

# CIVIL TALK

The Annual Newsletter of the Civil & Environmental Engineering Department  
Brigham Young University - Summer 2003



It is a pleasure to greet you and give you an update of the progress and happenings in the Civil & Environmental Engineering

Department. We hope that the past year has been a healthy and prosperous one for you, and that you are looking forward to the opportunities and challenges of the coming year as we are for the approaching new academic year. Several accomplishments of our faculty and students from last year are noted in the articles within this newsletter.

First and foremost we are very happy to report that our ABET Accreditation visit last October went extremely well. We are fully accredited for another six years. Our evaluation team was very impressed with the department and the college and gave us many complimentary remarks. The department review contained no negative nor questionable marks. Every one of our faculty members contributed to the successful effort by compiling and submitting assessment materials including exams, home and lab work, class notes, course attributes and evaluations, and student feedback. We are also grateful for alumni help in the form of survey results and advisory committees. I'm appreciative and pleased with this exceptional support.

We have had a few changes in our faculty this past year. Dr. Olani Durrant retired last May after some

30 years working in the department and college including several years as Department Chair & Associate Dean. Also Dr. Les Youd will be retiring at the end of Fall semester. Les has been with the department for 19 years, serving as Department Chair for 6 years, and establishing himself as a world-class earthquake engineering researcher. We sincerely appreciate Olani's and Les's great service and contributions. Grant Shultz will be joining the faculty this fall after graduating from Texas A&M University with a Ph.D. in transportation engineering. We look forward to Grant's contributions in teaching and research. Dr. Glen Thurgood has been on disability leave during this past year and will continue this leave next year. We pray for an improvement in Glen's health and wish him and his family peace and comfort. It's an honor for me to work with our outstanding faculty.

During the past few years we've reported that our ASCE Student Chapter has again and again been a Ridgeway Award finalist. This year they weren't just another finalist - they were the finalist. Yes, the students won the Ridgeway Award as the nations best student chapter. That's 4 Ridgeway Awards in the past 16 years, or being No. 1 on an average of every 4th year. Not too bad. Congratulations to our outstanding students, to the student chapter officers, and to their advisor, Dr. Brett Borup. Service and activity are the hallmarks of our student chapter. We're very proud of our students who are academically strong, work hard to prepare themselves for successful careers, and are loyal to the high standards of ethics and spirituality traditional of BYU.

Finally, we want to thank the Scholarship Society for their diligent efforts in helping the department raise money for student scholarships. We especially want to thank all of you alumni who have graciously contributed. The students and faculty express our heartfelt gratitude for your donations, some small and some large, and all sincerely appreciated. We have been able to financially assist many undergraduate students who are not eligible for university scholarships (many of you know about that). We have also helped many graduate students as there are no university graduate scholarships. One hundred percent of your contributions go directly for scholarships. The matching program of the last 2 years has been extended to December 31, 2003, and may be extended for 2004. There are always more students with financial needs than available funding. We promise to use your contributions efficiently and wisely.

You should know that we welcome your suggestions and advice with regard to our department curriculum and direction. We truly want to have the most effective, progressive, and successful civil engineering program. We would very much appreciate your academic and engineering practice contributions, along with your scholarship contributions.

We would like to hear from you, or better yet, to see you. Let us know about your professional, community, church, and family experiences and opportunities. We'll see you at our annual fish fry on October 10th at BYU Homecoming (see page 7). Have a great year!  
Sincerely,  
Wood Miller

# Farewell to Faculty

---

On April 30, 2003, **Dr. S. Olani Durrant** retired as a full time professor after over 30 years of service. Dr. Durrant received his Bachelors of Engineering Science (1962) and Masters (1963) degrees from Brigham Young University and received his Sc.D. (1969) degree from New Mexico State University.

Dr. Durrant served as an Instructor at BYU from September 1963 - May 1965 and then worked for Boeing for two years before going to New Mexico to pursue his education. After receiving his Sc.D., Dr. Durrant returned to Utah and worked for Hercules Inc. until he was hired as an Assistant Professor and started teaching in September 1970. Dr. Durrant has taught at BYU for over 30 years and has done an exceptional job winning the Outstanding College Teacher Award (1987) and the Karl G. Maeser Distinguished Teaching Award (1988). Dr. Durrant was asked to become the Vice President of Academics at BYU-Hawaii and served there from 1994 - 2000. He returned to BYU and taught for three more years before retiring. He will continue to run the high school bridge contest for the next three years.

