

# 1999 International Perspectives: Taiwan and Japan

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"We also got a chance to see a student-designed, bicycle-powered hydrofoil. I thought that would be a great project for students at IIHR to do. Between our mechanical ship group and our more hands-on civil students, we could design a very good pedal powered hydro-foil."

- Jeff Clark, Diary: Taiwan and Japan

**University of Iowa Study Abroad Programs****International Perspectives in Water Resources Planning in Taiwan and Japan****May 23 - June 6, 1999**

An initiative of IIHR  
The University of Iowa College of Engineering, Iowa City USA  
in collaboration with  
National Taiwan University, Taiwan  
Hiroshima University and Kyoto University, Japan  
Ministry of Construction and City of Osaka, Japan

**Purpose**

The University of Iowa International Perspectives in Water Resources Planning study abroad program focuses each year on a country or a world region for an intensive and in-depth exposure to historical, cultural, social, economic, ethical, environmental, and political conditions that impact water resources projects in order better to prepare students for careers that are becoming increasingly global in nature. The 1999 program takes place in Taiwan and Japan.

**Academic Program**

The course will start with preparatory lectures by experts on the history, culture, and water resources projects of the countries to be visited. The lectures will be held on The University of Iowa campus during April and May 1999, but video taped for viewing by off-campus participants. The course finishes with post-visit written reports by participants. During the visit abroad, participants will interact with local students and attend seminars by local experts, which will emphasize the planning, socio-economic and environmental impacts, rehabilitation programs and problems, legal, cultural and institutional aspects of water resources projects. Participants will visit technical, historical, and cultural sites.

**Specific Activities Tentatively Planned**

Workshops and seminars will be held at governmental offices and universities in both Taiwan and Japan. Many opportunities are planned to encourage interaction of course participants with Taiwanese and Japanese students. In Taiwan, the technical focus will include field trips to the Feitsuei

Reservoir, the Taipei Flood-Control Project, and the Chi-Chi Diversion Project. In Japan, participants will visit the Nukui Dam construction site, tour Tama River in Tokyo, and visit the Hiroshima Peace Park. The Japan part of the course also will include a cruise in Osaka Bay to Osaka and Kobe and to Akashi, to see modern harbor facilities, famous sea vortices in Naruto Channel, and the world's largest suspension bridge. Participants will have opportunity for sightseeing in Taipei, Taichung, Hiroshima, Kyoto, and Tokyo.

## **Tentative Schedules**

Taiwan - May 23 - May 30

Japan - May 30 - June 6

## **Credit and Instructors**

Each participant can earn 0-3 semester hours of credit depending on agreement with the instructors regarding assignments and methods of evaluating student's work. The course will be conducted by Drs. A. Jacob Odgaard (Taiwan) and Tatsuaki Nakato (Japan), staff members of IIHR, both with academic appointment in the Department of Civil and Environmental Engineering at The University of Iowa.

## **Cost**

The estimated cost for the program is \$2,800, including fees, round-trip air fare, lodging, meals and travel expenses abroad, and all educational and administrative costs. Financial aid may be applied toward program costs. Students currently receiving federal, state or institutional aid will remain eligible for most forms of support while participating in this program. In addition, selected students may qualify for financial assistance of up to \$1,200.

## **Eligibility**

The course is designed for seniors and graduate students who wish to become engineers, economists, planners, legal and management specialists, and environmental, social and political scientists but is open to all professionals working in these fields. The course provides preparation for the increasingly international scope of practices and services in the field of water resources planning and management.

## **Application Procedure and Deadline**

Completed applications, including a non-refundable application fee of \$50, must reach The University of Iowa's Office for Study Abroad by February 28, 1999. The complete application includes the application form, available from The University of Iowa Office for Study Abroad, the most current transcript of grades, a letter of recommendation and the \$50 application fee. Applications will be reviewed as they are received, so early application is encouraged.

## **Previous Course**

Some student reactions to the previous course in India are as follow:

"It has made me a better person...The lectures gave us an entirely new outlook on the issues related to water resources in India..."

"Meeting with students was an invaluable experience, one of the most important parts of the trip..."

"This experience will be invaluable to me in my professional career...altogether a worthwhile investment of time and money."

"I hope this class will continue...I thoroughly enjoyed the trip and recommend the course to anyone."

## **For Further Information, Please Contact**

Office for Study Abroad  
28 International Center  
The University of Iowa  
Iowa City IA 52242  
Phone: (319) 335-0353; Fax: (319) 335-2021  
e-mail: [study-abroad@uiowa.edu](mailto:study-abroad@uiowa.edu)

### **Also**

Visit IIHR at its Web site:  
<http://www.iihr.uiowa.edu/>

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# INTERNATIONAL PERSPECTIVES IN WATER RESOURCE PLANNING IN TAIWAN AND JAPAN



By

Nicola Mawer

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Class Summary ♦♦♦♦♦♦♦♦♦♦ Group Photograph ♦♦♦♦♦♦♦♦♦♦♦♦♦♦♦♦ My Journal ♦♦♦♦♦♦♦♦♦♦♦♦♦♦♦♦ Project  
Details ♦♦♦♦♦♦♦♦♦♦ Photographs

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## **Course Description**

For the past two years [The University of Iowa](#), in conjunction with [IIHR Hydrosience & Engineering](#), has offered a summer class entitled ♦International Perspectives In Water Resource Planning♦. This is no ordinary summer class as you are about to find out. For the duration of the class it occupies the student's time 24 hours a day, 7 days a week, yet there are no lectures and there is no homework. It is physically exhausting and yet the only physical exercise is a game or two of softball. It is mentally demanding but the unusual stimuli encountered cause minimum brain strain. This is no ordinary summer class!

With the increase in the number of businesses competing in a global market the purpose of this class is to give students first hand experience of foreign countries. A different country, or region of the world, is selected as the focal point for the course each year. Although the specifics of the issues change for each country, every year the students are given a detailed insight into all aspects of society that are related to water resources. This is a truly multi-disciplinary course covering historical, economic, environmental, technical and political issues while giving the student a personal feel for the culture of the region visited. Full details and contact information regarding this class can be found on the IIHR web site.

In 1998 the course concentrated on India and students spent an unforgettable three weeks traveling through the country. This year the course took a two-week long trail-blaze through Taiwan and Japan, from May 22<sup>nd</sup> until June 6<sup>th</sup>. It is confirmed that China will be the destination for this course in the first year of the new millennium. Beyond the year 2000 plans are being made for expeditions into other regions of Asia, Africa and South America.

For ventures such as these, much organization is required prior to departure day. This year, [Dr. Odgaard](#) supervised the Taiwan visit and [Dr. Nakato](#) coordinated the schedule for Japan. Both Dr. Odgaard and Dr. Nakato are affiliated with IIHR. Two additional IIHR faculty members visited Taiwan, [Dr. Krajewski](#) and [Dr. Patel](#). The arrangements for this course could not be made without utilizing the contacts established through IIHR and its graduates from years gone by. No individual and perhaps no other organization could provide a course such as this. The uniqueness of this course is due to the enthusiastic contributions from IIHR graduates now resident in foreign countries.

## **Participation and Academic Credit**

The course is designed for senior and graduate students in a variety of subjects. Due to the diversity of the course content it is appropriate for engineers, economists, management students and environmental, social and political scientists. Registration is not limited to University of Iowa students. The course is available to students from all universities and is also open to professionals working in related fields. The group this year comprised ten students from four different universities across the United States. Participation from international students, from universities worldwide is encouraged.

There are three parts to the course. The first requirement is to attend a set of pre-trip seminars arranged by the University of Iowa. For those students not able to attend in person the seminars are recorded and provided on video. Seminar notes and handouts are also provided to those students absent. These seminars introduce the students to the country, or region, that they will be visiting. The purpose is to give a very broad background to the country in terms of history, economy, climate and culture. If necessary an introduction to the language of the country is also provided during these seminars. As far as is possible these seminars are given by natives of the region to be visited. This year the University of Iowa Taiwanese Student Association (UINTA) provided the seminars on Taiwan and Dr. Nakato, being of Japanese origin, provided general information about Japan. The full value of these seminars is not realized until later in the course, during the trip abroad, but at the time they provide an opportunity for students to ask questions and refine their knowledge of the region concerned.

