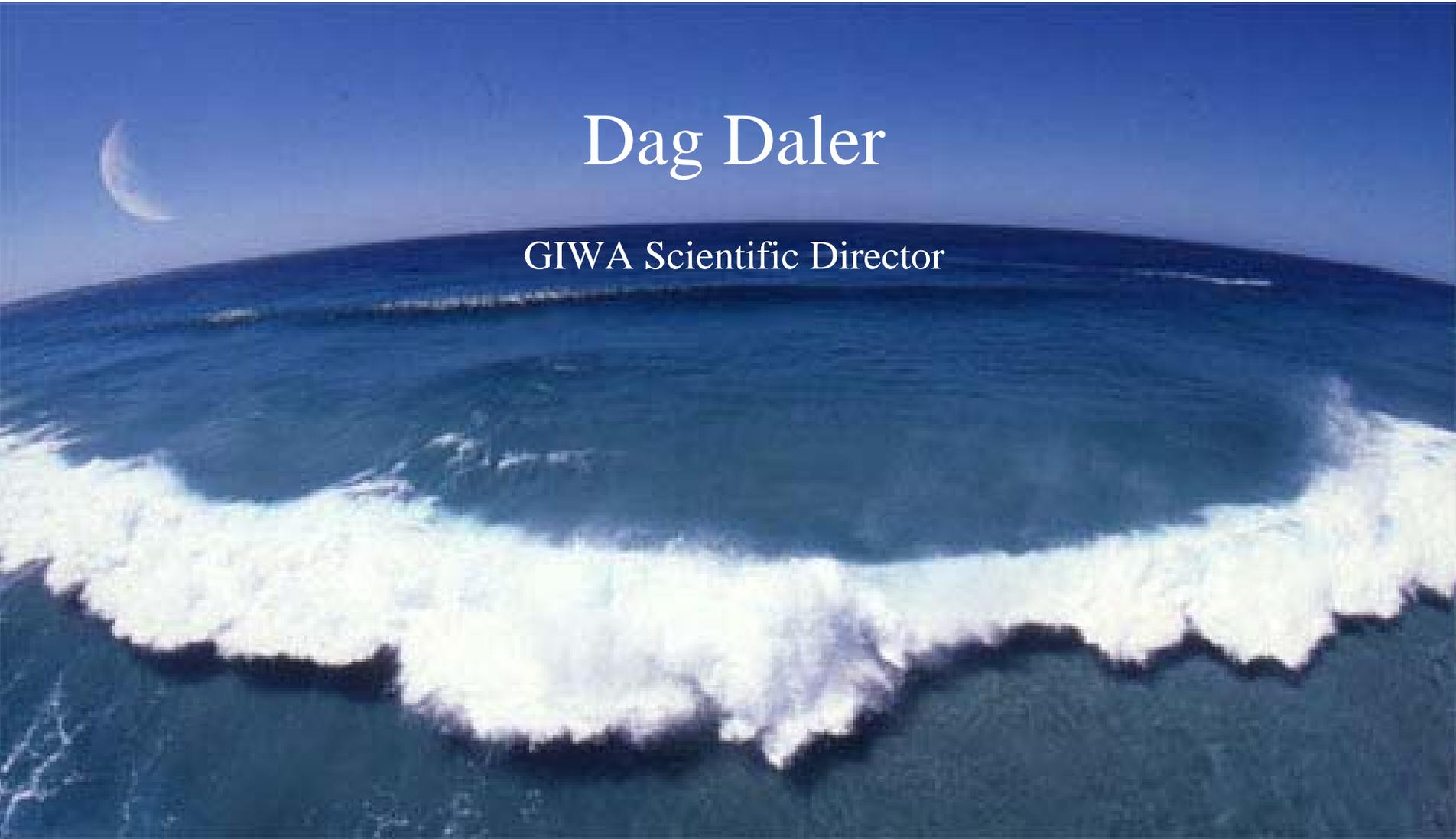




Water for the World: Space solutions for Water
Gratz, 13 September 2004

Dag Daler

GIWA Scientific Director





Global International Waters Assessment



Water is life – the ecosystem approach



River basins and coasts – from the mountains to the sea



Promoting Sustainable Use of Transboundary River Basins and Seas:

Bridging Science and Technology



Water management challenges no 1.

