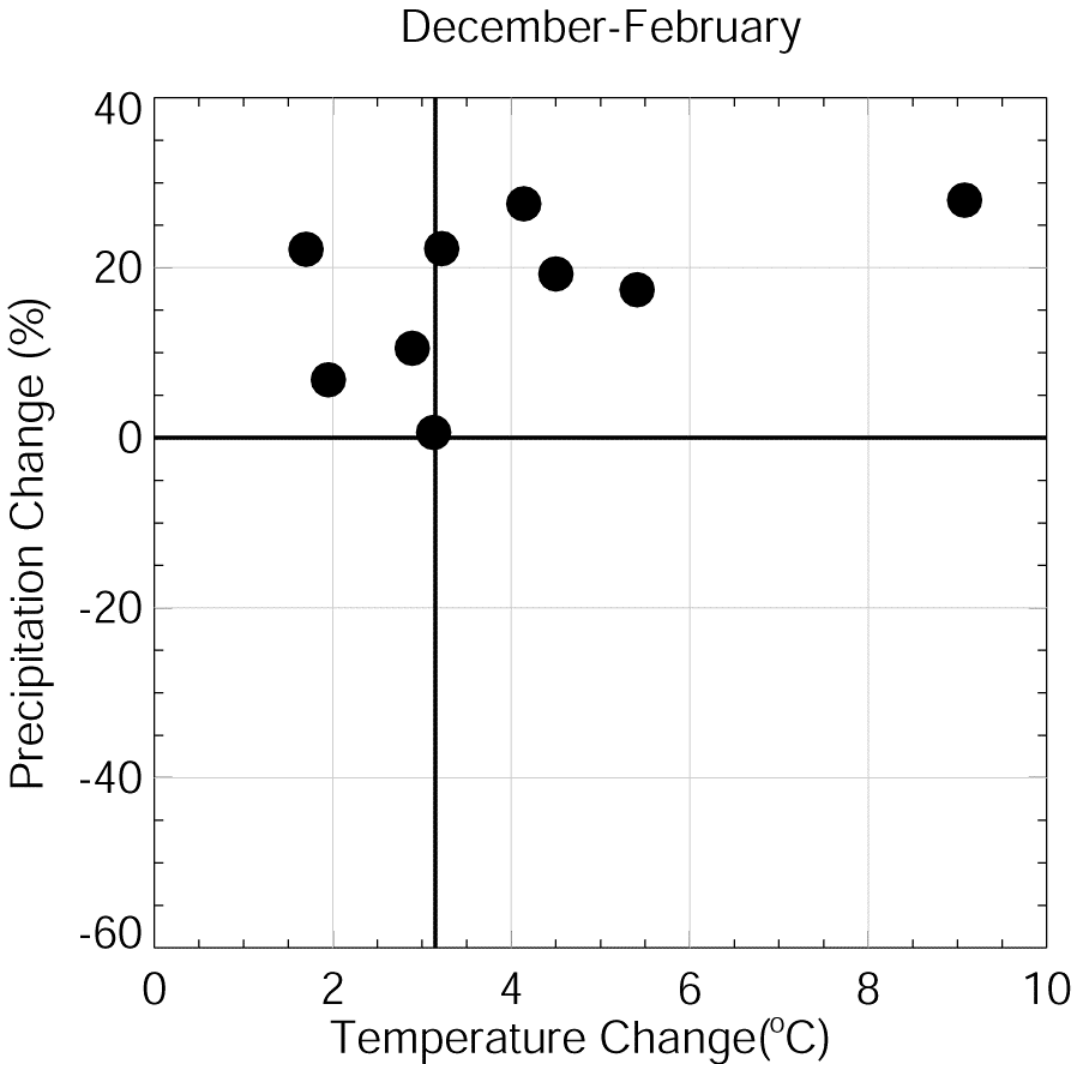