The second and most significant part of the course is the actual time spent in the country on which the class is focused. A lot can be learnt in the pre-trip seminars but it cannot rival first hand experience. Whilst traveling, intense learning takes place and the knowledge gained is not the sort that can be imparted in a classroom situation. From taking a shower in the morning to going out to dinner, each day is full of new perspectives of everyday tasks. From eating local delicacies in traditional restaurants to smelling moist, mountain air on the other side of the world, every sense is overloaded with unusual stimuli. These experiences are unique to each participant.

The predominant part of the time abroad is spent meeting local students, government officials, managers and employees from consulting companies all of whom are involved with the issues surrounding water resource planning. Meetings, seminars and discussion sessions are organized to enable the students to learn of specific details relating to water resources within the region. Students gain a sense of the delicate balance that exists between the local environment, current social values and economic development requirements with regard to water resources. It is not however a unidirectional learning process. During seminars and meetings students are able to exchange knowledge and experiences with a hope that both groups will benefit. The local groups involved find themselves in a unique learning environment where many comparisons are drawn between their experiences and those of other countries. Site visits provide another situation in which students gain first hand knowledge of international water resource issues. Water resource projects ranging from hydroelectric power plants to water treatment works to flood relief schemes and river renovation sites were all included in the 1999 trip to Taiwan and Japan. ♦ Time is spent learning of the economic and political decisions behind the projects and also of the engineering and environmental challenges involved in construction and operation. The time abroad is not all work. A surprising amount of time is spent socializing with the hosts. Many of the groups that participate in seminars and meetings also arrange to provide evening entertainment in the form of dinner or even a banquet. Some time is also set-aside for relaxing and taking in the tourist attractions of the area. While enjoying a little freedom students learn more of the culture and history of the region. Throughout the duration of the trip students are asked to keep a journal of the events, the major water resource issues encountered and their personal impressions.

The third element of the course is compulsory for those taking the class for academic credit. To take the class for credit and have it contribute towards your degree a report or post-trip presentation is required. The exact requirements vary for each participant and are determined to some extent by your advisor or the course organizers. This year the exact format of the report was left up to the individual. This interactive documentation includes much of the information collected during the trip and is my submission for credit. The following four sections provide a mixture of detailed accounts and more general information about the 1999 trip to Taiwan and Japan:

Class Summary	A general overview of the course including personal impressions and comments. Highlights from the 1999 trip to Taiwan and Japan.
Group Photograph	Group photograph of the 10 students involved in the 1999 trip to Taiwan and Japan. Links to details of each student and their university are available <a href="#">here</a> .
My Journal Project	Details of the 1999 trip to Taiwan and Japan as a day-by-day account. The journal is illustrated using photographs from the trip.
Details	Information about selected water resource projects visited in Taiwan and Japan.
Photographs	A selection of favorite photographs from Taiwan and Japan. ♦

## Sponsorship

This course is currently sponsored by [IIHR Hydroscience & Engineering](#), which is affiliated with the [The University of Iowa](#) College of Engineering. The organizers are constantly seeking additional sponsorship in order to make this course affordable to all



# Group Photograph

From left to right:

Owen Kubit, Nicola Mawer, Andrew Smith, Kevin Nielsen, Jennifer Holman-Dodds, Cat Shrier,  
Kuoshu Chiu, Scott Morgan, Alicia Urban, Jeff Blank



[More information about students](#)



# PROJECT DETAILS

[Class Summary](#) [Group Photograph](#) [My Journal](#) [Photographs](#)

[Back to Introduction](#)

Below are the links to pages containing information about selected water resources projects visited during the 1999 International Perspectives in Water Resource Planning course organized by Iowa Institute of Hydraulic Research (IIHR) in conjunction with the University of Iowa.

## Taiwan

## Japan

Chi-Chi  
Common  
Diversion  
Weir

Feitsui Dam  
and  
Reservoir

Hydraulic  
Laboratory of  
Taiwan  
Provincial  
Government  
Keelung  
River

Development  
Tan-Shui  
River Basin  
Flood  
Control  
Center

Kyocera  
Ceramics  
Company  
Murano

Water  
Treatment  
Plant  
Ujigawa  
Hydraulics  
Laboratory,  
Kyoto

University  
Disaster  
Prevention  
Research  
Institute  
Nukui Dam  
and  
Reservoir

Ara River  
"Super  
Levee",  
Tokyo

[Class Summary](#) [Group Photograph](#) [My Journal](#) [Photographs](#)



## Chi-Chi Common Diversion Weir

### Location

- ◆ Midstream of Chou-Shui River in
- ◆ Nan-Tou County

### Benefits

- ◆ Improve intake facilities
- ◆ Stabilize irrigation water supply
- ◆ Allocate water efficiently
- ◆ Prevent disputes over water allocation
- ◆ Flood control
- ◆ Pollution and sediment management

### Purpose

- ◆ Domestic, Industrial, Agricultural
- ◆ Replace multiple stage irrigation intakes
- ◆ Reduce sedimentation problems

### Weir Features

- ◆ Cost: 32.65 Billion NT Dollars
- ◆ Weir length ◆ 352.5 m
- ◆ To be completed in 2000

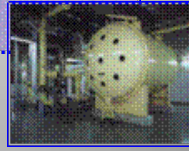


## Feitsui Dam and Reservoir

- ◆ Owner ◆ Taipei Municipal Government
- ◆ Operator ◆ Taiwan Power Company
- ◆ Location ◆ Peishih Creek, Tan-Shui River Basin
  - ◆ 90 km upstream from Taipei City
- ◆ Design and Construction Facts
  - ◆ Feasibility study ◆ 1977
  - ◆ Reviewed by US Bureau of Reclamation
  - ◆ Detail design ◆ 1980 through 1987
- ◆ Selection Criteria
  - ◆ Gentle slope
  - ◆ Low sedimentation rate
  - ◆ Drainage area general undeveloped
- ◆ Dam and Reservoir Facts
  - ◆ Three-center double curvature and variable thickness arch dam
  - ◆ Height ◆ 122.5 m
  - ◆ Crest length ◆ 510 m
  - ◆ Reservoir Storage ◆  $406 \times 10^6 \text{ m}^3$
  - ◆ Catchment area ◆  $303 \text{ km}^2$
  - ◆ Generation Capacity ◆ 70 MW
- ◆ Unique foundation construction in which clay layers were replaced with cement grout between rock layers



## Murano Water Treatment Plant



Ozone Generator

### General Background

- ◆ Murano provides about 85% of the City of Osaka's water
- ◆ Water supply from Yodo River
- ◆ Plant capacity ◆ 1.8 million cubic meters per day
- ◆ Murano is the 3<sup>rd</sup> ◆ largest water treatment plant in the world

### Plant Process

- ◆ primary settling ◆ rapid sand filtration ◆ ozonation ◆
- ◆ granular activated carbon (GAC) ◆ chlorination



## Ujiyawa Hydraulics Laboratory

◆ Established in 1952 in Kyoto Japan ◆ 61,000 m<sup>2</sup>

### ◆ Main Projects

- ◆ Flood flows and river bed change
- ◆ Turbulence characteristics of free surface shear flows
- ◆ Local flow in an open channel
- ◆ Hydraulics in bays and estuaries
- ◆ Measurement techniques for hydraulic phenomena

### ◆ Sample facilities

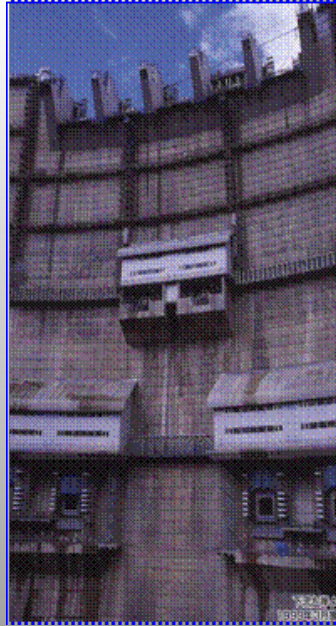
- ◆ Lake Biwa physical model:  $H=1/1500$  ◆  $V=1/100$
- ◆ Osaka Bay physical model:  $H=1/5000$  ◆  $V=1/500$
- ◆ 15 m long sediment channel
- ◆ Wind tunnel
- ◆ 0 m wave basin



