

NIED research activities in ASIA

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Summary of current activities and near future prospects - 1

Purpose

Investigate the risks of water disaster under the global climate change

Observation in Southeast Asia

- Hydrological and micro-meteorological observations in Khuwae Noi river basin in Thailand.
- Real-time water level monitoring in the upper Yom river.
- Cooperation with Royal Irrigation Department (RID) for more than 10 years.
- ✓ <u>No specific budget</u> for the observations
- ✓ <u>Utilize the heritage</u> for MAHASRI/AMY2008

Climate Change and water disaster in Asian Monsoon region





Application and validation of hydrological water balance model







Summary of current activities and near future prospects - 2

Cooperative research in <u>Yangtze River</u>

- Long term variability of hydrological cycles
- Prof. Tong JIANG, Dr. Qiang ZHANG (Nanjing Institute of geography and Limnology, Chinese Academy of Sciences (NIGLAS))
- Prof. Jun Matsumoto (Department of Geography, Tokyo Metropolitan University)

Water disaster risks in Japan

- Development of <u>atmosphere-biosphere-river coupling</u> regional climate model.
- Derive regional climate change scenarios by downscaling from hi-resolution GCMs
- Typhoons, winds, droughts and floods, coastal disasters.

Hydrological water budget model in Han-gang river basin (Northern part of Yangtze River)





(b) Land use/land cover

errors

Ratio of E



Station $\mathbb D$	同意差《》	横正差 (8)	平均度。	同亩NE	検INSE	蒸発量 の比率
CS	4.643	0.206	2.801	0.955	0.775	0.485
GT	0.574	3.249	1.975	0.907	0.822	0.775
HZ	0.171	1.072	0.429	0.933	0.872	0.688
JT	8.949	5.088	2.411	0.866	0.666	0.757
JZ	0.230	0.139	0.092	0.944	0.831	0.496
KF	1.027	3.136	2.089	0.909	0.854	0.630
LΗ	0.772	0.131	0.476	0.927	0.899	0.615
MD	2.042	1.090	1.582	0.912	0.795	0.797
NK	0.986	8.579	3.003	0.927	0.754	0.506
ХJ	0.820	0.399	0.282	0.943	0.800	0.498
XX	3.189	5.804	0.597	0.907	0.785	0.640
ZS	7.579	2.673	5.420	0.923	0.870	0.570
平均	2, 582	2.630	1.763	0.921	0.810	0.621
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(d) Simulation results at the 12 stations

Regional climate change scenarios for long-term water disaster risk assessment

Development of <u>atmosphere-biosphere-river coupling</u> regional climate model for long-term risk assessment

- Input into a flood inundation model and a wave model
- Influences and interactions of LULC and Biogeochemical cycles by coupling the <u>dynamic vegetation model</u> (Colorado Univ.: Japan-U.S. Liaison)
- Impact of extreme winds/droughts/floods on <u>human society</u> (Non-Life Insurance Rating Organization of Japan)
- Snow and ice disaster risk (Snow and Ice Research Center in NIED)



River model (10km, 93 river basins)