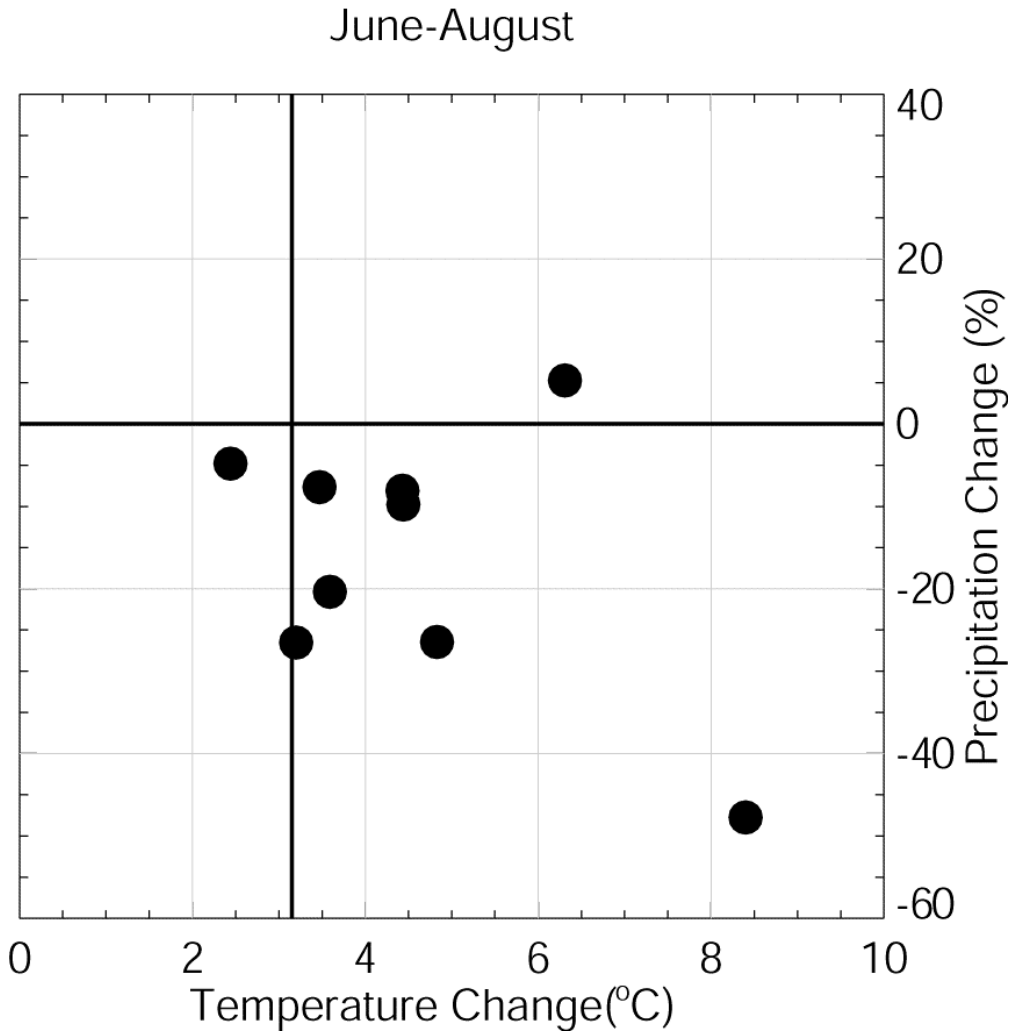