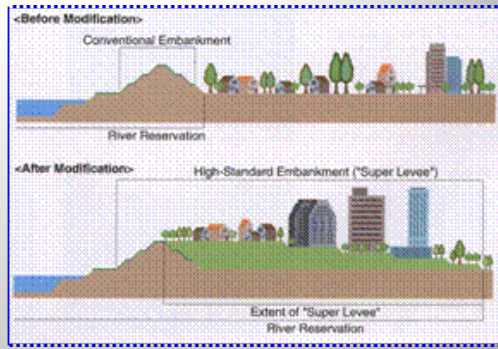


## Nukui Dam and Reservoir

- ◆ Dam location
  - ◆ Town of Kake in Hiroshima Prefecture
  - ◆ In Takiyama River ◆ Ota River basin
- ◆ Purpose
  - ◆ Flood control
  - ◆ River flow regulation
  - ◆ Water supply
  - ◆ Power generation
- ◆ Specification
  - ◆ Concrete arch
  - ◆ Height ◆ 156 m
  - ◆ Crest length ◆ 382 m
  - ◆ Reservoir capacity ◆  $82 \times 10^6 \text{ m}^3$
  - ◆ Catchment area ◆  $253 \text{ km}^2$
- ◆ Village relocation
  - ◆ 1 of 27 households were relocated locally
  - ◆ Government moved entire village







## Arakawa "Super Levee"

A ♦super levee♦ is about thirty times wider than it is tall. ♦ The slope of the embankment is made very gentle so that, in the unlikely event that the river should rise above the embankment, the water would spill gently down the slope, protecting the embankment from destruction and minimizing serious damage to the communities along the river. ♦ The ♦super levee♦ differs from the conventional embankment, which is basically a wall separating communities from the river, in that parks and buildings will be situated on it, giving the towns and developments along the waterside a pleasant uninterrupted view of the river. ♦ This project, proceeding in tandem with the development of towns along the river, will result in communities that are well defended against flood, but which at the same time can enjoy the river and the greenery it offers close by.



Catherine J. Shrier  
June 29, 1999

This paper provides a daily log of meetings held, sites visited, and sights seen during a two-week foreign study program organized by the Iowa Institute of Hydraulic Research (IIHR) at the University of Iowa. This program was held as a 3-credit hour graduate course entitled "International Perspectives in Water Resources Planning in Taiwan and Japan." This log is a partial requirement for the completion of this course.

Saturday, May 22, 1999

Left Denver Airport for Tokyo and Taipei.

Sunday, May 23, 1999

Met most of the other students (Jeff Blank, Nicola Mawer, Owen Kubit, Jennifer Holman-Dodds, and Kevin Nielson from U. of Iowa; Andrew Smith from U. of Kansas; Alicia Urban and Scott Morgan from U. of Minnesota) at the airport in Tokyo prior to boarding the flight to Taipei. We met Dr. Odgaard at the airport in Taipei and, after leaving word of where the airline could bring Kevin's lost luggage, went through customs, and were met by Kenny, a student from National Taiwan University (NTU) who was to act as our interpreter during our time in Taiwan. Other NTU students may have met us also but we were pretty tired from jet-lag. We changed money at the airport and left for the Chien-Tan Overseas Youth Activities Center, arriving late in the evening. We split into rooms (I was sharing a room with Nicola Mawer from U. of Iowa) and went to sleep.

Monday, May 24, 1999

Our first official stop of the course was the Water Resources Bureau of the Ministry of Economic Affairs in Taipei. The presentations began with welcoming remarks by Congressman Hsu, the Director of the Water Resources Bureau. This series of presentations gave us an excellent overview of Taiwan's major water resources concerns, plans, and current and future projects, as well as how the government is organized to support water resources planning and management. It was a very good introduction to Taiwan's water planning, although some of the material was repeated in presentations at other meeting by speakers who were not aware that we had heard this information previously.

We heard a presentation by Dr. Yeh-wen Lu, who graduated from George Washington University, on how the water agencies in Taiwan are divided between the Water Resources Bureau, which does the water planning and is more political, and the Water Resources Department, which implements water plans through the development of water projects, research and monitoring, and through supervision of the regional (provincial) and local (county) water management agencies which are under the supervision of the Water Resources Department. Dr. Lu explained the general principles of the Water Resources Bureau's planning which included development and conservation of water resources, ecological protection, and fair pricing, including compensation for non-use of

water. Objectives included conjunctive use of ground water and surface water, conjunctive use of various water projects within a region, management of ground water resources to prevent land subsidence and saltwater intrusion, river management, and disaster prevention.

Next, the students (including the NTU students), professors, and government officials introduced themselves.

We then heard presentations from Bureau staff on Water Resources Management in Taiwan, the Ground Water Monitoring Network Plan in Taiwan, and The Present and Future of Taiwan's Water Resources Policies. Dr. Chang, a Hydrogeologist, spoke on the development of a Ground Water Monitoring Network and Monitoring Program to track falling groundwater levels. He also discussed the possible use of aquifer storage recovery (ASR) to slow or reverse these water level trends. During one of the later presentations, I spoke with Dr. Chang and with Jimmy Chen, also involved with this project, about the Taiwan's consideration of the use of ASR.

The Water Resources Bureau provided us with lunch, after which we decided to visit the National Palace Museum in place of the softball game against NTU, which may have been rained out anyway.

NOTE: Because the Chinese art that was brought over to Taiwan is so significant, and because the National Palace Museum is so far from the city and would be so difficult for students to get to without access to the charter bus, this visit probably should have been on the schedule, although it is unfortunate that we did not also have time for a softball game with the NTU students. I don't think it was clear to us until late in the week that the NTU students who greeted us the first day were a part of the program, that they would be with us for the whole week, and that we should try to get to know them. Fortunately, we did get to know some of the NTU students by the end of the week, particularly those who joined us for sightseeing on the last day in Taiwan.

That evening, we were guests at a dinner with the board members of Sinotech Engineering Consultants, Inc. and Sinotech's affiliated companies (including a research organization called Sinotech Foundation). Dinner was at the Grand Hotel, behind the Chien-Tan Center. It was Andrew's birthday. We had shark tail soup, among other things.

Tuesday, May 25, 1999

We started the day with a visit to Sinotech, Ltd., which is the engineering firm that built the Feitsui Reservoir (one of the major sources of water supply for Taipei). The Board of Directors for Sinotech Ltd. greeted us with a welcome speech and an explanation of the re-organization of the company. We then heard presentations from two Sinotech employees.

First, a geotechnical engineer gave a presentation on the history and construction of the Feitsui reservoir. The reservoir is only 30 km from Taipei, so there were serious concerns about the potential for a dam break. Construction of the dam was suspended from 1975 until 1977, when the U.S. Bureau of Reclamation did a dam break study for the Feitsui Dam. After some design changes, the construction of the dam continued. To construct this dam, Sinotech developed an innovative approach to dealing with the fractures underlying the dam, power-washing and filling the fractures.

Another engineer then gave us a presentation on the Keelung River straightening project, which is intended to reduce flooding and increase the land area available for housing in

Taipei. She explained the serious problem with population density in Taipei. In preparing for this project, Sinotech studied the potential impact on the Tan-Shui wildlife preserve downstream, and found that the project was likely to improve flows to this important habitat for birds. The American students asked about other potential environmental impacts. She explained that while these considerations were important, Taiwan, unlike the US, was still at a point of development where there were still high losses of human lives due to disasters such as flooding. The river straightening project would address these human safety concerns. The new river also would include green spaces along the banks which could be used for recreation and gardens.

After lunch (provided by Sinotech), we headed to the Feitsui Dam for a presentation and tour of the dam. We saw a video on the dam, and then visited the control room to see how the operators monitored incoming typhoons to determine when to make releases from the dam. Before we headed up to the dam, we learned that the new KMT mayor of Taipei (whose family recently came from China) and deputy mayor were visiting the dam, and we met them and had our pictures taken with them by the Taiwan press. The mayor, who holds a law degree from Harvard, had defeated a popular reformist mayor whose family had been in Taiwan for several generations in a bitter election. His deputy mayor was a civil engineer, educated at Case Western University.