Dr. Durrant has served in many different positions at the University including being on the Graduate Council, University Scholarship Committee, Ad Hoc Committee on University



*S. Olani Durrant*

Athletics, Associate Dean of the College of Engineering & Technology, and Civil Engineering Department Chair. He has also served the community as a Member of the Utah State House of Representatives and has been a part of the local community Planning Commission.

On December 31, 2003, **Dr. T. Leslie Youd** will retire as a full time professor after 19 years of service. Dr. Youd received his Bachelors degree (1964) from BYU and his Ph.D. (1967) from Iowa State University. He also did Postdoctoral studies at Imperial College in London (1975-76). After graduating from Iowa State Dr. Youd worked at the US Geological Survey in California until 1984 when he moved to Utah to become a Associate Professor at BYU. He has taught at BYU for 19 years and has done an exceedingly good job winning the Utah Engineering Educator of the Year Award (1985) and the Karl G. Maeser Research and Creative Arts Award

(1991). In 2002 Dr. Youd was awarded the H. Bolton Seed Medal which is an elite award given to eminent international authorities in either general geotechnical engineering or specialists geotechnical earthquake engineering.

Dr. Youd has served in many different positions on and off campus. At the University he has served as a member of the Department Graduate Committee, was a member of the Department Committee on



*T. Leslie Youd*

Honors and Advancement in Rank, and served as the Civil Engineering Department Chair for six years. Off campus he has been the Chairman of the Utah Seismic Safety Commission, member of the Utah Seismic Safety Commission Geoscience Committee, and was on the editorial board for the international journal, Engineering Geology.

Both Dr. Youd and Dr. Durrant have given many years of service and will be sorely missed by the department and the students.

# Introducing Dr. Grant G. Shultz

This coming Winter Semester 2004, Grant Shultz will join the Civil and Environmental faculty at Brigham Young University. Grant grew up on a farm just outside the small town of Champion, Alberta, Canada. He attended County Central High School in Vulcan, Alberta and graduated with Honors in 1987. Grant is the youngest of four children and the only one in his family to reside outside of his native Canada.

After graduating from high school, Grant began his studies at Brigham Young University in the fall of 1987. He took time off in 1989 and 1990 to serve a full-time mission in the California Anaheim Mission where he served with the Korean community. Grant received his Bachelor of Science degree in Civil Engineering in April 1994 from BYU and his Master of Science degree in Civil Engineering in April 1995, also from BYU.

During Grant's time at BYU, he returned home in the summers to work at the family farm and construction company. During the summer of 1992, Grant returned to Canada for a typical summer and returned to BYU the following September with his wife, Karen. Grant and Karen were set up on a blind date in June of that summer, were engaged in July and married in August, 11 weeks after their first date! Grant



and Karen have now been married 11 years and enjoy time with their three children, Jessica, 9, Courtney, 7, and Tyler, 5.

Upon completion of his M.S. degree Grant went to work at Keller Associates, Inc. in Boise, Idaho. In his role at Keller Associates Grant worked on several roadway, site/civil and rest area design projects. After a short time with Keller Associates, Grant returned to Utah where he was employed as a practicing engineer in the Salt Lake City office of the consulting firm Sear-Brown. In his role at Sear-Brown, Grant was a Transportation Project Manager and head of the Traffic Studies Group for the Salt Lake City office. While at Sear-Brown, Grant completed more than 50 traffic impact studies, was involved in several transportation master-planning projects and was project manager for the I-15 modern roundabout interchange project in St. George, Utah. Grant is a registered Professional Engineer in the state of Utah and a Professional Traffic Operations Engineer under the Transportation Professional Certification Board, Inc.