Photo: Udo Gattenlöhner

Effects: Lake Constance - **Summer**

Photo: Udo Gattenlöhner



Flashlight Study

Lakes and Climate Change in Europe

Global Nature Fund (GNF) & ELLA

Expected effects on all lakes...

- Significantly **higher air and water temperatures** (> 2°C)

Photo: Udo Gattenlöhner

Expected effects on all lakes...

- Significantly **higher air and water temperatures** (> 2°C)
- **Temperatures in summer** will rise more than global mean temperature

Photo: Udo Gattenlöhner

Expected effects on all lakes...

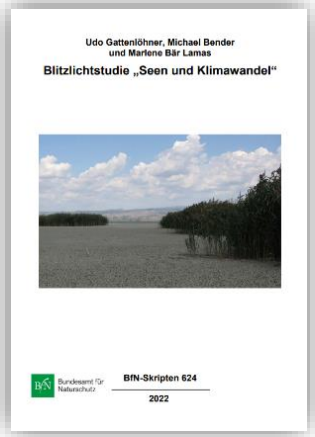
- Significantly **higher air and water temperatures** (> 2°C)
- **Temperatures in summer** will rise more than global mean temperature
- **Precipitation** shifts from **summer to winter**

Photo: Udo Gattenlöhner

Expected effects on all lakes...

- Significantly **higher air and water temperatures** (> 2°C)
- **Temperatures in summer** will rise more than global mean temperature
- **Precipitation** shifts from **summer to winter**
- **Earlier snow melt**

Photo: Udo Gattenlöhner

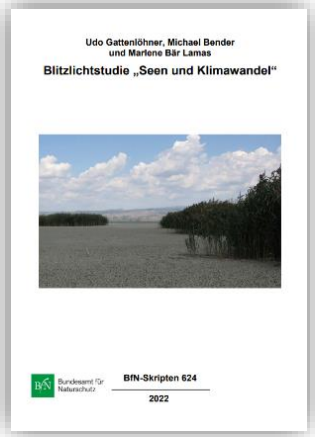


Brief summary of the studies

- Lakes are already reacting to global warming.
  => Lake temperatures rise more strongly than air temperatures

Global Nature Fund

Photo: Udo Gattenlöhner

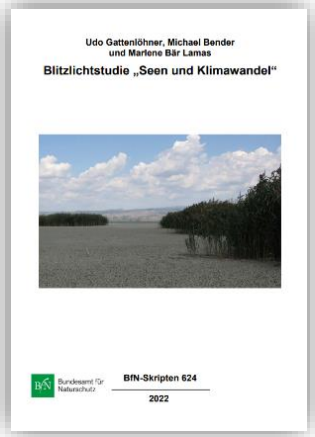


Brief summary of the studies

- Lakes are already reacting to global warming.
  => Lake temperatures rise more strongly than air temperatures
- Eutrophication risk increases
  => stratified lakes mix less frequently
  => heavier rainfalls => nutrient inputs

