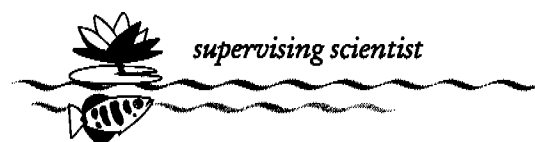




The Asian Wetland
Inventory as a tool for
providing information
on the effects of climate
change on wetlands in
Asia

M Finlayson, J Howes,
R van Dam, G Begg & K Tagi

October 2001



**THE ASIAN WETLAND INVENTORY AS A TOOL FOR PROVIDING
INFORMATION ON THE EFFECT OF CLIMATE CHANGE ON
WETLANDS IN ASIA.**

Kushiro Workshop

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Abstract

The environmental changes associated with climate change have serious implications for wetlands throughout the world. It is proposed that the Asian Wetland Inventory (AWI) has much to offer the Asian region assess and manage at least some of these implications. In particular it provides a method to get better data for climate change modeling and to assess whether the changes predicted are currently occurring or likely to occur.

The AWI is an Asia-wide program being developed by Wetlands International to encourage the adoption of an innovative and standardised approach to wetland inventory. The key features of the AWI is the use of a hierarchical, map-based approach defining the most appropriate land and resource management units at four levels of detail. The level of detail is related to the scale of the maps that are contained within a standardised Geographic Information System format. In essence, information about the geological, geomorphological, climatic, hydrological and biological features of entire river basins, as well as other information regarding wetlands within each basin, is collected and digitized in a standardised database system. The data will be provided for both international and national decision-making on watershed management and, amongst other things, will enable critical biodiversity hotspots to be prioritised for conservation. The inventory will also integrate information already collected in disparate analyses and programs.

With recent rapid population growth in Asia, there are serious water management problems throughout the region. These include diminishing water supplies, water contamination, accelerated erosion and sedimentation, groundwater depletion, flood damage and climate change. According to the Stockholm Environment Institute, 48 countries in the world will suffer from acute water shortages by 2025 and, with global warming starting to have a significant influence on large scale flooding of coastal plains in China and Bangladesh, improved water management is becoming increasingly essential for preventing or minimizing the downstream consequences. By supplying much of the information needed for climate change modelling the AWI is seen to be one of the best ways in which this can be achieved in a cost-effective and timely manner.

The Asian Wetland Inventory as a tool for providing information on the effect of climate change on wetlands in Asia.

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- **Ramsar Convention Bureau**
- **NCTWR staff - Ben Bayliss and John Lowry**

Background

Agreement (worldwide) that wetland inventory is a valuable tool for :

- **Locating wetlands in the landscape**
- **Identifying wetland functions and values**
- **Establishing a baseline for measuring future change**
- **Identifying priority sites for conservation**
- **Managing wetlands**



Since publication of the *Directory of Asian Wetlands* (Scott 1989) no updated regional information has been collected for the past 10 years.

Without such information :

- Landuse planning, development, management, training, education and public awareness is unlikely to be effective
- Data needed for climate change modeling would remain handicapped

Decision making about the conservation and wise use of wetlands would be more difficult.