Grant is currently finishing his Ph.D. degree in Civil Engineering at Texas A&M

University, where he is employed as a Graduate Research Assistant at the Texas Transportation Institute. The title of his dissertation is "Developing a Methodology to Account for Commercial Motor Vehicles Using Microscopic Traffic Simulation Models." While Grant has attended Texas A&M University he has been very active in the Institute of Transportation Engineers (ITE) Student Chapter, serving as President of the Chapter during 2002. He has received numerous honors and awards including Southwest Region University Transportation Center (SWUTC) Outstanding Doctoral Student in 2002, SWUTS Ph.D. Student of the Year in Transportation at Texas A&M University, Outstanding Student for ITE District 9, and was invited to participate as one of 20 students from across the nation in the 2002 Eno Transportation Foundation Tenth Annual Leadership Development Conference in Washington D.C.

Grant and his family are excited to return to Utah County where Grant will join the transportation division within the Department of Civil and Environmental Engineering. Grant hopes to continue the longstanding tradition of excellence for both teaching and research in transportation planning at BYU and looks forward to working with the faculty there.





# Department Passes Accreditation Process

The Civil and Environmental Engineering Department underwent a review in 2002 by the Accreditation Board for Engineering and Technology (ABET). We are proud to announce that the review process was successful and we have been accredited for an additional six years. We submitted a 300 page self-study report to ABET in July of 2002. In October our college was visited by a review team and one of the reviewers was assigned to our department. He spent two days going through the data and material that we had collected and reviewing every aspect of our undergraduate program. At the end of the visit he reported he was satisfied that our department met the necessary guidelines in every way. This was great news since we take the accreditation process very seriously. Accreditation is vital since a degree from a non-accredited institution is almost worthless. For example, to get a P.E. license, one must have a degree from an accredited program.

In the past, the criteria used by ABET to review engineering programs changed little for many years. The old criteria were quite prescriptive in nature, detailing how many credit hours should be offered in each subject and what features should be included in the curriculum. In recent years, ABET has completely overhauled the criteria used to review programs. Last fall we were reviewed under the new "ABET 2000" criteria. We have been overhauling our program to satisfy the new criteria for the past several years.

Under the new system, each program is required to implement



an outcome-based curriculum strategy. The first step in this approach is to develop a set of broad educational objectives. We have developed the following three objectives:

- A. Provide our students with a broad-based educational experience including an exposure to the liberal arts and a strong foundation in basic math and science.
- B. Maintain a strong program built around four fundamental civil engineering disciplines: water and environmental engineering, geotechnical engineering, transportation engineering, and structural engineering.
- C. Develop civil engineering graduates with integrity and a commitment to the gospel of Jesus Christ, and who are prepared for life-long service to community, church, and profession.

Once the objectives are defined, the next step is to develop a set of outcomes associated with the objectives. We have defined our outcomes in terms of a set of specific "attributes" we wish to develop in our students by the time they graduate from our

undergraduate program. These attributes are as follows:

1. An understanding of fundamental principles of mathematics and science.
2. An understanding of fundamental engineering science.
3. An understanding of geotechnical engineering.
4. An understanding of structural engineering.
5. An understanding of transportation engineering.
6. An understanding of water resources and environmental engineering.
7. The ability to design civil engineering systems and solve open-ended problems.
8. The ability to communicate ideas effectively.
9. The ability to use modern engineering tools.
10. An understanding of professional practice and a commitment to life-long learning.
11. An awareness of cultural, societal, and environmental issues.
12. A commitment to serve as professional engineers of integrity, and faith.

For each of these attributes, we also defined a list of specific competencies we wish to develop in the students. A complete list of the attributes and competencies can be found at: <http://www.et.byu.edu/ce/cweb/objectives/objectives.htm>

# Graduate Program Review

A formal external review of our graduate program was held late in Fall semester of this past year (2002). The review team was led by Loren R. Anderson, Professor and Head of the Department of Civil & Environmental Engineering at Utah State University.

Other members of the review team were Tom Sederberg, Professor of Computer Science, Richard Kellerns, Professor of Animal Science, and Richard Rowley, Professor of Chemical Engineering, all of BYU.

Prior to their visit, the team was given a packet of materials detailing our graduate program and ABET Self-Study Report. During their visit they met formally with Dr. Wood Miller, Department Chair, Wayne Downs, Graduate Coordinator, and with members of each of our emphasis areas: Rick Balling, Structures; Jim Nelson, Water & Environmental; Mitsuru Saito, Transportation; and Les Youd, Geotechnical. The team also met with Norm Jones and Jim Nelson who gave a PowerPoint presentation describing graduate research at the EMRL. They also met with groups of graduate students (M.S. and Ph.D. level), attended graduate seminar, attended a Masters Thesis defense for one of Fernando Fonseca's students, attended a BYU devotional, and visited all of the department laboratories, including wet labs, computer labs, and media enhanced classrooms.