Natural variability in water availability:

- in space (desserts and rainforests)
- in time (floods and draughts)



Water management challenges no 2.

Impact from human activities :

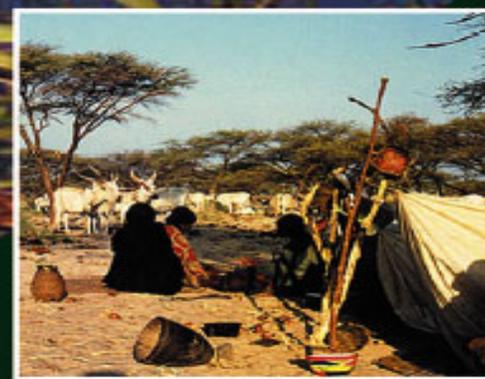
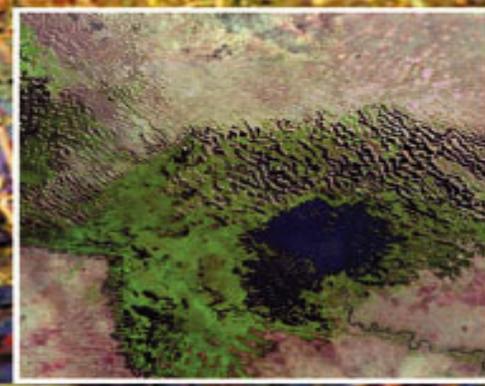
- on water quality (pollutants, toxic chemicals, excess nutrients from agriculture and settlements/sewages)
- on water quantity (over-extractions for irrigation and other human use)
- on aquatic ecosystems (habitat destruction and overexploitation of living resources)



Water management challenges no 3.

Impact from the Global Climate Change:

- changes in the hydrological cycle (more frequent extreme events)
- melt down of the arctic ice-cap
- reduced glaciers in the high mountains



Lake Chad



Lake Chad.

For the water losses:

- 40% is accounted for due to variability in precipitation; both natural variability and climate change induced reductions)
- 60 % is accounted for due to human use (over-extraction for irrigation and other use by society)



Aral Sea.