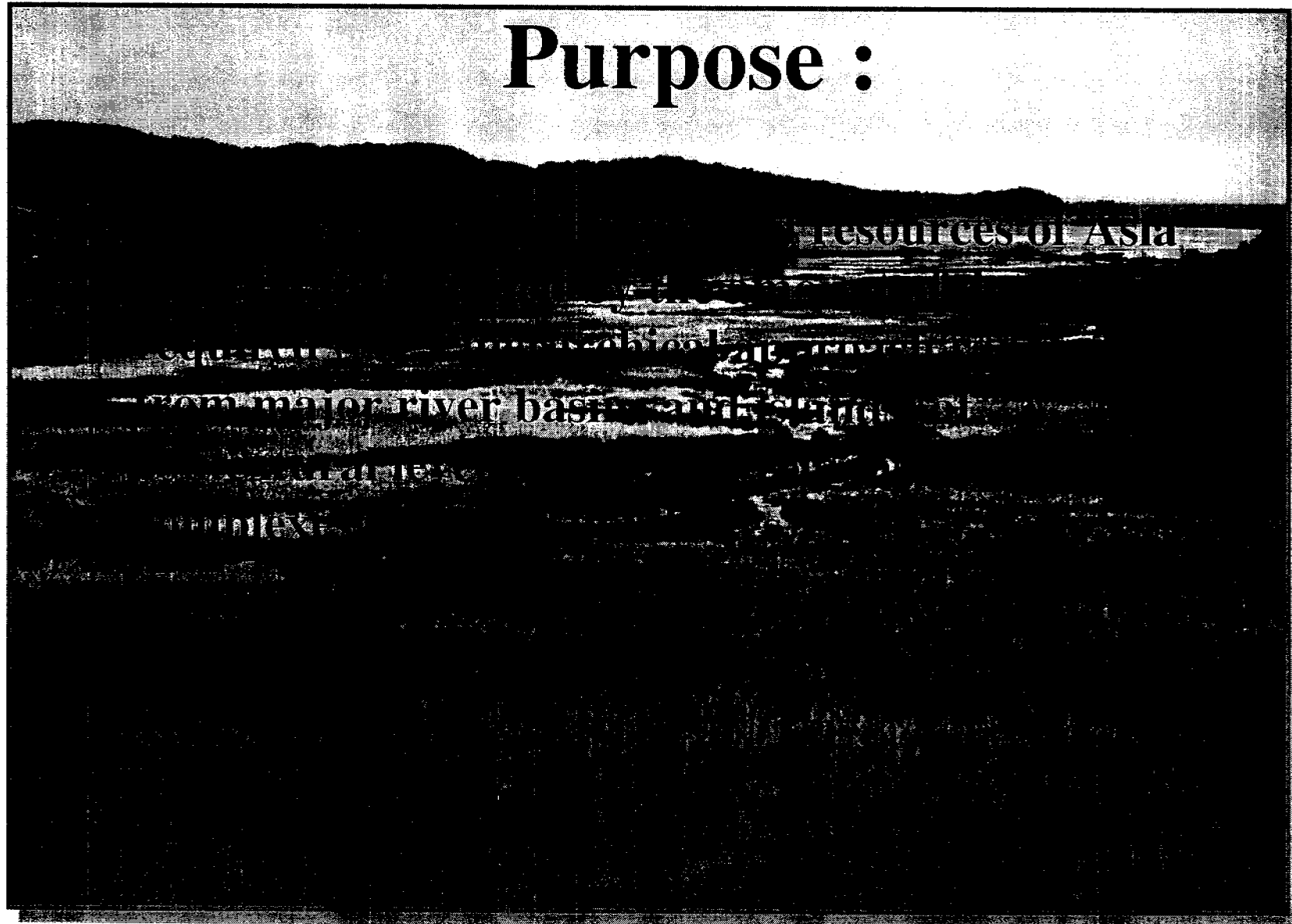


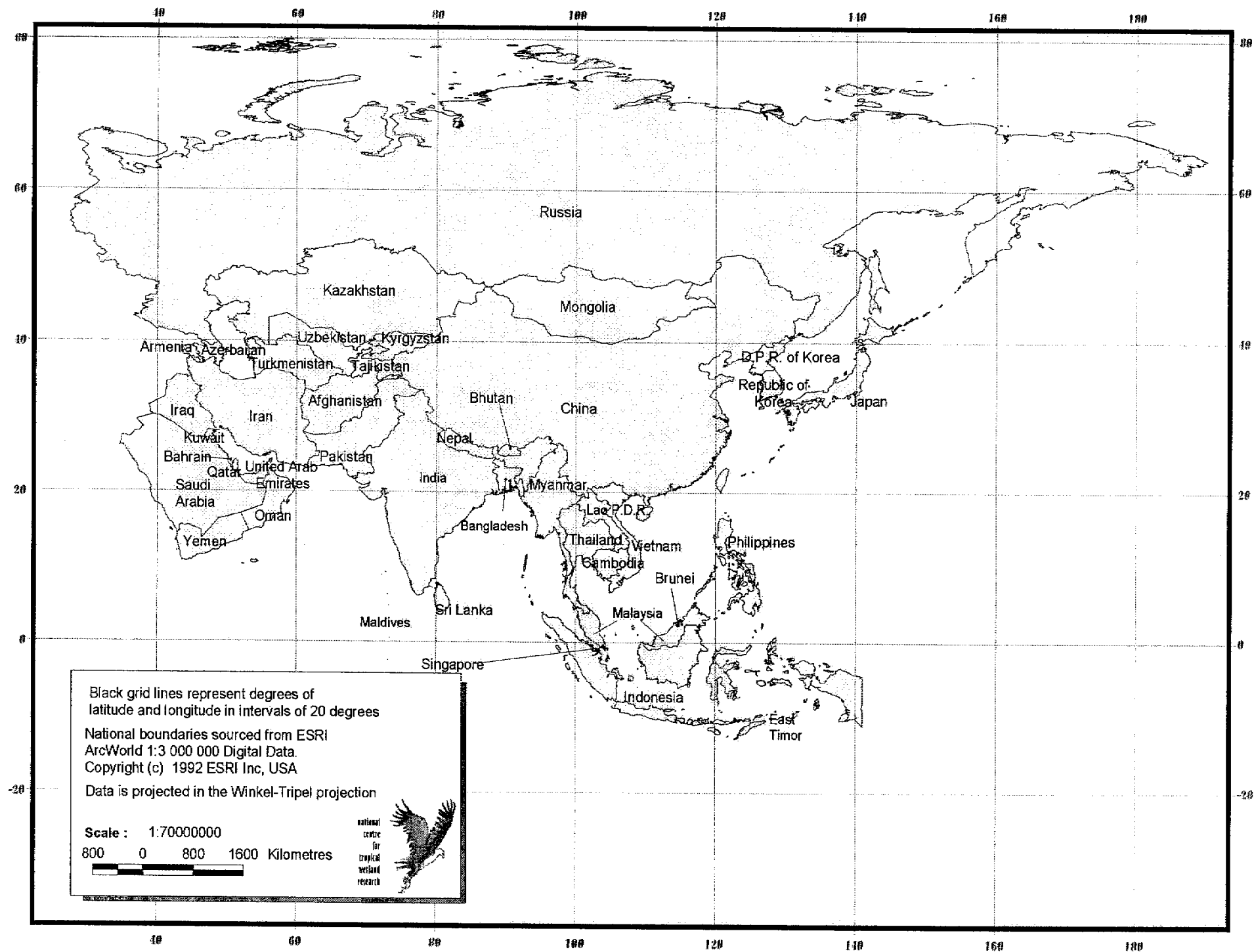
The Asian Wetland Inventory

Origins :