In his Comprehensive Program Review to Gerrit W. Gong, Assistant to the President, BYU, Dr. Anderson reported: "I believe the graduate program has a clear definition of purpose that is in



line with the University mission and the mission of the department. All faculty members are committed to the mission of BYU. It is evident in their actions and in their department policies. Material that is covered in their classes is at the appropriate level for a graduate program. I was impressed with the quality of the faculty. They are committed to the values of Brigham Young University, they are dedicated to the engineering education and to their graduate students, and they contribute to the Civil and Environmental Engineering profession." (Examples of national recognition to Les Youd, Kyle Rollins, Norm Jones, and David Jensen were mentioned.) "Faculty members are engaged in research in which graduate students play key roles. The program requirements and the courses offered to support the M.S. program are of high quality and are in line with requirements through out the country. Graduates of the program are well prepared for the profession and are a credit to BYU. I was impressed by the fact that a large majority of the students finish their M.S. degree in a one-year time frame. The Department makes their undergraduate students aware of the importance of graduate school and then does an excellent job recruiting them to

stay at BYU for at least their M.S. program. The graduate office manager, Ms. Janice Sorenson, is particularly impressive in her knowledge of the program requirements and in her tracking of the progress of each individual student. Her enthusiasm for both the graduate program and the tracking of student progress is a valuable asset of the Department."

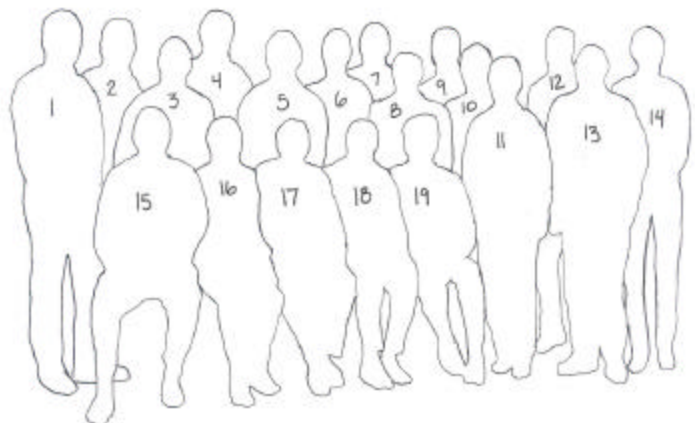
A few "more instructive" observations were made: "The Ph.D. program is small when compared to most research universities, and I expect under the current environment it will remain at about the same level. The requirements for the Ph.D. degree seem low, and I would recommend a reexamination of these requirements by the faculty. (Note: a reexamination was performed, and our requirements are similar to those at Utah State University, the University of Utah, Arizona State University, and the University of Washington.) One common theme among faculty and students was that the space and technician support was a weakness of the program. The structures laboratory is being heavily utilized. There seems to have been a renewed emphasis on experimental work in the structures area over the past several years. The hydraulics laboratory is limited in terms of graduate research and doubles for graduate student office space. Space is currently being developed for a transportation materials lab. There is only one technician for the Department and he is over committed. He is being extensively used on research projects and the Department is in desperate need of additional technician support just to support their current activities."

# Good Lookin' Guys

In November 2002 it was decided the Civil Engineering department should take a picture of all current faculty. Shirts were purchased and we were able to take this faculty picture. One faculty member wasn't able to be there that day, but thanks to modern day technology we were able to take a photo of him and cut and paste him in. Can you tell which one wasn't there originally?



(1) Steven Benzley, (2) Norm Jones, (3) Jim Nelson, (4) Wayne Downs, (5) Warren Lucas, (6) Spencer Guthrie, (7) Glen Thurgood, (8) Fernando Fonseca, (9) David Jensen, (10) Rick Balling, (11) Mitsuru Saito, (12) Alan Zundel, (13) Brett Borup, (14) Kyle Rollins, (15) Olani Durrant, (16) Les Youd, (17) Wood Miller, (18) Hank Christiansen, (19) LaVere Merritt.