The geotechnical engineer and some of the dam operators then took us up to the dam itself, and then into the dam. We walked down the stairs inside the dam, passing several monitoring stations within the dam, to one of the outfalls, then continued to the bottom of the dam. After all those stairs, we were greatly looking forward to our visit that evening to a restaurant with sulfur hot springs for dinner and a soak in our own private hot tubs.

Wednesday, May 29, 1999

We left early this morning for Taichung, which is where the Water Resources Department and associated research facilities are located. We were met in Taipei by Dr. Tim Lee, a U. of I. graduate, professor at NTU, former director of the Water Resources Department, and one of the organizers of the U. of I. program in Taiwan. Dr. Lee rode down to Taichung with us on the bus, and pointed out for us the levees constructed along the river. We stopped to meet the family of Kuo Sho, a U. of I. electrical engineering student who had come to assist us as an interpreter.

In Taichung, we met the current director (a graduate of Colorado State University) and several of his staff. We saw a video which explained how the government had been reorganized in 1997, with the Taiwan Provincial Government/Water Resources Department overseeing 3 regional bureaus (northern, central, and southern) and 8 river basin bureaus. We heard presentations from various officials on Water Resources Development, River Maintenance, Dike Construction, Irrigation,, and the particular concerns of the Southern Province. The Southern province has the most pronounced seasonal variation in rainfall, with 91% of the rain falling during 3 months of the year, and no good sites for storage facilities aboveground or underground. Consequently, they have worked to coordinate water supply and flood control activities at several projects on a regional basis, linking various small reservoirs with tunnels and pipe systems. Work on a major dam in the southern region has been halted due to public disapproval and demonstrations regarding dam break concerns and potential harm to butterflies in that region. There have also been plans to build reservoirs on the sparsely populated eastern slope to pipe water to the west, but these plans have been slowed by concerns over fish species. The engineers at the Water Resources Department were concerned that science

and engineering was not getting a strong enough voice in water resources planning, e.g. for urban growth in flood plains.

We visited the lab site, and then were taken to a restaurant for lunch with the Water Resources Department staff, and then heard a talk by Dr. Lee on sediment transport problems in Taiwan. Ways in which Taiwan has been working to address sedimentation concerns and other water resources problems include 1) construction of weirs instead of reservoirs; 2) optimization of use of multiple weirs and reservoirs to deliver water to low supply/high demand areas; 3) enforcement of watershed soil conservation practices; and 4) greater use of “non-structural” measures such as the use of flood plain zones and flood warning systems.

Typical current projects run by the Water Resources Department include the Chi Chi Common Water Diversion Project in an area where a dam was needed but sedimentation was too high, so a weir system was used instead. There was also a conjunctive use project in which water from wells and weirs were pumped to an oversized reservoir for storage. The Tanshui River Basin Flood Control Center had developed a decision support system which we would visit later. There were also efforts to increase the amount of green space (parks) in Taipei to allow better drainage of flooding. These and other projects were described on the web site at <http://www.tpgwr.gov.tw>.

The director of the Southern regional water resources department described further the transbasin diversion from the Chi-Shan River to the Nan-Hua reservoir, and the Tsen-wei water diversion plan. He also discussed regional water allocation transfers between different types of water uses, and the discussions between the irrigation associations and industrial users to work towards improving the regional economy while meeting water needs. We then went for dinner and stayed at the dormitory, after visiting a night market.

Thursday, May 27, 1999

We were brought breakfast at the dorms by one of the staff of the Water Resources Department, and then went to the Department's research facilities, where we saw large models of the area's rivers and sediment removal facilities. We then went to lunch.

After lunch, we went to the Chi-Chi Weir site, still under construction. The weir was intended to consolidate water withdrawals for 17 irrigators, and provide water to an industrial area, and to provide recharge water for the ground water aquifers. After the site visit, we went to dinner at a Japanese restaurant, and then took the bus back to Taipei.

Friday, May 28, 1999

We picked up the NTU students, along with breakfast at a store on campus, and then went to the Tan-Shui River Basin Flood Control Center to learn about their prediction capabilities and decision support model, which was developed by Tim Lee and his students. On the way to the Center, Tim Lee pointed out the levees and gates to us. There are still people living inside the levees; if they don't get out after being warned of dam releases they will be flooded inside the levees. The Northern Bureau Deputy Director spoke first about the planning and water projects for the Taipei area, and showed us the major rivers and dams in the region, including the Feitsui dam and the Keelung River straightening project. Dr. Lee then explained the decision support system to us. We had lunch there.

We then went to NTU for a panel discussion with the NTU students. Each of the American students gave a presentation on their research and the schools they attended, and then the NTU students talked about their research. We then had a discussion with

the students and NTU faculty about degree requirements and the importance of interdisciplinary studies and opportunities for internships for engineering students. VC Patel joined us for this discussion, as well as dinner hosted by the NTU students and faculty, at the Hsin-Yi Club.

After dinner we visited an important temple and the Snake Street night market, where we saw a snake's heart cut out while it was still alive. Some of the NTU students came with us.

Saturday, May 29, 1999

Some of the NTU students joined us for our free day. We went to the Chiang Kai Shek Memorial and learned about the three great principles of CKS and Sun Yat Sen. We toured the displays downstairs before watching the changing of the guard. Kuo-Sho answered some of our questions about Taiwan's history. He was a real asset to this program.

We then went to the National Art Museum, National Science Museum, and Botanical gardens, before taking the train to the end of the line to visit Tan-Shui, a beach resort area.

Sunday, May 30, 1999

We left Taipei early to fly to Tokyo, where we met Dr. Nakato at the airport and bought our train tickets for the week. We immediately left for Kyoto by train, and had dinner at "the Matrix", a large outdoor structure that looks like an ocean wave made of metal.

Monday, May 31, 1999

After breakfast in Kyoto, we took a chartered bus to Osaka, where we toured the Murano Water Treatment Plant after a presentation by the Water Treatment Plant staff. Mr. Hayashi explained to us that the plant only provided waster for the Osaka water prefecture, according to law, and was the third largest water treatment plant in the world following plants in Thailand and Los Angeles. Because of the high levels of nitrogen flowing in from Kyoto, the plant used a biological treatment process. The plant was located at the juncture of three rivers. We then toured the plant.

We went to the tallest building in Osaka for lunch before heading upstairs to the office of the Osaka Ports and Harbors Bureau. Osaka is a major port city, and is vying for selection as an Olympic site. The bureau is creating artificial islands for waste disposal, and has made several modifications to the delta for better port facilities and the capacity to handle larger cargo loads and larger passenger vessels (e.g. the QE II). They are also trying to build a waterfront area for tourism, similar to Baltimore and other major coastal cities in the US. They are also building a "Sports Island," another artificial island to be used for sports facilities (hopefully in conjunction with the Olympics). We then went on a boat tour around Osaka Bay, and saw the world's largest suspension bridge and Kobe, the site of the earthquake. After the cruise, we went to the Aquarium, and then had dinner with Dr. Imamoto and some Ph.D. students.

Tuesday, June 1, 1999

We took the chartered bus to the headquarters of Kyocera, a large ceramics firm in Kyoto. Kyocera has a public art exhibit, including several Picassos, as well as an interactive exhibit on the development and uses of fine ceramics (e.g. for semiconductors). In the bathrooms, they had "ecofriendly" hand-dryers that quickly dried

your hands on both sides at once, with no towels necessary.

We then went to the Disaster Prevention Research Institute for a presentation on the Institute's studies in the Lake Biwa region. In particular, we learned about their research on remote sensing to predict changing lake conditions and water levels. Lake Biwa is Japan's largest natural lake, and provides headwaters for one of the rivers that provides water supply for the Osaka region. Flood control on this lake and river system is also a major concern. After the presentations, we toured the facilities, which include several large, new, but mostly empty warehouse lab facilities (other than a model of Lake Biwa). The lab buildings were constructed with funds from the government after the old labs were torn down to make way for highway construction.

We then went up into the mountains and were able to see Lake Biwa before visiting the Enryaku-Ji Temple. We then returned to the city, visited an outdoor market, and went to a restaurant for a reception with the students and faculty affiliated with DPRI. After the reception and dinner at the restaurant, a few of us joined Professor Imamoto, a couple of other faculty, and a student named Kenji at a sake house, to celebrate Kenji's birthday.

