3. How can the APEIS-IEM products be applied for policy formulation/implementation works?

IEM environmental monitoring data can provide early warning of environmental disasters such as dust storms and forest fires, and can be used to detect slowly worsening environmental degradation such as desertification, salinization, and other ecosystem changes resulting from human pressures. To ensure sustainable water supplies, entire catchment ecosystems must be protected, because they naturally capture, filter, store, and release water. The IEM integrated model offers a scientific tool for exploring policy options related to sustainable catchment management, which includes the efficient and recycled use of water and nutrients.

IEM products can be applied to the development of preparedness policies for both environmental disasters and environmental degradation in the following ways.

From satellite data and ground observations, we will develop methods of measuring parameters such as vegetation distribution, land surface temperature, snow accumulation, rainfall distribution, and soil water content, which are important to our understanding of the circulation of water and other substances. We will verify models of land cover and land use change as keys to more accurate balancing of water and heat energy cycles, and we will develop models for estimating the dynamic fluxes of water, heat, and carbon, land-use changes, and agricultural production. The results of all of this research will be submitted to the related departments of the Chinese Government to help them to formulate water- and land-use policies.

By developing methods of detecting the effects of global warming, we will try to assess how changes in the environment affect biodiversity and the carbon cycle. For instance, we can develop an ecological management model to forecast how human alterations to water circulation affect ecological functions such as the carrying capacity of land and the preservation of water resources. We will also try to promote the development of spatially distributed water and heat energy circulation models and use them to forecast soil water deficits and salt accumulation, as well as land-based pollution loads and substances, such as sediments, nitrogen and carbon in river, lake, and dam ecosystems. These results will be submitted to the Chinese Environmental Protection Agency, and will help them to plan for environmental reconstruction.

We will use an integrated catchment management model to evaluate the impact on river basin ecosystems and water resources of human activities such as dam construction, water transport between the Yellow River and Changjiang basins, afforestation, water-conserving agriculture, and environmental preservation, including industrial and residential waste water processing. This model will be used as a basis for proposing environmental management policies that support sustainable river basin development. The simulated results will be presented to the related departments of the Chinese Government, such as CCICED and the Changjiang Water Resources Commission of China.

4. Relevant Information (front/back covers)

Participating organizations:

National Institute for Environmental Studies (NIES), Japan

Institute for Geographical Sciences and Natural Resources Research (IGSNRR), Chinese Academy of Science (CAS), China

National University of Singapore (NUS), Singapore

Commonwealth Scientific and Industrial Research Organization (CSIRO), Australia

Chinese Ecosystem Research Network (CERN), China

Xinjiang Institute of Ecology and Geography (XIEG), CAS, China

Institute of Subtropical Agriculture (ISA), CAS, China

Northwest Plateau Institute of Biology (NPIB), CAS, China

Web site: http://www.nies.go.jp/basin/index-e.html

Web site

Integrated Environmental Monitoring（IEM） *http://www.nies.go.jp/basin/index-e.html*

This picture is painted by Yuri Nakajima

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