# Alumni Activities



## Alumni Fish Fry brought to you by the Scholarship Society

Don't miss the chance to celebrate and reunite with old BYU friends. Come to the Civil & Environmental Engineering / Scholarship Society / Alumni Homecoming Reunion October 10, 2003. The dinner this year will be at the BYU Clyde Building stepdown lounge. We will begin with our leisure Social Hour from 5:00 to 5:30 p.m., where you can visit with friends and make new acquaintances. At 5:30 p.m., our annual Fantastic Fish Fry Dinner will begin with fresh halibut and salmon from Alaska, followed by a short program. We will be finished by 7:15 p.m. which will enable you to enjoy other Homecoming activities on campus that evening.



Please send us the following information to BYU Civil Engineering., Attn: Janice, 368 CB, Provo, UT 84602. You may also RSVP at (801) 422-2811 or email at [civil@byu.edu](mailto:civil@byu.edu).

Name: Last \_\_\_\_\_ First \_\_\_\_\_ Middle \_\_\_\_\_  
Address: \_\_\_\_\_  
City/State/Zip: \_\_\_\_\_  
E-mail: \_\_\_\_\_  
Phone: wk ( ) \_\_\_\_\_ hm ( ) \_\_\_\_\_ Fax ( ) \_\_\_\_\_  
Is this a new address? \_\_\_\_ Coming to Annual Fish Fry: No. attending \_\_\_\_ Adults \_\_\_\_ Children

Please RSVP by Monday, October 6.

# Scholarship Society

### Board of Directors

- Doug Ferrell, Society Chair
- Jake Dustin
- Brent R. Farr
- Reese J. Goodwin
- John Harper
- King Husein
- Ramesh Khona
- Bruce Larson
- Melvin Nichols
- Gene Shawcroft
- S. Olani Durrant

BYU Civil and Environmental Engineering Scholarship Society annually provides many students with scholarships to help them as they complete their undergraduate and graduate degrees within our department. We encourage you to join us in this effort which will bless the lives of deserving young men and women. Students are very appreciative of scholarships they receive. All contributions are given in direct scholarship funds to students based on accomplishments and need. One of our goals as a department is to strengthen and increase alumni involvement. Please fill out the form below and return it with your gift for the students. If you would like to be considered as a member of the Board of Directors, please contact Dr. Wood Miller, Department Chair, (801) 422-2811.

**NOTE:** Once again all money given will be matched 2 to 1 for alumni from the last 5 years and 1 to 1 for all other alumni.

### BYU Civil & Environmental Engineering Scholarship Donations

Name \_\_\_\_\_ Date \_\_\_\_\_  
Street Address \_\_\_\_\_ Amount \_\_\_\_\_  
City, State, Zip \_\_\_\_\_  
Phone ( ) \_\_\_\_\_ Fax ( ) \_\_\_\_\_ Email \_\_\_\_\_

Check this box if your company matches your contribution.

**Note: Please make check to "BYU" only. Do not include CEE in the name line.**

SCHOLARSHIP SOCIETY  
BRIGHAM YOUNG UNIVERSITY  
CIVIL & ENVIRONMENTAL ENGINEERING  
368 CLYDE BUILDING  
PROVO, UT 84602-4081







CIVIL TALK  
BRIGHAM YOUNG UNIVERSITY  
CIVIL & ENVIRONMENTAL ENGINEERING  
368 CLYDE BUILDING  
PROVO, UT 84602-4081



# Alumni

---

## **Jason Scott Earl '98**

After finishing his Masters in Civil Engineering at BYU in 1998 (thanks to a rewarding but grueling 2 years of working for Dr. Jensen), Jason and his wife moved to New Orleans, LA. There he worked as a structural engineer for Exxon, designing and installing offshore oil platforms in the Gulf of Mexico. At night, he attended business school at Tulane University where he earned an MBA in strategic planning and finance in December 2000. Soon after graduation from Tulane, Jason accepted a management position with World Minerals, Inc. in Santa Barbara, CA. He is currently working with operations, engineering, and finance personnel on new product development, acquisitions, and the construction of several new plants in South America, China, and Europe. He just recently passed the PE exam in Louisiana and is working on getting reciprocity with the State of California. Natalie and Jason now have 2 boys (Benjamin 5 and Jaden 2). They are enjoying life on the West Coast and love hiking and biking along the beach and nearby mountains. As two engineering students with a baby that spent far too much time in the Clyde building, they are grateful for all of the help they received from other students and professors. BYU was a wonderful experience and they hope to be able to give back in some small way to thank everyone!