Wednesday, June 2, 1999

We checked out of the room early the next morning and headed to Hiroshima, where we were met at the station by Professor Fukuoka (and Iowa alumnus) and some of his students. They brought us to the university and gave us a room to leave our things before seeing the student offices and visiting the Dean of Engineering. We then returned to the Civil Engineering Department for seminars (where we were joined by Professor Fukuoka's students). The seminars were presented by Hideaki Fujiyama of the Ministry of Construction on Flood Control and Water Resources Development on the Ohta River, and by Professor Fukuoka on the use of reeds for these flood control efforts.

We had a very American lunch (Salisbury Steak) with some professors, the Dean of Engineering, and some of the international students in the Civil Engineering Department, including students from Costa Rica, Bangladesh, and Tanzania. We also met the only female civil engineering professor, Dr. Toshiko Yamaguchi.

After lunch, we had a tour of Dr. Fukuoka's labs, with several demonstrations of on-going experiments to study how water flows and sediment is transported under various flood conditions. The students demonstrated their experiments, and also showed us a video and presented us with a book of abstracts of their work (their first abstracts in English). We then had a panel discussion with the students in which we each presented on our research as we had for Odgaard and the Taiwanese students. The Japanese student had a much more interesting presentation, and it would have been very interesting if we had had the same outline to work from and could have addressed the same topics. They talked about how they were admitted to their program and how they got funding, and how they interacted with the advisors and other students. We also set fire (accidentally) to one of the extension cords during the presentation.

We then had a barbecue outside with the students and professors. Several of the undergraduates joined us as well, including all six female undergraduate students (there are currently no female graduate students). I ended up talking with five of the women students, and had a conversation with Professor Yamaguchi and three of the students about pursuing graduate research and balancing work or school with family and why so few women enter engineering and how women engineers can support one another. The students and Professor Yamaguchi talked about starting a group for women engineers, and networking with women working in engineering firms and agencies, and supporting

each other in their studies.

Thursday, June 3, 1999

We went to a site visit to the Nukui Dam, still under construction. It was good to get out of the industrial centers and large cities (Osaka, Kyoto, Tokyo) and see more of the countryside. We went to the construction company's local headquarters first and heard a presentation on the dam before heading to the dam site. The dam hasn't been filled yet. We were able to go to the tunnel under the dam to see where they were studying a fault. (Our visit was later written up in the company newsletter.) We had lunch at a building that was used first as housing for the construction engineers, but was ultimately designed to be a resort for the "lake" that would form when the reservoir was filled. The resort was part of the effort to rejuvenate the economy in the vicinity of the dam, as an incentive for siting the dam in that area. We also saw the mansions that were built for the people who were displaced by the dam construction.

We then went to the Hiroshima Memorial Peace Park. We saw several of the monuments around the Park before taking a boat cruise on the Ohta River, and then visited the museum itself. There are more than 100 monuments around the Park, erected by various organizations in memory of various victims of the bomb, including several for Koreans forced to work in Hiroshima during the war. The most impressive part of the museum itself was the videotaped stories by the survivors of their experiences during and immediately after the blast. Unfortunately, the videos were the last exhibit and I didn't have time to see more than two of them before we had to leave. Afterwards, we took the train to Tokyo.

Friday, June 5, 1999

This was the last official day of the program and the only one in Tokyo. We met with the Director of the Ministry of Construction River Bureau for 15 minutes at his office. After hearing our questions, however, the Director was kind enough to join us before the presentations by the staff to speak to us in greater detail about public participation and environmental considerations, and the River Basin Councils that have been formed to get local input on projects. He spoke very openly and frankly about things not normally discussed with outsiders.

After the Director left, we heard presentations on construction projects by Kazunori Wada, Director of the Japan Institute of Construction Engineering (JICE) Water Resources Division, with Professor Fukuoka acting as translator again. Then, Shoshi Yokotsuka gave us an excellent presentation (in English in Power Point) on issues in Japan's water resources planning. Shoshi stayed with us during the box lunch, and afterwards asked me several questions about dam construction in the United States and why the US built so many large dams and then stopped. I intend to send him a copy of Cadillac Desert.

We then went for a boat tour of the Ara River with the head of construction and other Ministry of Construction staff. The Ara had both a natural channel and a constructed channel – the flow is diverted to one or the other depending upon flood conditions. The constructed channel is made to meander like a real stream. We saw the flood gates, which divert floods to the constructed channel to prevent flooding in the more populated and developed areas. We also got off the boat to see an old-style levee and a "super-levee" which has a more gradual slope on both sides (1:15 slope on one side and a 1:30 slope on the other). We went down the real river channel and back up the constructed river channel before disembarking to visit the MOC headquarters and children's exhibit,



and then heading to our farewell dinner.

Saturday, June 5, 1999 and Sunday, June 6, 1999

This was our “free day” in Japan. We first all went to the Emperor’s Palace, and were able to visit the gardens and museum on the grounds (the palace itself is closed to the public) while Professor Nakato bought baseball tickets for me, Andrew, Jeff, and Nicola. We then went for lunch near the electronics district before doing a little shopping for souvenirs and checking out cameras. We then went to a large temple and saw a couple of weddings in progress. Finally, we went split up for the evening and five of us went to the baseball stadium for the game (which was right next to the rugby stadium). The next day (after meeting Professor Nakato’s family at the airport).

# Diary: Taiwan and Japan

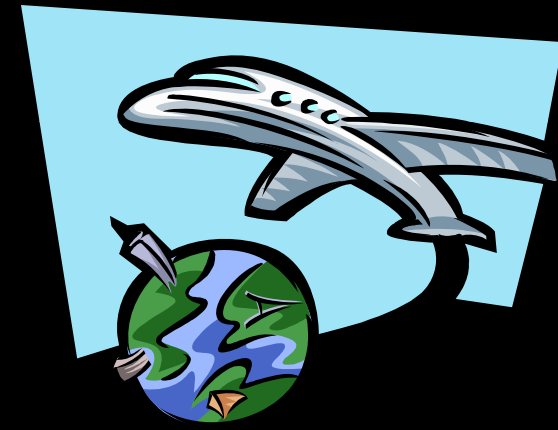
**By Jeff Blank**



# Day 1: Iowa City to Taipei City

Saturday 5:15 AM

- Woke up Iowa City, picked up Owen and Nicola and headed to Cedar Rapids Airport
- Flew to Chicago → Not too exciting
- Meet Andrew, Scott and Alicia at O'hare
- Got on plane for Tokyo (747-400) totally full. The man next to me told me he was involved with the tropical rainfall radar project (Krajewski)
- Landed at Tokyo Narita and meet the final student, Cat Shrier.
- Left Japan and flew to Taipei City, Taiwan
- After gathering luggage and going through customs, we met a group of National Taiwan University Students who drove us to our hotel in Taipei City.
- Paired up with Andrew Smith from the University of Kansas and went to sleep.
- Total time awake → 34 hours



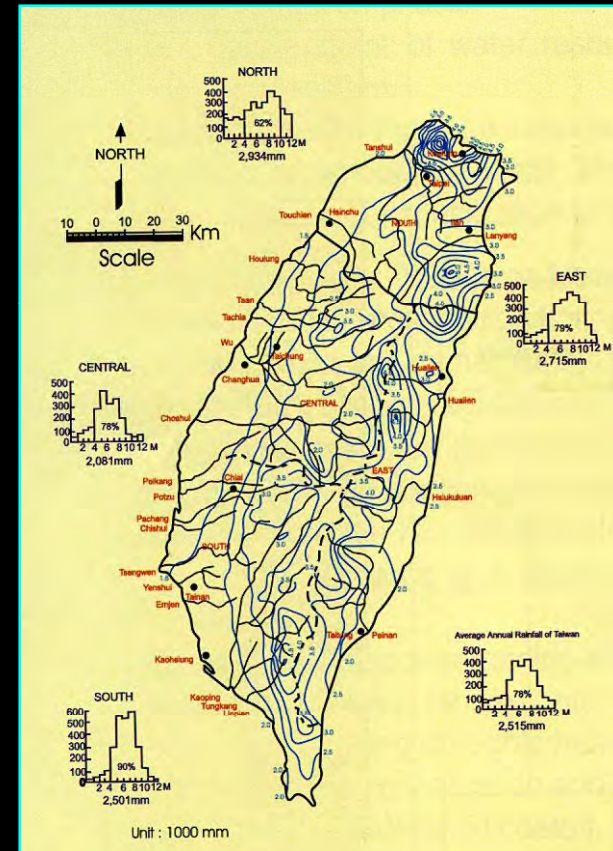
# Day 1: Traffic and People

- My first impression of Taiwan: so many scooters! I have never seen such traffic.
- I saw three people riding on a single (one-man) scooter.
- Also lots of crowding