Photo: Albrecht Trautmann

Global Nature Fund



Brief summary of the studies

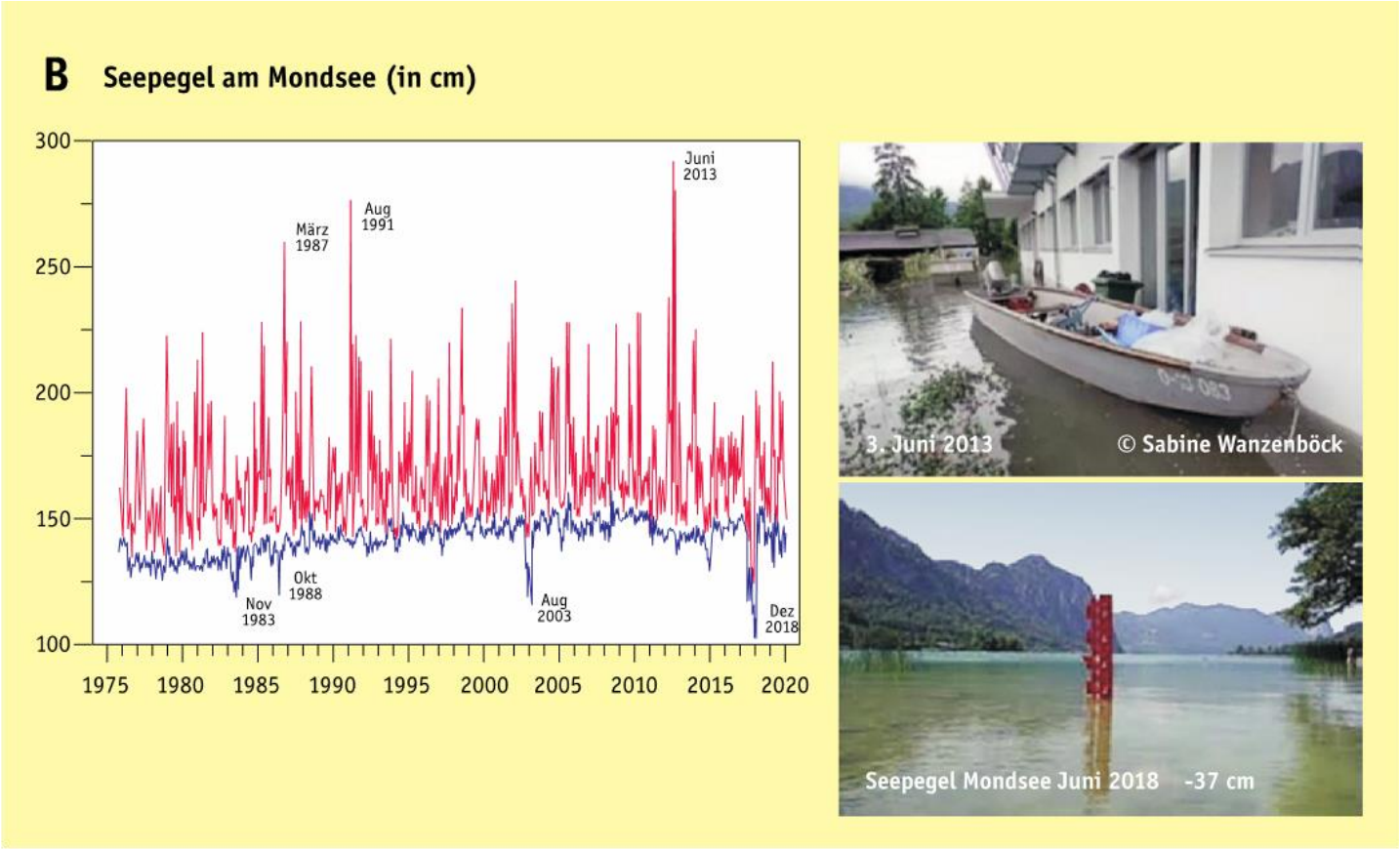
- Lakes are already reacting to global warming.
  => Lake temperatures rise more strongly than air temperatures
- Eutrophication risk increases
  => stratified lakes mix less frequently
  => heavier rainfalls => nutrient inputs
- Further use (e.g. cooling water) and neo-biota lead to "stress".

Global Nature Fund

Photo: Udo Gattenlöhner

Impacts on Ecological Stability

- Increase of air and water temperature
- Decrease in winter ice cover
- Longer stratification periods
- Increase in and earlier onset of (toxic) algal blooms
- Oxygen depletion
- Sediment and nutrient runoff
- Extreme water level fluctuations

