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ASCA/NIT Joint Program Seeks to Share New Information Technology with ASCA Member Countries

Approved and sponsored by its parent agency—the National Science Council—the Science and Technology Information Center (STIC) hosted the ASCA/NIT Joint Program in Taiwan, R.O.C., on Aug. 16-21, 1999. Agency heads, chief librarians and directors of information organizations from ASCA member countries were invited to this activity—the third of its kind after two ASCA workshops held in 1995 and 1997.

ASCA is a regional inter-governmental association founded in 1970 in Manila. Its objectives are to augment the sci-tech capability of Asian countries, to exchange sci-tech information resources and programs, to resolve bilateral or multilateral issues among member countries and to provide sci-tech consulting services to other associations within the region.

In hope of realizing these goals and benefiting the Asian information community, this program helped information providers in ASCA countries keep up with new information technology and stay aware of the recent dynamic changes that are affecting their profession. It is hoped that more useful and efficient information management and services will be provided to meet the information needs of users.

A total of 25 representatives from the leading information organizations of 13 countries took part in the program. The 13 countries consisted of Bangladesh, India, Indonesia, Malaysia, Nepal, the Philippines, Sri Lanka, Thailand, Vietnam and the four developed countries of Japan, Korea, Singapore and New Zealand; the latter four were invited to this event for the first time.

In order to add more informative and knowledge-rich features to this program, STIC combined it with another major event—the 11th International Conference on New Information Technology—which was also held at Taipei at the same time this year. Like all ten previous NIT Conferences held since 1987, it was sponsored by the US National Commission of Libraries and Information Science (NCLIS) and organized by Dr. Ching-chih Chen of Simmons College in the US; Dr. Chen is also an advisor to the NSC.

With long-term goals parallel to those of ASCA's, the 11th NIT Conference featured papers contributed by 47 information experts from more than 10 countries worldwide. "Digital libraries" was the main topic this year. Stimulating and rewarding interactions in formal and informal situations offered many good opportunities for experience sharing and cooperation among representatives from the participating countries.

In addition, the participants also took part in field trips to academic and industrial organizations in Taiwan, namely National Chiao Tung University, the Hsinchu Science-based Industrial Park, and the National Center for High Performance Computing.

Before leaving Taiwan at the completion of the one-week program, the participants contributed the following valuable suggestions for future efforts:

(1) Promotion of universal access and resource sharing in a global information society;
(2) More participation from local and international bodies;
(3) More defined collaboration, action plans and implementation;
(4) Centralized facilities for full-text document delivery;

(5) Creation of consortia;
(6) Digitization technology training;
(7) Evaluation project on public use of information technology and digital libraries;
(8) Development of high-speed communication facilities.

Thanks to close cooperation and hard work on the part of team-spirited STIC personnel, the National Central Library, the Library Association of China and the enthusiastic program organizer, this year's ASCA/NIT Joint Program was a very productive and successful event.

(Science and Technology Information Center, An-An Yeh)

Development of an Emergency Response and Disaster Recovery Decision Support System for Chi-chi Earthquake

Since the devastating Chi-chi earthquake on September 21, 1999, the government and public have both been pouring immense amounts of resources and manpower into relief efforts aimed at the stricken areas. National Center for Research on Earthquake Engineering (NCREE) immediately organized a large-scale survey team to investigate the affected area in an attempt to provide the correct damage information needed by government decision makers and researchers for the post-quake reconstruction work.

Geographic information system (GIS) is the perfect tool for organizing disaster-related information and can provide an excellent basis for post-disaster recovery efforts. During the emergency response phase, GIS can provide information about the affected area's population distribution, building distribution, road situation, rescue resources, and correct location of disaster sites. When information is continuously transmitted to relief headquarters, staff personnel can continuous enter the information into the GIS. By allowing command personnel to keep up with the rapidly-changing situation, the GIS helps them make optimal disaster relief decisions. During the disaster recovery phase, GIS can provide tools for planner to make optimal recovery plan and monitor their implementation.