# Day 2: Water Resources Bureau

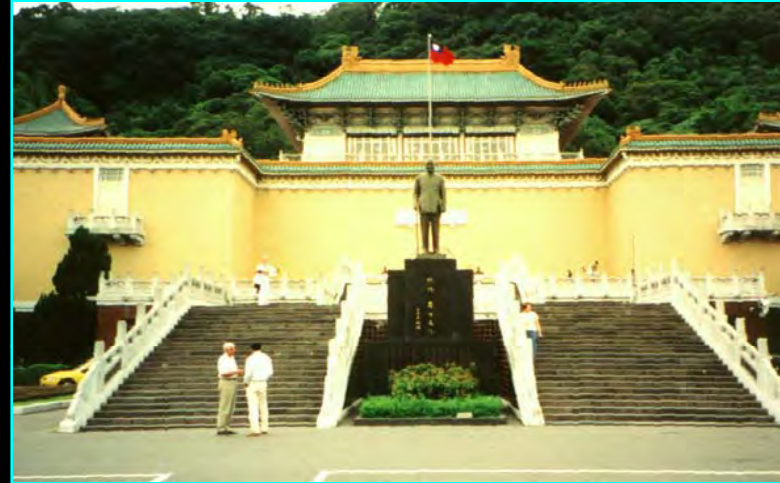
- Woke up really early – 3:30 am.
- The group took a bus to National Taiwan University (NTU) where we dropped off the professors. The students continued on to the Taiwan Water Resources Bureau
- The Taiwan Water Resources Bureau is the overseer of all water resource projects in the country.
- We first had the pleasure to meet Director General Hsu who spoke briefly about the general water resources issues present in Taiwan
- This was followed by a number of short presentation which highlighted the challenging complexities present in Taiwan hydrology and hydrometeorology
- Finished the meeting with a discussion between us, the Water Resources bureau officials and the NTU students





# Day 2: Taiwan National Museum

- Following a quite animated discussion between myself and Kevin over playing softball or going to a museum, we made our way to the Taiwan National Museum
- I don't regret going to the museum because it was very nice, however I would have enjoyed playing softball and getting to know more of the NTU students.
- The museum was very nice. There was some absolutely incredible works in ivory as well as numerous other extremely old antiquities.
- I was impressed with the architecture and the gardens surrounding the museum. It was very beautiful.



# Day 2: Banquet at the Grand Hotel

- The final event of busy day number 2 was a banquet sponsored by Sinotech Engineering at the Grand Hotel.
- The Grant Hotel was only about a 1/2 mile from our hotel so the group walked together.
- The architecture of the hotel is breath-taking. I had always pictured ancient china to look like this, but not present day.
- At the banquet, we were met by the Board of Directors of Sinotech Engineering who joined us for dinner.
- I had the pleasure of chatting with one of the vice presidents who said told me he had graduated from the University of Texas. He also told me the the vast majority of Taiwanese engineers have their degree from a US institution. I was surprised.
- Everyone was very nice and I had a great time
- The banquet was our real first experience to Asian food. I ate a bit of everything, however sometimes it was a bit unnerving





# Day 3: Sinotech (Fetsui Reservoir)

- The second full day in Taiwan began at the headquarters of Sinotech Engineering located in Taipei City
- Again, we met with the Board of Directors who joined us as we listen to two presentation on some of there more impressive projects
  - Fetsui Dam & Rervoir
  - Keelung River Rehabilitation
- In the afternoon, the group went up to Fetsui Reservoir which is located only about 25 km upstream from downtown Taipei City.
- Learned that the dam was designed solely on the basis of water supply and that it is not at all used for recreation.
- This differs from most anything I know in the United States



# Day 3: Fetsui Reservoir Con't

- The group got a chance to actually take a tour inside of the Dam. It was very 1970's, no elevators, and we had to take a spiral staircase down about 45 meters. I actually got quite dizzy.
- Learned that the dam and reservoir have to actually catch rain depths of upwards of one or two meters in a day. I am beginning to appreciate why water resource engineering is so challenging in Taiwan
- The group was lucky enough to meet the Mayor of Taipei City who happened to be touring the dam facilities also.
- I learn that the Mayor got his education at Harvard University where my brother is in College and the Vice Mayor got his education at Case Western Reserve University in Cleveland, where both of my parents went to school. Kind of a small world.



# Day 3: Dinner above Taipei City

- We decided to have dinner at the top of one of the mountains surrounding Taipei City.
- Our bus took a wrong turn along the way up the mountain and we ended up on gravel road that was skirting along the edges of some extremely sheer cliffs
- At dinner, we order a large variety of native Taiwanese foods. One of these was chicken soup. As I was filling my bowl, I noticed that when one orders chicken soup in Taiwan, one gets the 'whole' chicken. I was starrng at a chickens foots. My first reaction was laughter, then disgust, and finally back to laughter when I watched one of the local Taiwanese grab it and start to chew
- After Dinner, we paid a few dollars and relaxed in the natural hot-springs. It was very nice!



# Day 4: Provincial Water Resources Bureau - Taichung

- We took our bus from Taipei City to Taichung (about 2 hours southwest) where we were met by the Taiwan Provincial Water Resources Bureau (WRDTPG).
- Listened to a nice presentation from Dr. Lee (a previous IIHR graduate) about the provincial government's role in Water Resources.
- We also learned of the Taiwanese environmental movement which has only recently become active. A dam and reservoir scheduled to be built in the southern region of Taiwan has been protested and blocked over saving butterfly's
- Also learned about Dr. Lee's research in estimating rainfall and predicting reservoir operations
- Finished the Day with a banquet at the Lotus Garden Hotel.
- We learned a saying in Taiwanese '*Kompei*' – which means bottoms up. I really enjoyed talking to the WRDTPG staff and made some good friends. Also consumed more than my share of Taiwan Beer
- Our accommodations in Taichung were provided by the WRDTPG and were very nice (except for the wood plank used as a bed .. Oh well, I was very tired and didn't notice after about 5 minutes)





# Day 5: Chi-Chi Weir

- Our 5<sup>th</sup> day began by touring the Provincial Water Resource Bureau's Hydraulics Laboratories. They were similar to our facilities except most of their work was done outside
- We had another small banquet for lunch and then travel to the Chi-Chi 'g-g' Weir.
- The weir is similar in size to the dams along the Mississippi, however it has a much different function.
- The weir is design to function as a sedimentation basin whereby sediment free water is bypassed and channel down to the neighboring industries.
- The name Chi-Chi Weir was used rather the Chi-Chi Reservoir because it was thought that naming the facility a dam and reservoir would bring environmental activism and protesting along with it.
- It was rainy, so couldn't see to much.



# Day 5: Banquet – back to Taipei City

- After visiting the Chi-Chi weir, the group again met with the staff of the WRDTPG for a banquet.
- The dinner was at a Japanese restaurant where we all (about 20 people) ate at a large circular table.
- Again, I experienced some new Asian foods like octopus and jelly-fish tentacles, along with my first taste of Sake.
- The Director of the WRDTPG, a small short gentleman, initiated what I would call a drinking contest where he went around the table and quizzed us on the day's tour of the Chi-Chi weir. If you answered the question correct, he had a glass of sake, if not, both you and he did.
- The nice gentlemen had quite a lot to drink. I think everyone else had a bit too. It was fun
- After Dinner, we drove back to Taipei City.
- While everyone else slept, Dr. Krajewski and I had a nice discussion about teaching engineering. I learned a lot. We also talked about Judo and Soccer. I'll have to play him sometime – and win of course.