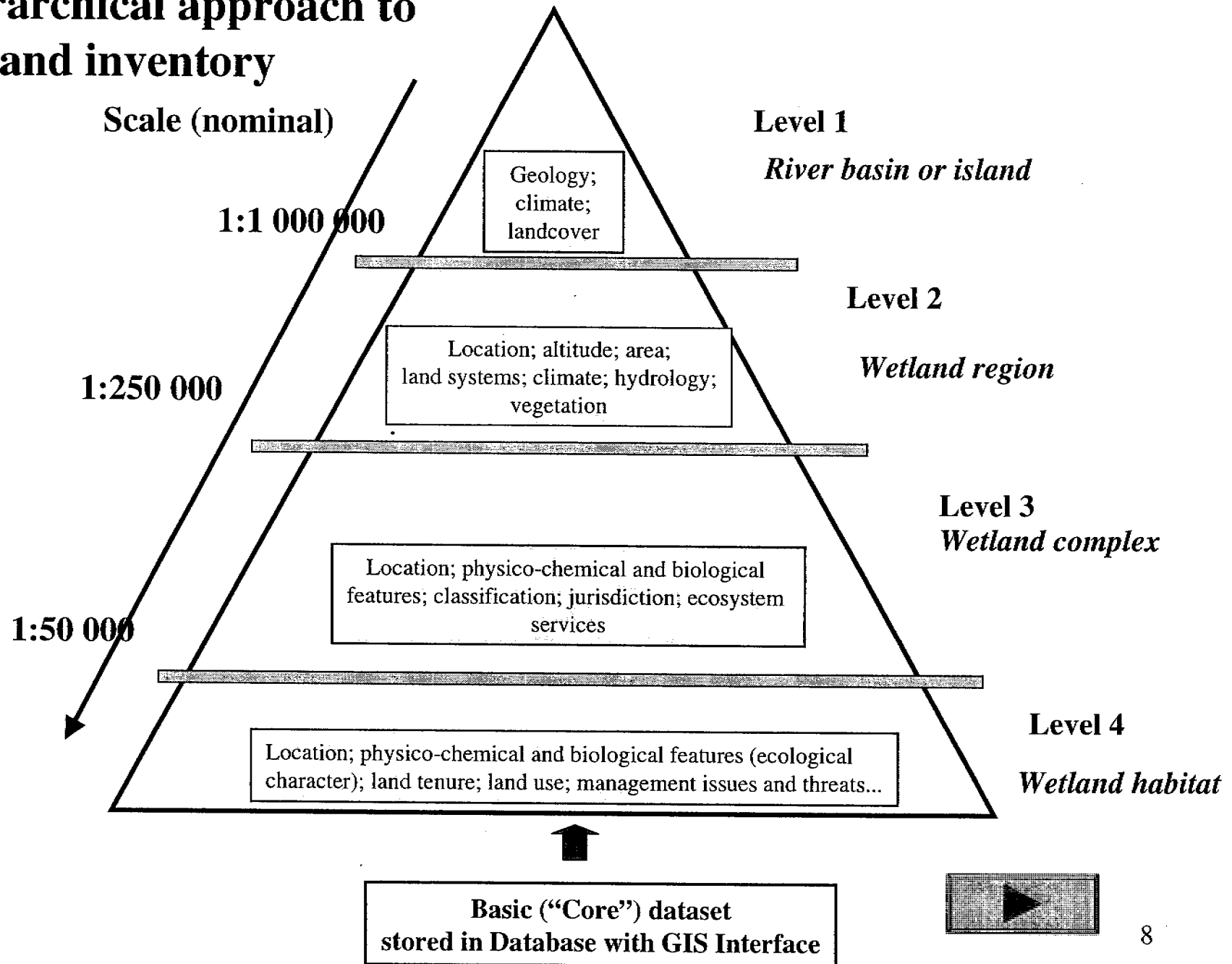
- **7th Conference of Parties of the Ramsar Convention (CoP7) in 1999, Costa Rica**
 - **Call for collection of standardised information on wetlands.**
- **Designed to:**
 - **Provide core data on Asian wetlands to support international conventions and treaties (Ramsar Convention, UNFCCC, UNCCD, CBD, CMS)**
 - **Analyse long term trends in status of Asian wetlands.**
 - **Enable regular revisions and updates.**
- **Disseminate these analyses for use in sustainable development and conservation.**

Purpose :

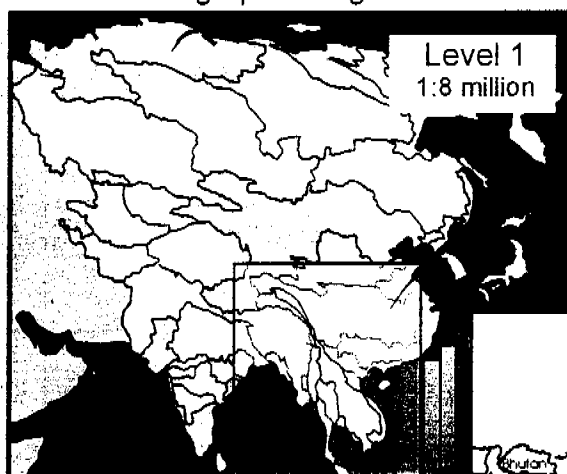




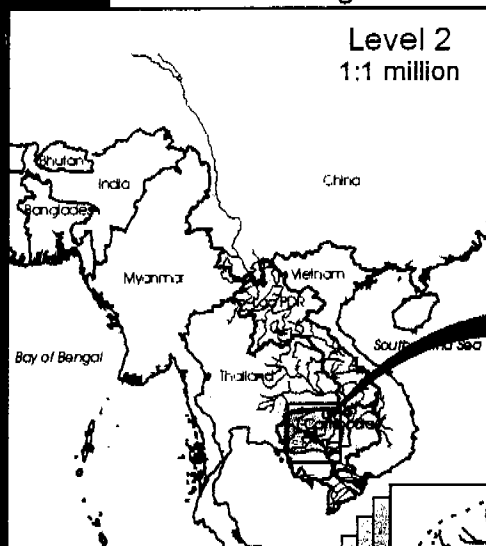
Hierarchical approach to wetland inventory