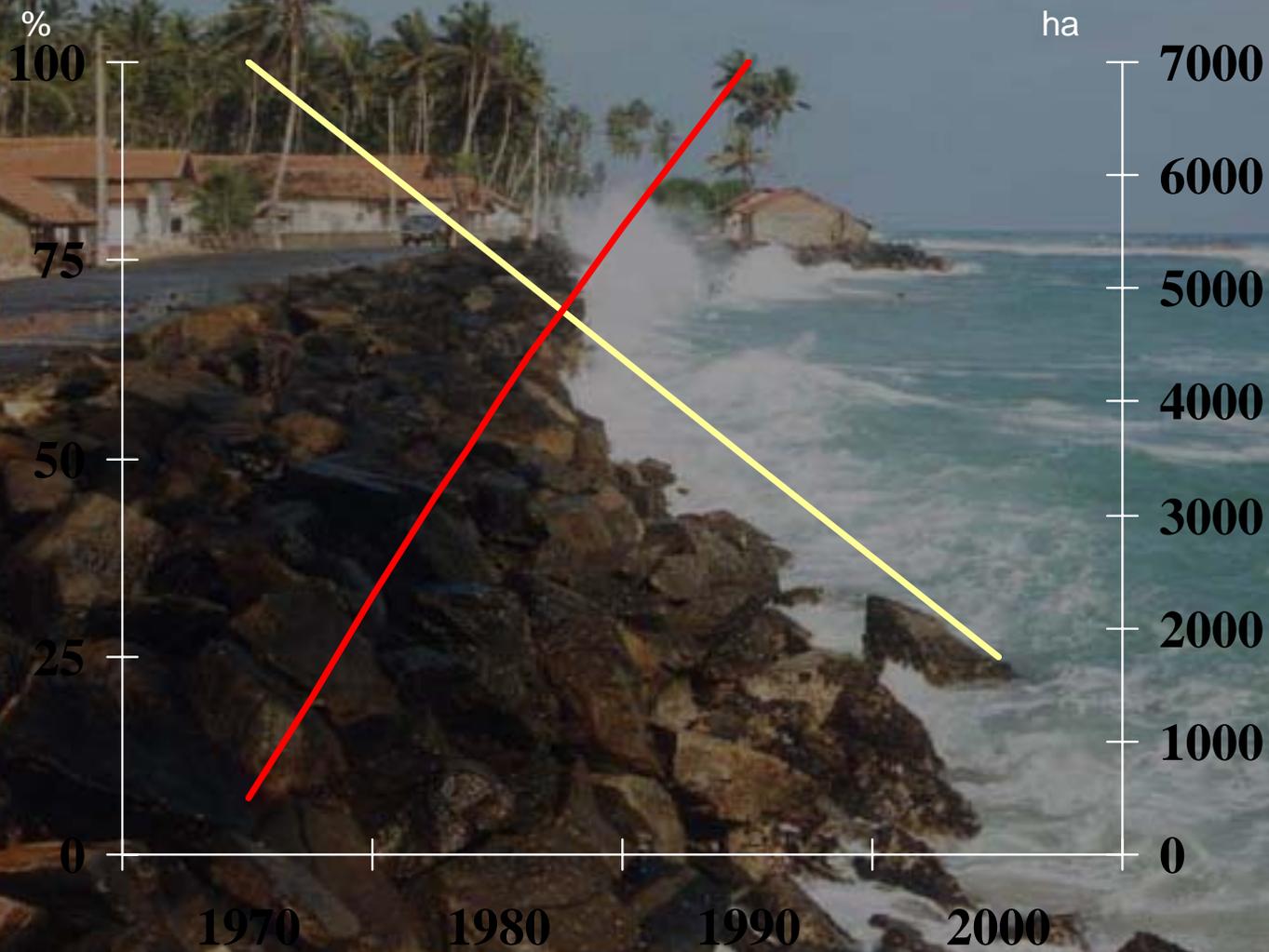
The Aral Sea is drying out due to large scale agriculture development in the basin based on irrigation:

- A huge loss of biodiversity and commercial fishing in the Sea (fish landings used to be 50.000 – 60.000 metric tonnes)
- Dramatic negative consequences for hundred thousands of people lining in the sea area (65.000 people used to be employed in the fishery sector alone)

Niger Delta

— Sediment transport

— Riverbank erosion





- The main challenge is to integrate socio-economic and environmental decision making.
- There is a gap between science and society that has to be bridged if sustainable use of water resources shall emerge.
- Economic returns from investments in environmental infrastructure can be significant due to improvements in public health, ecosystem productivity and damages that are avoided.
- A better understanding of the driving forces in society that lead to environmental pressure is required.
- Water resource management and planning should cover all activities in the drainage basin, land-use practices, agriculture, water treatment facilities, waste disposal sites, industrial developments etc.





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- Many water management challenges are transboundary and require international cooperation.
- There is a huge gap in knowledge concerning the environmental degradation of the water bodies and the link to human societies.
- Public awareness is important. Without public awareness commercial interests will often take priority over environmental considerations.