# Day 6: Flood Prevention Bureau & Night Market

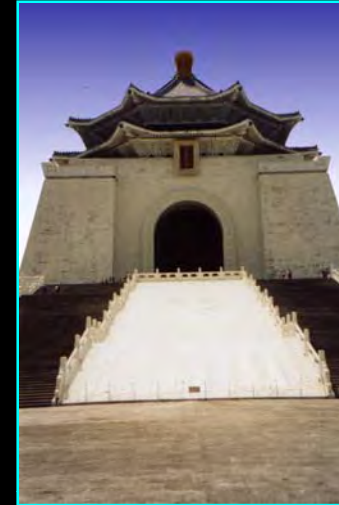
- Visited the Flood Prevention Bureau where we learned about controlling and preventing the flooding in downtown Taipei City.
- Learned that from the time it rains, to the time the flood reaches downtown Taipei City can be as short as 2 to 3 hours.
- Had our final Taiwanese banquet. It was a Mongolian Barbeque. Mmmmmmm.
- Visited the Night Market (also called 'Snake Alley'). We saw vendor's who offered fresh snake blood as an aphrodisiac. (We watched the entire process, however no one in the group was willing to sample.)
- Night Market was very busy. One could buy just about anything at the night market.
- Took a wild taxi ride back to our hotel. I actually saw a car stuck straddling a concrete median. It was funny, but not surprising considering the driving.





# Day 7: Touring Taipei City

- On our last full day in Taiwan, we visited the main tourist attractions in Taipei City
  - Shang-Kei Shek Memorial
  - National Science Museum
  - National Art Museum
  - McDonald's
- Visited a number of Different Temples



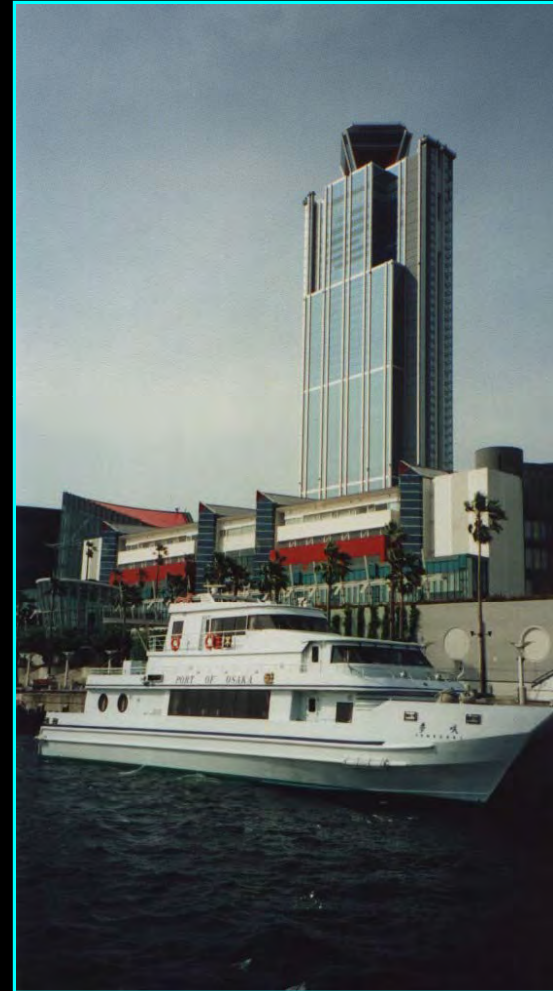
# Day 8: Taiwan to Japan

- Took a bus to Taipei City airport. Owen left one of his bags in the bus and he lost it. (He actually got it back about three months later.)
- Arrive at Tokyo Narita, pass through customs and meet Dr. Nakato.
- He seems very happy to see that we made it safely and is anxious to get going and show us his country.
- We take the 'Narita Express' from the airport to Tokyo station where we switch trains and jump on the Shinkansen (bullet train) headed for Kyoto.
- The high-speed trains remind me a lot of France and the TGV – very efficient and timely.
- Arrive in Kyoto, drop off luggage at hotel and go to 'The Cube' for dinner. We ate at a typical Japanese restaurant except instead of ordering, we had to walk outside and point to the display foods to order. Oh well, I still got to eat.
- Learned that Kyoto has about 3.5 million people. It doesn't feel that big



# Day 9: Osaka Prefecture

- Began tour of Osaka by visiting the world's third largest water-treatment plant. (Dr. Paulson would love this place)
- Our next stop was downtown Osaka. We stopped for a few hours at Japan's World's Trade Center. We ate a McDonald's and then took the express elevator to the top floor (86<sup>th</sup> floor)
- The view from the top of the building was very good even though there was quite a bit of smog. I could see the long suspension bridge, Kansai Airport, and the rest of downtown Osaka and Kobe.



# Day 9: Osaka Port Facilities

- After lunch, the group was taken to the 45<sup>th</sup> floor of the World Trade Center to meet with the Osaka Harbor Authority.
- The conference room was amazing. We had an absolutely beautiful view of the Osaka port facilities.
- We had a short discussion about the activities currently being done on the port. They included:
  - Land reclamation for the 2008 Olympics
  - The worlds longest suspension bridge
  - Kansai International Island Airport
  - The Kobe Earthquake
  - Upgrades to the docking Facilities
- After the presentations, we took the Port Authorities Yacht on a two hour cruise around the bay.
- We saw what was left of the Kobe earthquake, the suspension bridge, and many other interesting coastal projects.
- After the cruise, we had a tour of the Osaka Aquarium.
- Finally, we ended the day by having a small banquet style dinner with Dr. Nakato, Dr. Iwasa, and a small group of students from Kyoto Universities Hydraulic Department.



# Day 10: Kyocera

- Our third day in Japan began by touring around the headquarters of Kyocera (the world's largest producer of ceramics)
- We got a chance to walk through time by touring their museum and see how technology (especially ceramics) have evolved over the past 50 or so years.
- Some of Japan's newest ceramic technology was also displayed: A ceramic gas turbine engine, audio and video cell-phones, and photo-electric solar power collector to name a few
- We also visited the Kyocera art gallery which had a large number of works by Picasso
- Overall, I got the impression that Kyocera was a very high-tech manufacturer and has always been on the cutting edge of technology. It was also fun to play with all the newest high-tech toys.





# Day 10: Kyoto University Hydraulics Laboratories

- Our next stop was Kyoto Universities Hydraulics Laboratories.
- I was absolutely amazed by the facilities. I could imagine visiting professors drooling over the the vastness of all the equipment and buildings.
- The story is that the Japanese Government decided to build a super-highway through the old laboratory, and as a replacement, they rebuilt the entire complex at a cost of around 100 million dollars (Can't we be so lucky with Melrose Av. and IIHR)
- Dr. Imamoto, the past director of DPRI, gave us a talk and tour about there projects and facilities. They include:
  - Modeling Lake Biwa, the largest freshwater lake in Japan
  - Sediment Transport (flume  $\sim 100\text{m} \times 10\text{m} \times 4\text{m}$ )
  - Runoff modeling of basin using modeled rainfall
  - Etc ...



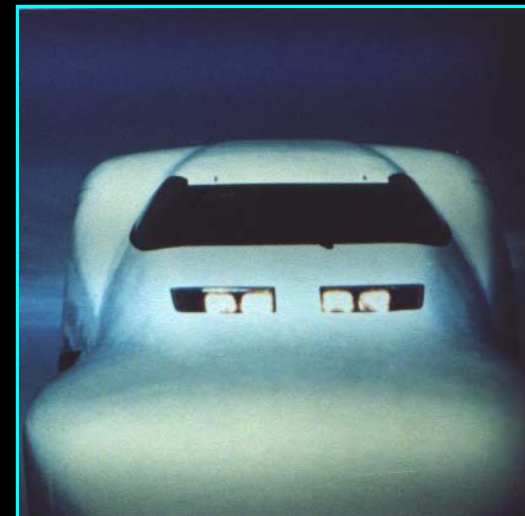
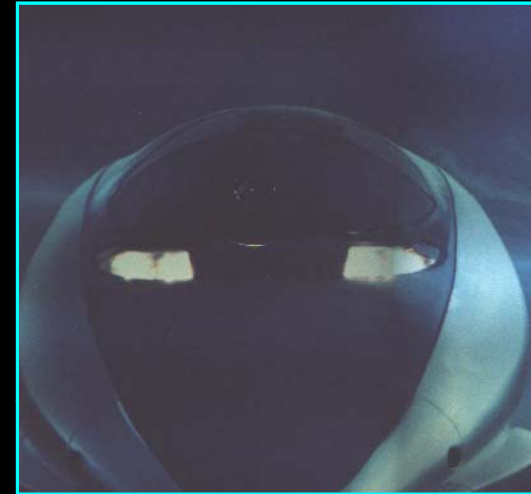
# Day 10: Lake Biwa Area