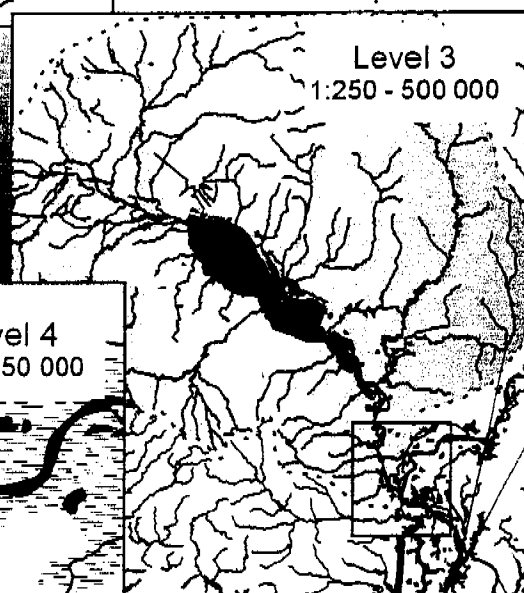
Geographic Regions



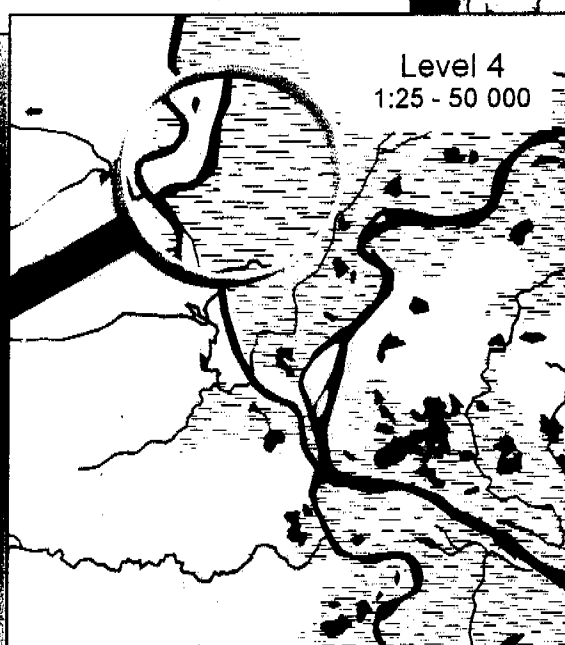
Wetland Region



Wetland Complex



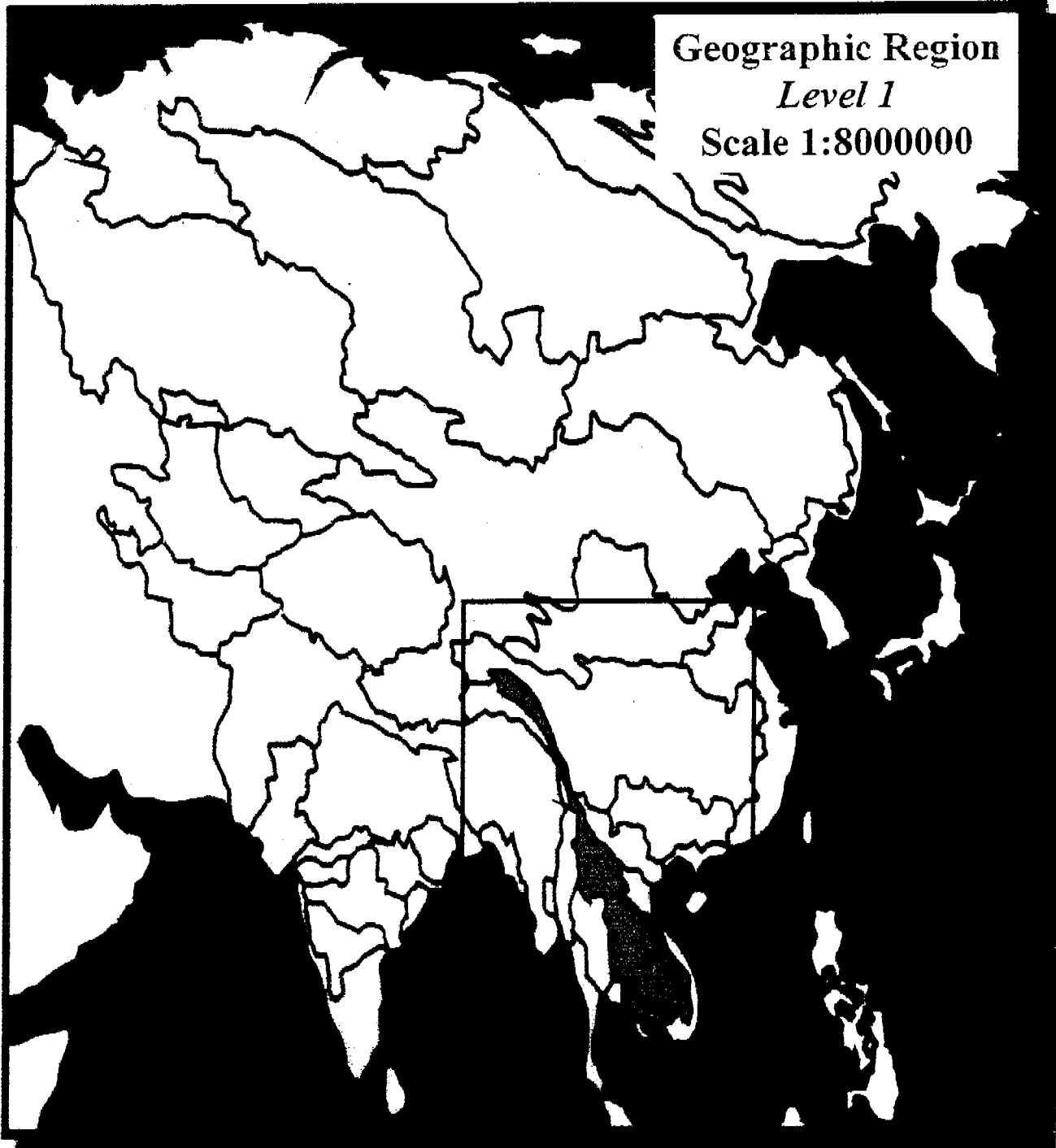
Wetland Habitat



Geographic Region

Level 1

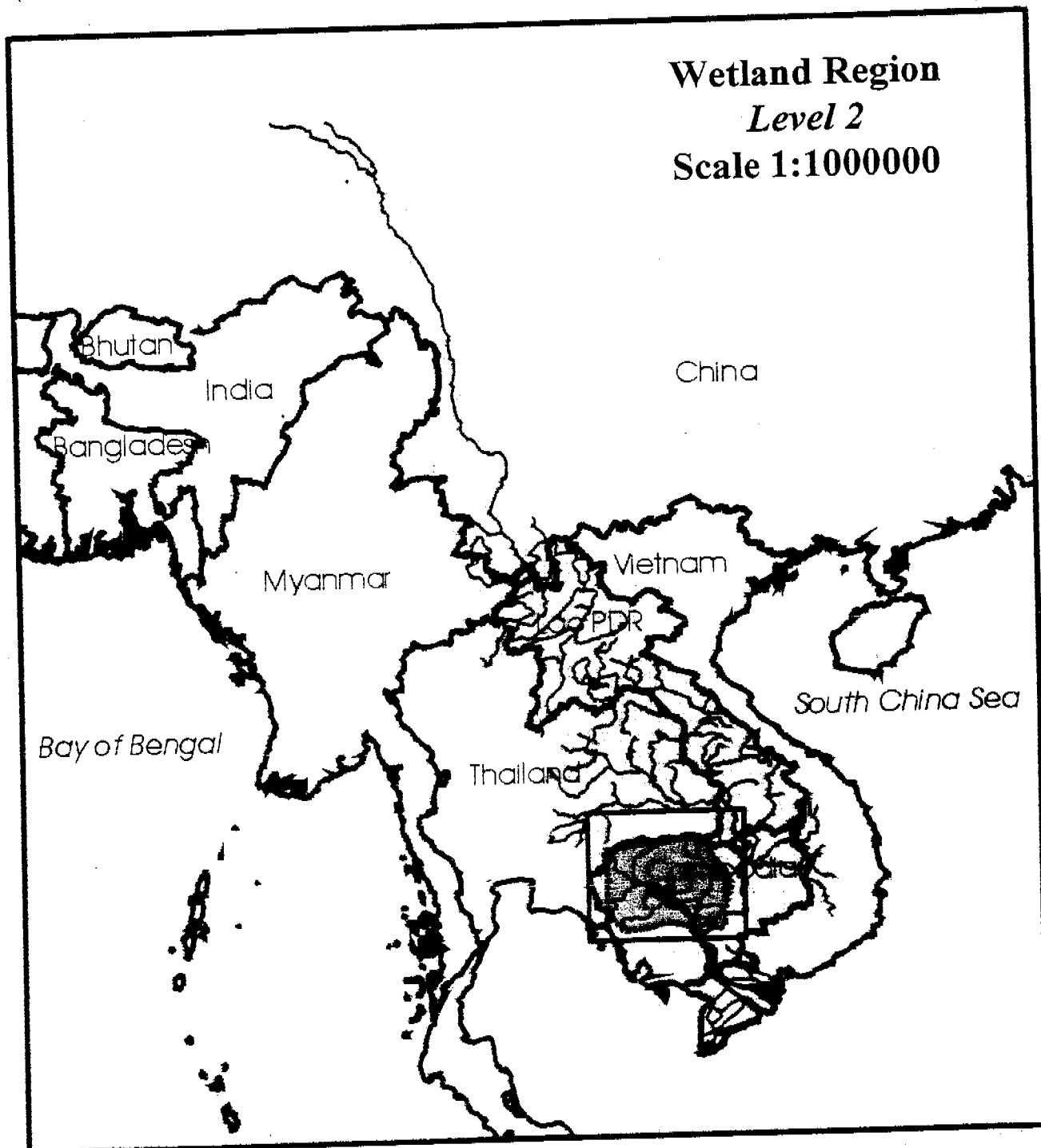
Scale 1:8000000