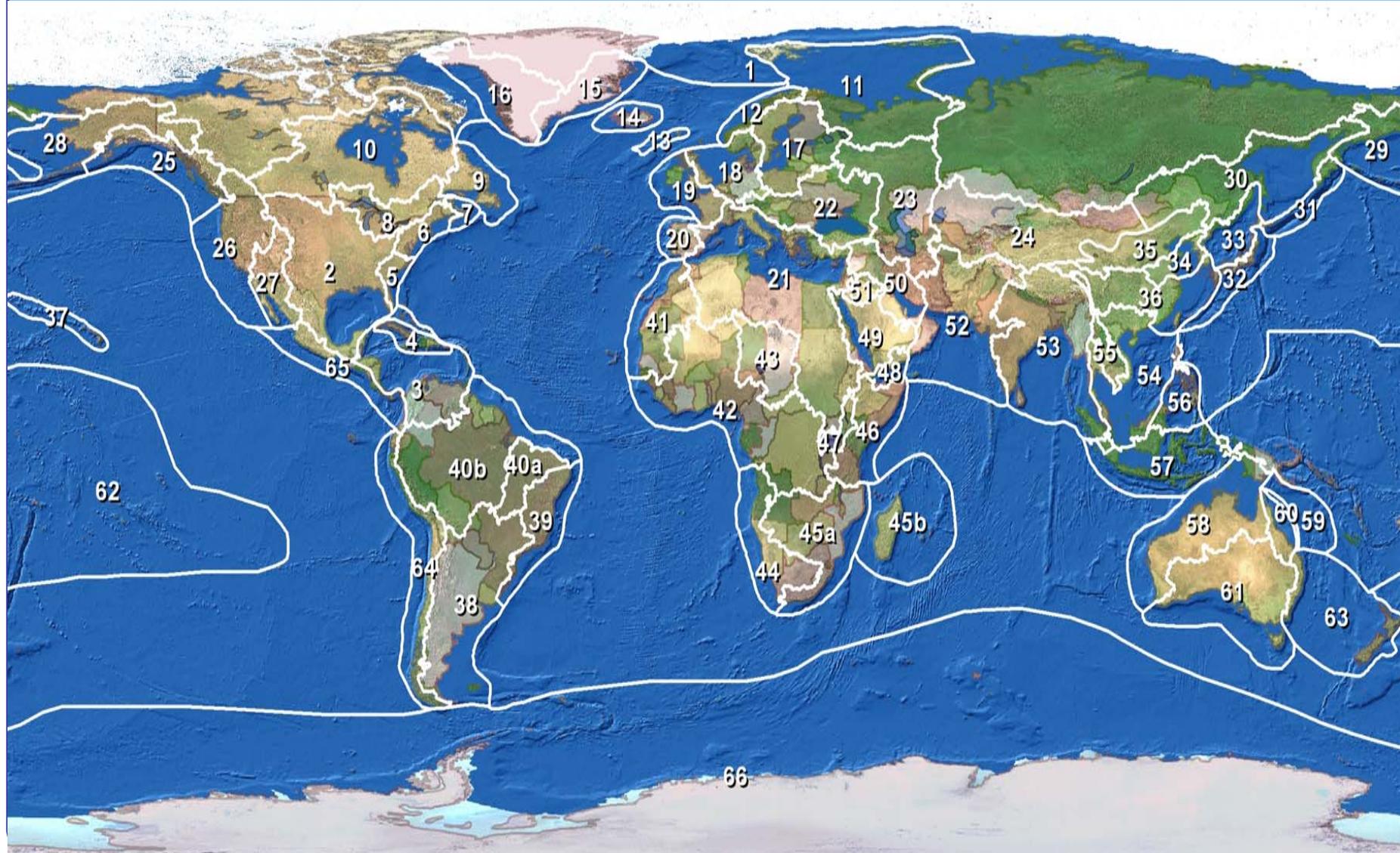


GIWA – a holistic approach

- The water, freshwaters and coasts – rivers and lakes.
- Habitats
- The living resources and associated biodiversity
- The human dimensions: Anthropogenic influences and causes of environmental problems
- Environmental impact and societal root causes



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GIWA 5 Concerns (22 Issues)

- **Freshwater shortage** (Reduction of stream flow; Lowering of water table and; Pollution of existing water supplies)
- **Pollution** (Microbiological pollution; Eutrophication; Chemical pollution; Suspended solids; Solid waste; Thermal pollution; Radionuclides; Spills)
- **Habitat and community modification** (Loss of ecosystems or ecotones; Modification of ecosystems or ecotones)
- **Unsustainable exploitation of fisheries and other living resources** (Inappropriate harvesting practices; Resources/habitat changes; Habitat destruction; Decreased viability of stock through contamination and disease; Biodiversity impacts)
- **Global change** (Changes in hydrological cycles; Sea level change; Increased UV-B radiation as a result of ozone depletion; Changes in ocean carbon dioxide source/sink function)



The Severity Assessment (Scaling/Scoping)

Present situation

- 0  No known impact
- 1  Slight impact
- 2  Moderate impact
- 3  Severe impact



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