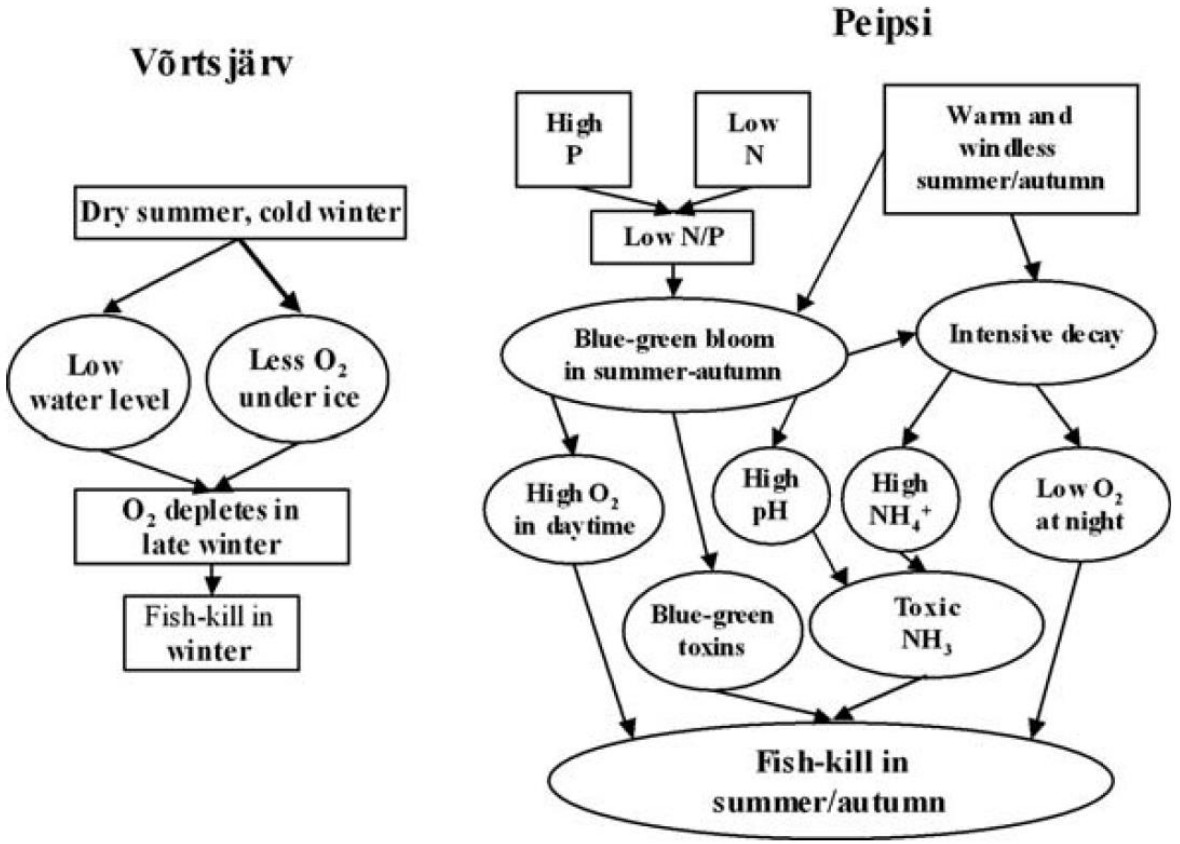


Maximum and minimum monthly water level at Mondsee (Austria) from 1976 to 2020 (left) as well as floods in 2013 and water level in 2018 (right) © Martin T. Dokulil

Impacts on Biodiversity

- Changes in community composition of fresh-whater species
- Increase in fish kills
- Loss of feeding, breeding and migratory habitats