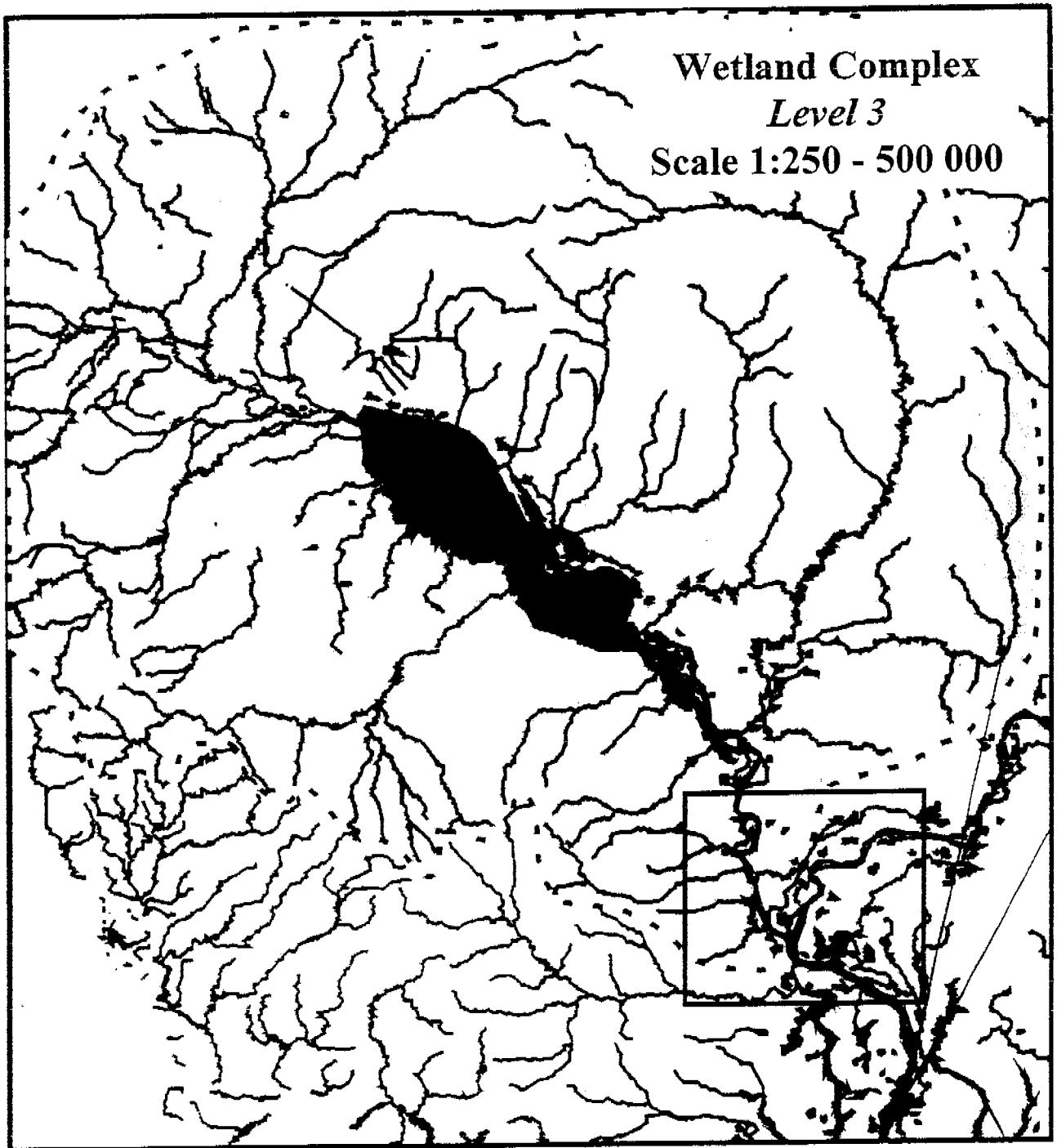


Wetland Region

Level 2

Scale 1:1000000

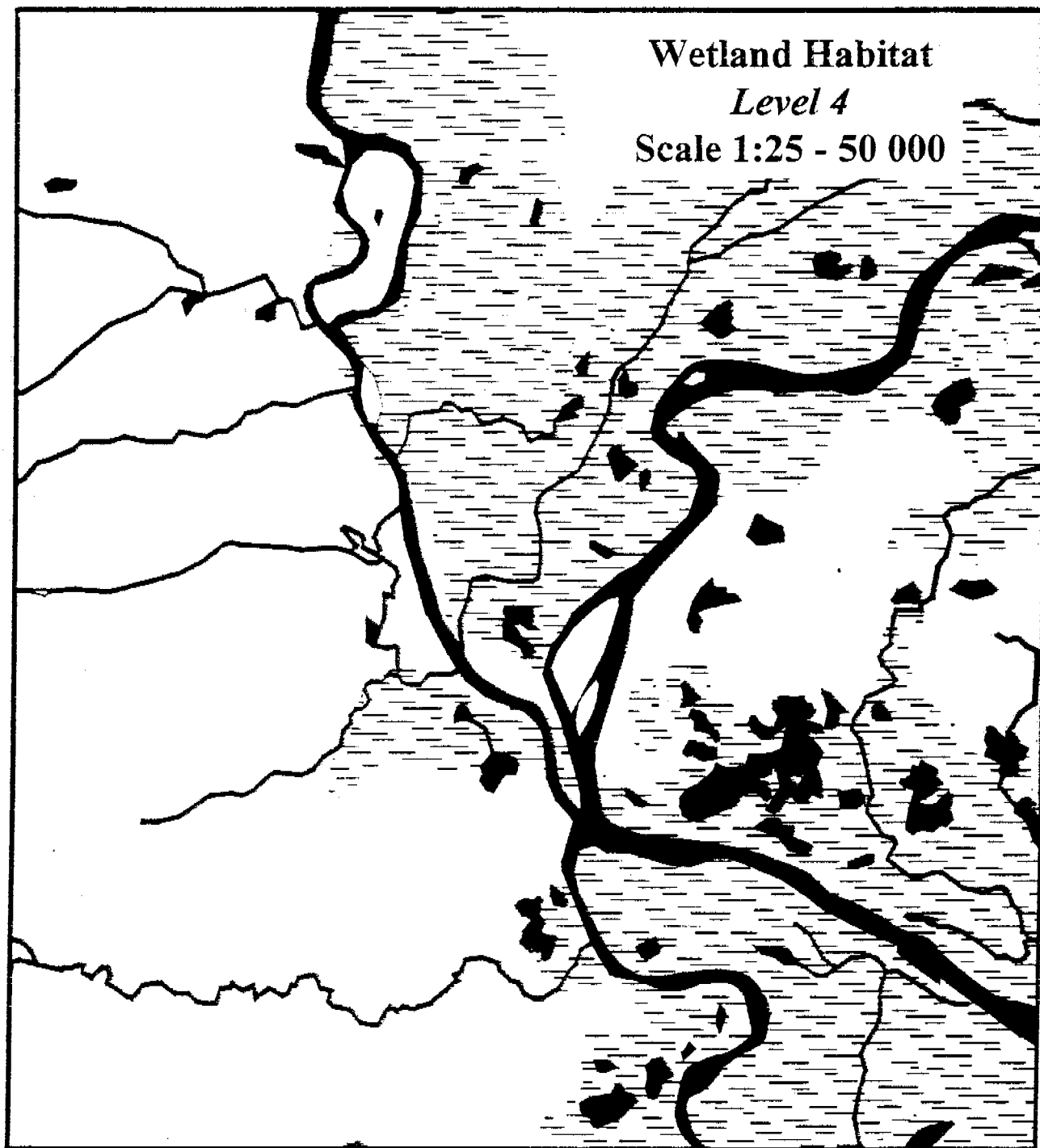




Wetland Habitat

Level 4

Scale 1:25 - 50 000



Projected climate change in Asia

(Lal et al 2001; McCarthy et al 2001)

◆ Temperature :

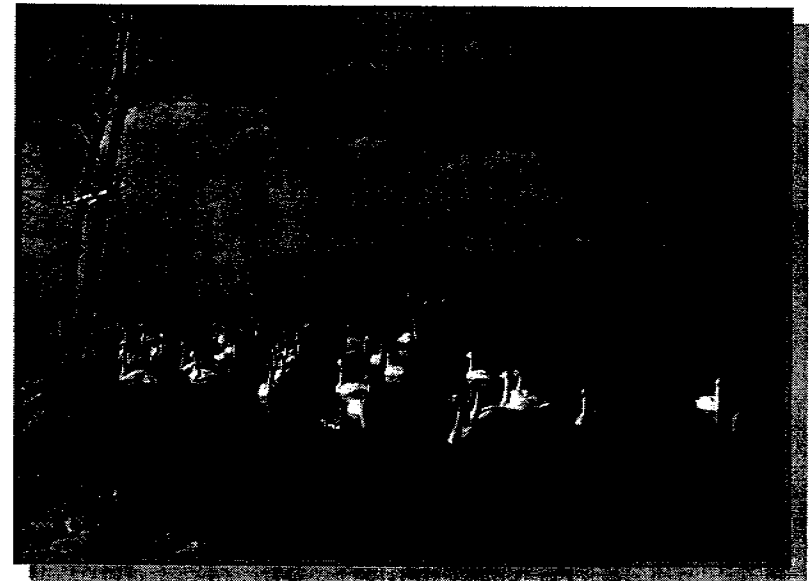