After the Chi-chi earthquake took place, NCREE and the Office of the National Sci-tech Project on Hazards Mitigation promptly called a meeting of GIS experts and launched a full-scale effort to establish a GIS for the disaster area. In collaboration with the Geographic Information System Research Center at Feng Chia University, the NSC sent the disaster prevention project's completed electronic map with two geographical information teams on September 24th to support the disaster relief command centers in Taichung and Nantou county. These teams immediately began collecting and organizing information on the disaster, making disaster relief command personnel in the two counties very conscious of the assistance provided by the GIS, which helped them make the best possible decisions and judgements. However, since the first 72 hours after the quake—the most crucial period for relief efforts—had been missed, the GIS was unable to make as great a contribution to rescue work as it might have. Ne-vertheless, the earthquake recovery tasks in the months ahead will be even more arduous, and the issue of how to coordinate the rebuilding of an earthquake-resistant homeland with the central and local government remains to be settled. However the GIS' spatial analysis and planning capability can be used in the days ahead to locate the areas most suitable for reconstruction and help draft a reconstruction plan.

The information research team of the Office of the National Project on Hazards Mitigation invited the directors and supervisors of the Geographical Information Association to a meeting at noon on September 27 to discuss how to help the government accelerate the establishment of a "921 Earthquake Information Collection and Post-Quake Reconstruction Decision-Making Support System." Teams directed by experts and specialists were immediately set up, and graduate and undergraduate students with experience in geographical information were recruited to help in the creation of a system. It is hoped that a decision-making support system can be established as soon as possible, in hope that it can help government agencies accelerate postearthquake reconstruction work. The content of each team's work is as follows:

1. Information integration team: This team is responsible for using GIS technology to organize earthquake damage data collected by government and academic units in the form of databases, which will later be used to develop a post-disaster reconstruction application system.
2. Aerial photograph interpretation team: This team is in charge of correcting the coordinates of the aerial photographs taken by the Agricultural Aviation Office on September 22 in order to facilitate overlay with a digital geographical data for the purpose of interpreting landslides and other damage.
3. Secondary disaster analysis team: This team will use the corrected aerial photographs to analyze landslides caused by the earthquake and

assess the likelihood of secondary debris flow.
4. Post-quake reconstruction team: This team is responsible for providing relevant data needed by the government for the planning of post-quake reconstruction.
5. Damage integration team: This team is responsible for marking the locations of earthquake damage recorded in field surveys on digital maps in order to provide a comprehensive picture of earthquake's aftermath.
6. Map-making team: This team is in charge of producing various types of damage distribution maps for government and public use.
7. Disaster prevention application system development team: This team is responsible for developing a geographical information application system on the Internet; this system will allow the public and government units at all levels to access earthquake survey databases.

The reconstruction stage has already begun for the Chi-chi earthquake. Nevertheless, reconstruction work includes countless tasks and time will be a critical factor. It is therefore urgent to organize post-quake survey data and establish an enormous geographical information database. The information section of the Office of the National Project on Hazards Mitigation is responsible for organizing earthquake-related data, and the digital geographical data in nine large databases belonging to the National Land Information System will be used as a basis for the post-quake reconstruction decision-making support system.

Disaster Relief Database of the National Project on Hazards Mitigation

The "Office of the National Sci-tech Project on Hazards Mitigation" is a dedicated unit set up to implement the NSC-funded national project on disaster prevention. In the wake of this year's devastating Chi-chi earthquake of September 21, the databases compiled by the project office provide a foundation for recovery support systems. In addition, the project office is actively collecting post-earthquake survey data for use in a post-earthquake geographical information system that will be made available to government for use in reconstruction planning and by relevant disaster mitigation research projects.