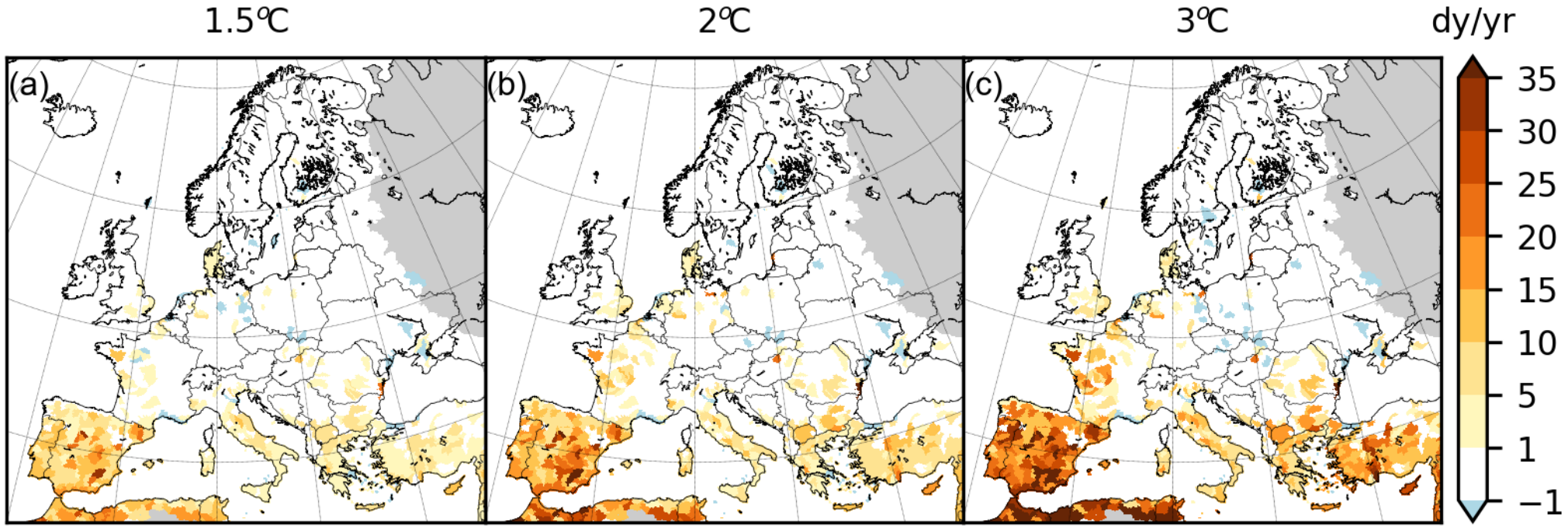
Dried bed of Lake Velence, Hungary (August 2022)
Picture © Anna Szilagyi



Schematic explanation of causes of fish kills in lakes Peipsi and Võrtsjärv © Peeter Nõges and Tiina Nõges

Impacts on Environmental Security

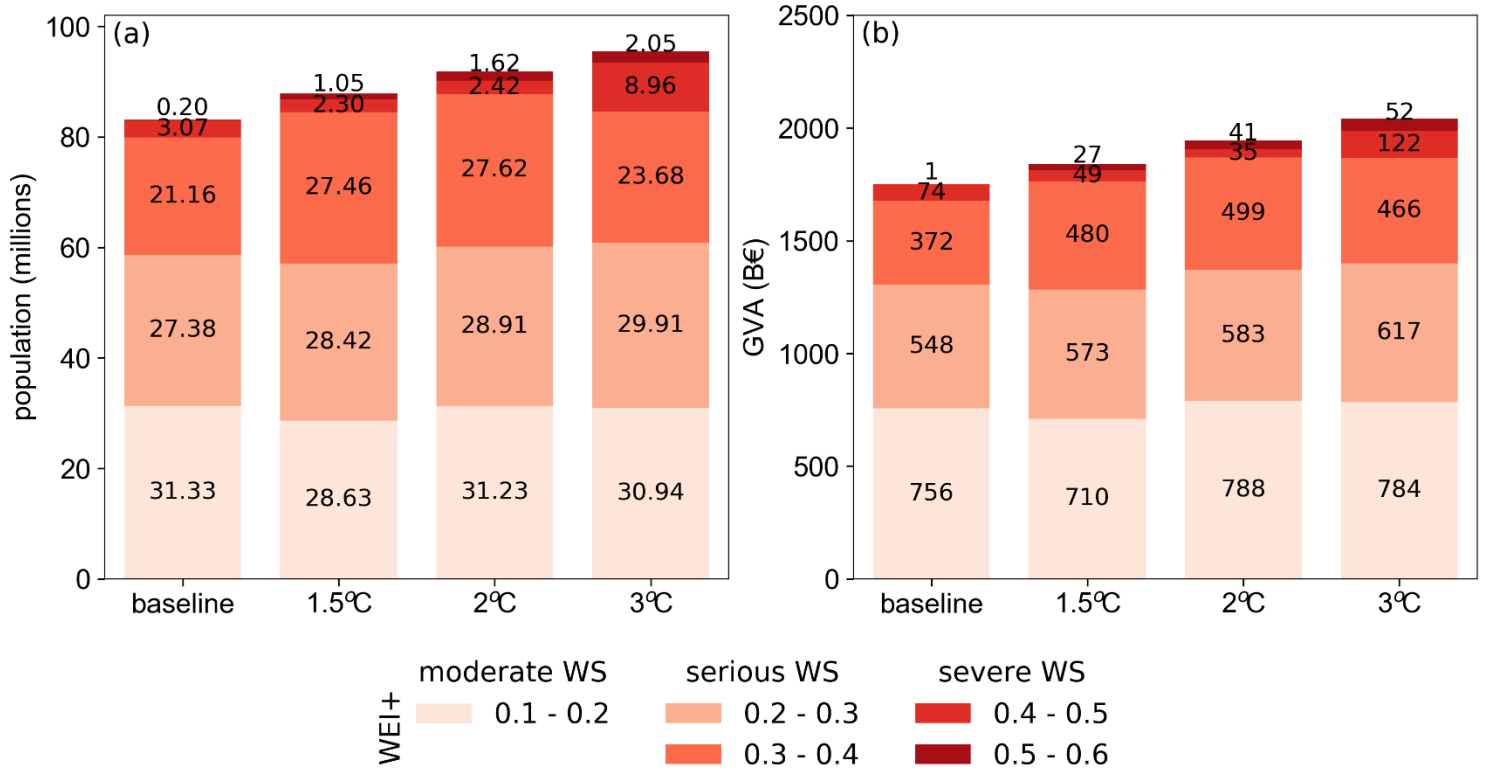
- Variation in precipitation patterns and extreme weather events
- Increase in heatwaves, droughts, forest fires, (flash) floods
- Increase in water scarcity, challenges for water resource allocation