- Area-averaged annual mean warming of $3.8 (\pm 0.5)^{\circ}\text{C}$ by 2080
- Greatest over boreal Asia ; least over tropical Asia

◆ Precipitation :

- 19% increase over boreal Asia ; 0.1 – 5.1 % increase over tropical Asia
- Summer monsoon cycle :
 - increase in both intraseasonal and interannual variability of daily precipitation
- Cyclone frequency :
 - increased variability and intensity
- El Nino Southern Oscillation (ENSO) events :
 - Increased intensity of precipitation extremes (wet and dry)

◆ Mean Sea Level :

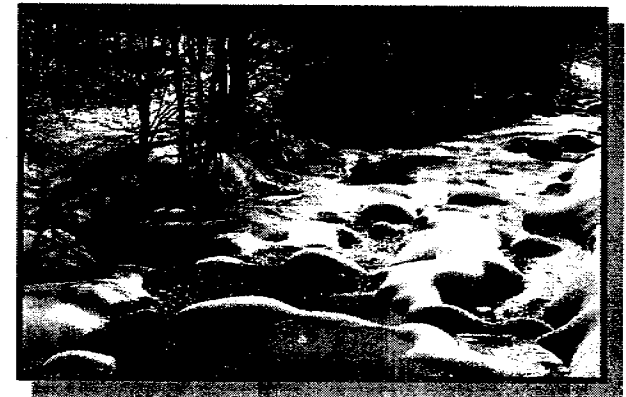
- 2 – 29 cm rise by 2050
- 9 – 88 cm rise by 2100