- Lake Biwa is the largest freshwater lake in Japan. It is located in central Shiga Prefecture (near Kyoto)
- Drove around much of the lake and then began an ascent up to the top of the neighboring mountains (Mt. Hiei)
- At the top was a large Buddhist Temple call 'Enryakuji'. The temple was about 1200 years old. We all got a chance to ring the sacred bell using a large swinging pole. It was just how I had pictured Japan.
- After leaving the Lake Biwa area, we went back to Kyoto where we had a banquet with the Kyoto University students and professors.
- Following the party, myself, Scott, Andrew and Cat went with Dr. Imamoto and a few of his students to a formal Tatami bar (sit on floor bar).
- It was a neat experience. There was a slight language barrier, however we all still seemed to joke and laugh and talk about the difference between the United States and Japan



# Day 11: Hiroshima University – Dr. Fukuoka

- We awoke and, a bit late, and rushed to the train station to catch the Shinkansen to Hiroshima.
- When we arrived, we were greeted by Dr. Fukuoka and a few of his students who drove us the Hiroshima University.
- During our short ride from the train station to campus, I was told that Dr. Fukuoka was the most difficult professor in all of the department of engineering and that he preached the teaching methods and styles of Prof. Rouse (IIHR).
- Upon arriving at the University, we listened to two seminars on the water resources of the Otha River in Hiroshima. One final presentation was given by Dr. Fukuoka about compound open channel flow roughness using natural reeds.
- We then met the Dean of the College of Engineering and ate a Japanese style lunch box.





# Day 11: Hydraulics lab facilities

- Immediately following lunch, the group had a tour of Dr. Fukuoka's laboratory facilities.
- The research that was presently being done was very simple in terms of hydraulic modeling, however the ideas were quite interesting.
- I particularly enjoyed learning about the compound open channel thalweg meandering seen during flood flows
- After visiting the civil engineering hydraulics facilities, we visited the mechanical ship hydrodynamics labs.
- Hiroshima University's ship towing tank is much nicer than IIHR's. We got a chance to ride along on the gantry.
- We also got a chance to see a student designed bicycle powered hydrofoil. I thought that would be a great project for students at IIHR to do. Between our mechanical ship group and our more hands on civil students, we could design a very good pedal powered hydro-foil.



# Day 11: Panel Discussion

- After lunch, we all gathered in one of the large lecture halls on campus and had a panel discussion concerning our education system and that present in Japanese Universities.
- I was the mediator and tried to do my best keeping the conversation lively without dwelling too long on topics that would be difficult for the Japanese students to understand.
- We began by each presenting briefly our research and then turned over the floor to the Japanese student who discussed the life of a Graduate Student.
- I found it quite interesting that all graduate classes are offered in English.
- Overall, however, I found out that no matter where one is as a graduate student, the work and research tends to be very similar

# Day 11: The Barbeque

- Following our panel discussion, we all gather outside of the engineering building and had a barbeque.
- There were probably about 200 people total who attend, ranging from civil and mechanical faculty to undergraduate engineering students.
- It was a great way to meet our equivalents from Japan and get a chance to talk about anything from Large Eddies CFD simulations to Japanese baseball.
- I also got to practice using my chopsticks with no plate under me. I have to say that the mice and squirrels in Hiroshima were fed quite nicely that day.
- After the barbeque, our group thanked our hosts for the excellent hospitality and headed to our hotel to sleep



# Day 12: Nukui Dam

- After an early wake-up call, our group drove about an hour inland to Nukui Dam. We had a quick presentation listing the facts of the project, then we headed up for a tour.
- Our tour took us deep into the heart of the dam, but unlike Fetsui Reservoir in Taiwan, an elevator was used rather than 45 meters of spiraling staircase.
- The dam was still under construction, so the reservoir was empty. This was nice because it gave a nice perspective on the sheer size of the facility.
- The entire facility was to be operable by 2000.
- Again, like Fetsui Reservoir, Nukui Dam was a 120 meter double curvature arch dam.
- We got a chance to see how the Japanese government treats those people who were displaced from their homes during the construction of the dam. Their new homes were very nice.
- We ate lunch at a small restaurant just above the dam and then made our way back to Hiroshima City.



# Day 12: Hiroshima Peace Park

- After taking a short cruise down the Ohta river, we spent the next two hours touring around the Atomic Bomb Peace Park.
- This was probably the most humbling experience of the trip.
- We saw the only remaining building which survived the devastation of the bombing. It was unbelievable how one small bomb could utterly destroy an entire city. The models inside of the museum showed a before and after look and the devastation. It was total destruction.
- It's sad that so many people had to die, but in hind sight, maybe it ultimately did save lives. Who knows?
- Also in the museum, we saw the shadow of a man who died in the explosion. His shadow had been burned into a concrete wall. It was very very humbling.
- I am happy I got a chance to visit the peace park. I feel like it opened my eyes to some real facts of life.





# Day 13: Hiroshima to Tokyo

- We finished our visit to Hiroshima by running over to the old castle and snapping a few pictures.
- Our group along with Dr. Fukuoka left on the bullet train, headed to Tokyo.
- We arrived late on day 12 in Tokyo and had the wildest ride from the Tokyo train station to our hotel. I think I saw the speedometer pass the 140 km barrier.
- Our driver then promptly back his taxi right up to the front door (close enough to have the remote sensor activate and open the sliding doors) and crashed into a guard rail. It didn't seem to bother him. He just laughed, and drove off.



# Day 14: Tokyo – Ministry of Construction River Bureau

- Began by visiting the Ministry of Construction River Bureau where we learned about water resources in the Tokyo Area
- By this time I could see everyone getting pretty tired. I think most of us were ready to get back to the states and relax. Oh well, I guess that not unexpected for a two week long trip.
- After a short lunch, the group took a cruise around Tokyo Harbor and the Arakawa river. This was fun. We got a chance to see a lot of interesting ships and buildings along the river as well as Tokyo's "Super-Dike's"
- The "Super-Dike's" are large (tall and wide) dikes that were built in order to protect Tokyo from flooding.
- Basically, Tokyo can not afford a flood so they are in the process of building the large Dikes.
- Including the reconstruction of the buildings on top of the dike, the total cost per meter of dike is about 1 million U.S. dollars. (\$\$\$\$\$)





# Day 15: Tokyo Sightseeing

- Day 15 was our final day in Japan and the final overall day of our trip.
- We began by visiting the Emperor's Palace where we wandered around the gardens.
- While we were at the palace, Dr. Nakato took the subway across Tokyo to get baseball tickets to the Hanshin Tigers.
- After visiting the palace, we all met and took the subway to the biggest Best Buy I've ever seen. There were store after store and floor after floor of electronics. I think that probably every possible piece of electronic equipment was here. It was cool, but expensive. (I spend almost 1,000 \$)
- After the electronics market, the group took the subway back across Tokyo to visit a large temple.



# Day 15: Baseball – Japanese Style

- I guess it was fitting to go to a baseball game the last day in Japan. I was expecting this to be a good re-acclimation for the United States, but I was sure in for a surprise.
- The stadium was small, It was about the size of a college stadium in the US, however it was entirely full.
- I have never seen people sing and chant for such a long time. Usually in a US baseball game, between the 3<sup>rd</sup> and 7<sup>th</sup> innings, most people just sit quietly waiting for someone to score or better yet hit a home run. For the entire game, the Japanese fans cheered for their team.
- My last official Japanese meal was at the baseball game where I had a sushi box.
- After the game, we all went back to our rooms, packed our bags and got ready to go home.



# Day 16: Japan to USA

- Well, this is the end of our adventure. I call it an adventure because just about everything I experienced was new. I had an absolutely brilliant time and I would definitely participate again if given the chance.
- Well, our group made our way to Narita airport where we jumped on a United 747-400 and flew the final 12 hours back to Chicago.
- At Chicago, we said our goodbyes to the group members who were not headed back to Iowa and jumped on a plane to Cedar Rapids.
- At Cedar Rapids, my roommate meet me with fresh SUBWAY submarine sandwiches, which I had been craving for about the last two weeks.
- **THE END**