Projected change in water scarcity days in a year compared with present day for a global temperature increase of (a) 1.5°C, (b) 2°C, and (c) 3°C. Source: Technical Report for the PESETA IV Project.

Socio-economic Impacts

- Agricultural sector most vulnerable to climate risk
- Threats for sustainable growth in aquaculture and fisheries
- Impact on tourism and infrastructure
- Risks for human health and productivity
- Increase of climate migration



Projected number of (a) people living and (b) economic activity exposed to different gradations of water scarcity (WS) in the EU + UK solely due to climate change. Source: Technical Report for the PESETA IV Project.

Summary: Recommendations

- Reduce nutrient inputs
- Avoidance of pollutant inputs
- Reduction of CO_2 and methane emissions => i.e. Paludiculture
- Renaturation: Establish buffer zones, riparian strips and shallow water zones
- Control invasive species
- Extremely restrained water use

Publications for download

https://www.globalnature.org/en/home/publications/living-lakes---water

Project Examples

- **ESA Lakes Climate Change Initiative Project** (Lakes-CCI)
- **ESPON LAKES** – Targeted territorial analysis of spatial progress and inte-grated development opportunities of large lakes in Europe
- **TRIAGE** – Trophic state Interactions with drivers of Aquatic greenhouse Gas Emissions
- **BINGO** – Bringing INnovation to onGOing water management – A better future under climate change
- **MAR2PROTECT** – Protecting groundwater from climate and global change effects

https://www.globalnature.org/en/home/publications/living-lakes---water

Funding Schemes

- **EU LIFE Programme**
  - Circular Economy and Quality of Life
  - Nature & Biodiversity – Standard Action Projects
  - Climate Change Mitigation and Adaptation

- **Interreg Programmes**

- **Horizon Programme**
  - Water4All
  - Climate, Energy and Mobility
  - Food, Bioeconomy, Natural Resources, Agriculture and Environment

https://www.globalnature.org/en/home/publications/living-lakes---water

Publications for download

Link: https://www.globalnature.org/en/flash-light-study-lakes-and-climate-change

Link: https://www.globalnature.org/en/home/publications/living-lakes---water

Contact

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