Impacts of climate change on functions and values of wetlands in Asia

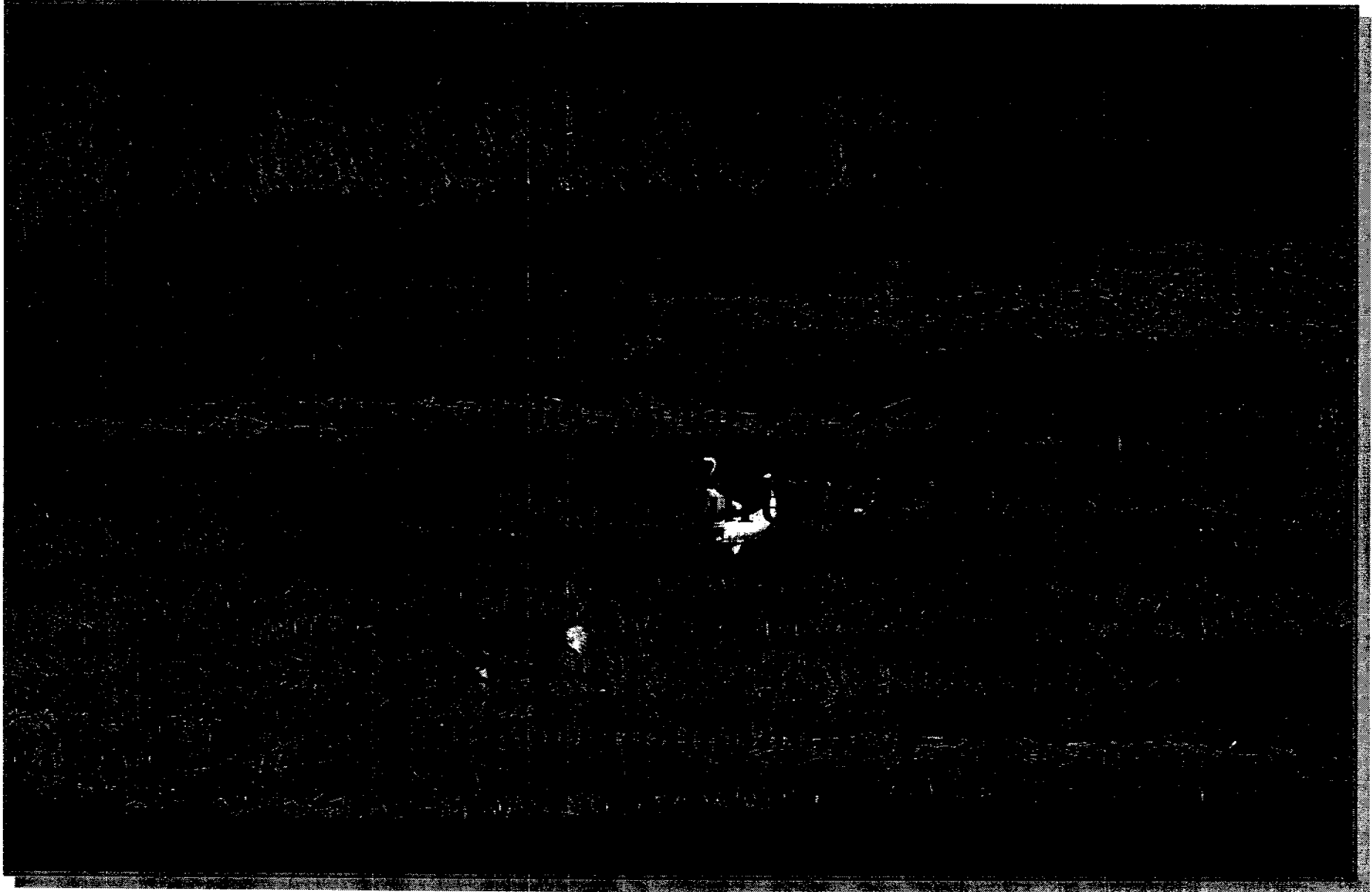
(McLean et al 1998; Peiying et al 2000; Kadono 2000; Lal et al 2001)

- Higher rainfall in Siberia —————> increased seasonal flooding and inundation
- Glacial melting in Himalayas —————> increased summer flows of perennial rivers
—————> followed by flow reductions as glaciers disappear
- Increased temperatures —————> water quality and weed problems in lakes
- Shrinkage of permafrost —————> reduction in boreal peatlands / releases of CO₂ & CH₄
- Increased evapotranspiration —————> negative impact on viability of tropical peatlands
- Accelerated sea level rise —————> inundation of major deltas (saline intrusion)
- More intense severe storms —————> erosion of coastal wetlands
- Reduced sediment discharge —————> erosion of coastal wetlands



• • • • •

Common to all will be :



Conclusions

- To offset climate change impacts in Asia the challenge is to :
 - gather reliable information on the location, size and ecological character of Asian wetlands.
 - use these data for:
 - climate change modeling,
 - estimating the amount of terrestrial carbon stored in wetlands, and
 - evaluating the role of different wetlands in the carbon cycling / exchange.
 - improve intergovernmental co-operation and networking.
- It is contended that the AWI is a potential means by which this can be accomplished.