## **F. Lewis Pratt '77**

Lewis returned from the Bureau of Reclamation in 1994 and became a partner in a small engineering firm in Provo. Some of the projects he has worked on are the Shops at Riverwoods, Vintage on the River, Home Depot in Lindon, Utah and the sites for several chapels in Utah County. His family built a new home in Mapleton about six years ago, and they are really enjoying the country life. Their two daughters and son all live in the state which allows the Pratts to spend considerable time with their six grandchildren. He has served as stake high councilman, Bishop, High Priest Group Leader, Family History Consultant, and Temple Worker. They have also traveled extensively - Europe, England, Korea, Japan, Alaska, Mexico, Puerto Rico etc.

## **Donald Champenios '85**

After over a decade on international projects Donald's family decided to settle down. They have now moved back to the US and back to their Alma Mater, just below the Y and above the BYU Creamery. They hope their children can attend BYU, the first will be next year. Donald is helping to open a new office of J-U-B Engineers in SLC and develop the municipal market, and at the same time develop the market for potable water and wastewater treatment throughout UT.

## **Darren Hymas '93**

Well, life goes on in Colorado. Darren is working on a design job for I-25 and some railroad work. The Hymas family is going to have their fifth child in March 2003.

## **Paul Hirst '94**

Paul graduated with a Masters in Architecture from Washington University (in St. Louis) in 1998. He recently started Hirst Design, a full-service architecture firm. He specializes in residential, light commercial and religious architecture.

## **Brandon W. Erickson '96**

After nearly five years with Degenkolb Engineers in Portland, OR, last year he joined Kramer Gehlen & Associates in Vancouver, WA as a project manager. Most of his projects include seismic upgrades of existing buildings. Sherry and Brandon have two great children: Emma 5 and Bruce 3. They love living in the Pacific Northwest. They are active in their ward and enjoy participating in road races, bike rides and triathlons.

## **Benson J. Whitney '97**

Benson received his P.E. one year ago. He was made a member/partner at McNeil Engineering and has worked there for four years. He has two girls; Caprice (10 months) and Saige 3.



# Alumni

## Jeffrey Armstrong '90

Jeff Armstrong, P.E., has opened J.D. Armstrong & Associates, a consulting engineering firm specializing in traffic accident reconstruction, forensic engineering, traffic engineering, eminent domain, and technical writing. He also provides litigation support, including expert witness services. Recently, Jeff was called to provide expert testimony on a drunk driving case. The driver was sentenced to 13 years in prison. Jeff credits his professional success to BYU's Civil Engineering Department and BYU's required writing courses.

## Albert M. Jack

Albert now lives south of the equator in Angola, but near the equator. For the third week in a row, there was no electricity at church ... so, no ceiling fans. They don't even hope for air conditioning, the members there are so poor; but even the Angolans are soaked wet by the heat. Many of them have little woven fans we use to try to cool off. That and the fact that Albert and his wife are the only non-Portuguese speaking members makes Sundays interesting.

## ABET cont.

*cont from page 4*

After formulating the objectives and outcomes, we reviewed the curriculum and made modifications where necessary to ensure that it is designed to satisfy the objectives and achieve the outcomes.

Finally, we developed a comprehensive assessment strategy to gauge our success in achieving the program outcomes. This strategy consisted of competency tracking on exams, the Fundamentals of Engineering Exam, alumni surveys, annual external reviews, student evaluations, and department/college/university reviews. We would like to thank all of you that have assisted in this process and we look forward to successfully passing the accreditation process again in 2008.