Databases that have already been completed and are available for use currently include:

I. Basic databases

1. Basic all-Taiwan databases: In-cludes 1/50,000- and 1/25,000-scale maps, administration divisions, river basin boundaries, water catchment area boundaries, active fault locations, and geological maps.
2. County/city and river basin databa-ses: Including color and grayscale geomorphologic maps, 1/25,000-scale topographic maps, administrative boundaries, river basin boundaries, water catchment boundaries, place names, stream systems, roads, land use, and buildings.
3. Electronic maps and scanned image files: Scanned images of 1/25,000-scale and 1/50,000-scale color maps of Taiwan, scanned im-ages of 1/5,000-scale photographs, and 1/25,000- and 1/5,000-scale electronic maps—including county/city boundaries, town/township boundaries, place names, river sys-tems, roads, road names, railways, buildings/landscape features, schools, and street outlines.
4. Water catchment databases for the three counties of eastern Taiwan: Including classified maps of land use throughout Taiwan; distribution of river systems, cities, and villages; boundaries of primary, secondary, and satellite catchment areas; national highways; provincial highways; county roads; county/city boundaries; stream boundaries in the three counties of eastern Taiwan; contour lines; railways; and the boundaries of Sun Moon Lake.

II. Environmental disaster-related databases

1. Hazardous stream distribution maps: 485 streams throughout Taiwan have been designated hazardous streams on the basis of the COA's hazardous stream conditions; these streams are classified by county/city.
2. Flooding probability data: Flooding probability data has been derived from simulations conducted by the

(Continued on next page)

Office of the National Project on Hazards Mitigation, which used GIS technology to add meaning to geographical data; data has been generated on the likelihood of flooding in Taipei county and city, Kaohsiung county and city, Chiayi county and city, Tainan county and city, Taoyuan county, and Yunlin county when 150mm, 300mm, 450mm, or 600mm of rainfall occurs in one day.

3. Data resulting from investigation of the Juili earthquake an Chiayi county: A case study database was created from data collected during the investigation of the Juili eart-hquake. The content of this database includes locations of deaths, damaged schools, on-site pho-tographs, and earthquake monitoring station data. The database uses a GIS to present relevant data.
4. Regional planning databases: The content of these databases results from the classification of regional planning data deriving from the MOI Construction & Planning Administration's "Environmental Disaster and Building Site Safety Query System Establishment Project." Database content includes 1/25,000-scale maps of counties and cities, town/township boundaries, public land maps, built-up land, urban planning maps, non-urban land use zoning maps, land use maps, conditional development zoning maps, development potential grading maps, land development type maps, development restriction grading maps, development priority maps, restricted development district maps, road maps, river basin maps, river maps, reservoir water catchment area maps, fault maps, geological maps, slope maps, slope orientation maps, contour maps, soil maps, soil and vegetated areas, precipitation and erosion index maps, water quality/water flow con-servation area maps, maps of stream basins with debris flow hazard, flood-sensitive lowland areas, geological-disaster sensitive areas, groundwater injection-sensitive areas, erosion-sensitive areas, and landslide-sensitive areas.

III. Databases connected with the Haz-Taiwan Earthquake Damage Assessment and Decision-making Support System

1. Earthquake hazard databases: Databases produced by NCREE containing drill core data, soil liquefaction potential, and earthquake hazard distribution throughout Taiwan. Databases produced by the Central Weather Bureau containing earthquake response data for bridges, earthquake response data for multi-story buildings, earthquake distribution, and free-field earthquake response data.
2. Databases connected with major facilities: Databases produced by National Taipei University of Technology to meet the Haz-Taiwan system's need for data on pipelines and major facilities in the demonstration areas of Taipei and Chiayi. The content of these databases includes data on hospitals and medical clinics, fire departments, police stations and emergency rescue units, schools, buildings containing hazardous materials, tap water pipelines, tap water treatment plants, water transfer facilities, water storage facilities, sewer lines, sewage treatment facilities, sewage transfer facilities, oil pipelines, oil refineries, oil transport facilities, oil storage facilities, gas pipelines, gas compression facilities, generating stations, transformer stations, power distribution stations, telecommunications centers, radio stations, television stations, weather stations, and other communications facilities.
3. Basic databases on buildings, population, and transportation: Databases produced by the project office to meet the Haz-Taiwan system's need for data on buildings, population, and transportation in the demonstra-tion areas. Content includes data on ordinary buildings, transportation, and population.

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