*Al-Weshah family (L to R):  
Dema, Areej, Radwan, Jumana*

*Dr. Jim Nelson, Sandra Rogers  
(BYU International Vice-  
President's Office), Dr. Radwan  
Al-Weshah, Dr. Wood Miller*

## Visitor from Egypt

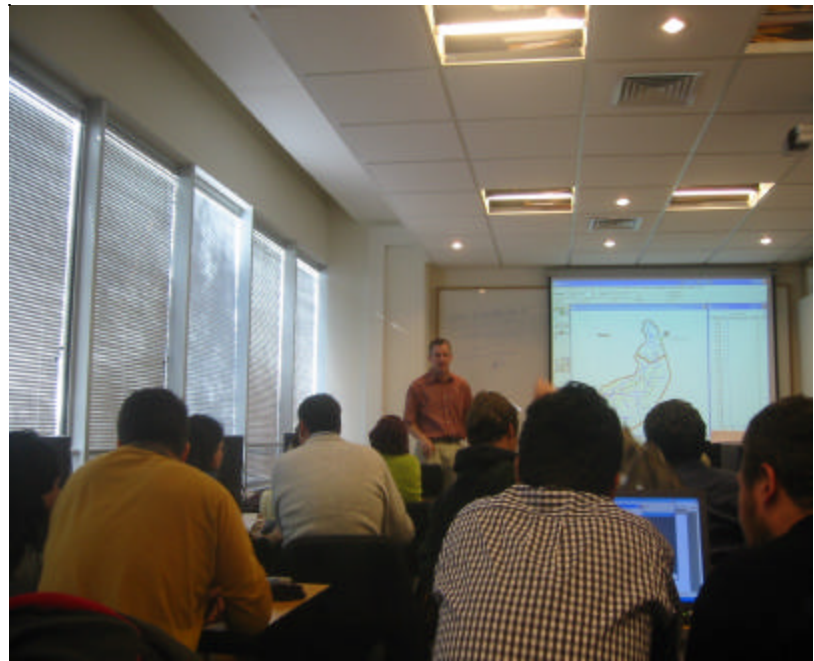
Dr. Radwan Al-Weshah was a visiting member of the faculty this summer term and taught our undergraduate hydrology class for a few weeks. Dr. Al-Weshah is the regional hydrologist (Arab region) for the United Nations Education, Scientific and Cultural Organization (UNESCO) and as such is in charge of directing important initiatives in cooperation with and research on hydrologic issues among Arab states. He was instrumental in the signing of a memorandum of understanding between BYU-Civil Engineering and the UNESCO-Cairo office last year and his visit was part of on-going collaborations that include some interesting projects involving the many African states that share the Nile River. Students of the hydrology class have enjoyed the international perspective that Dr. Al-Weshah brought to the classroom. We look forward to continued opportunities for academic and cultural exchange with Dr. Al-Weshah and our friends in the Middle East.



# Trip to Chile

In recent years BYU has sponsored small research grants for professors to encourage greater involvement of undergraduate students in research. Following a successful program last year that involved several students in collaborative projects throughout Egypt and culminated with a visit to Cairo, Dr. Nelson and Dr. Zundel have been awarded a grant for a similar program in Chile. From May 16-24 Dr. Nelson visited with scientists and researchers from the University of Santiago in Chile. The purpose of the visit was to provide basic training on the use of the Watershed Modeling System (WMS) in preparation of collaborative projects between students at the University of Santiago and BYU. During a previous visit to BYU instructions on the use of the Surface Water Modeling System (SMS), which will also be used in the projects, were provided for one of the professors from Santiago. These short courses were very successful and plans have been laid that will involve the students in the following projects:

- ~A flood warning system for Northern Chile that will include integrated hydrologic, hydraulic and flood plain mapping models.
- ~Integration of satellite rainfall forecasts with hydrologic models for prediction and warning of flood sensitive regions.
- ~Linking an ocean wave model to an existing hydraulic model



of a bay used for salmon harvesting in southern Chile. ~Development of a distributed, two-dimensional hydrologic model that will be used to monitor/maintain the natural ecosystem of a sensitive watershed undergoing developments in central Chile.

Students will be involved in ongoing collaborations with counterparts from the University of Santiago during the fall semester that will end with a planned weeklong visit in January to Chile, where more intensive talks and discussions regarding the progress and results of the modeling exercises will be conducted. Many of the students involved speak Spanish and will also have the opportunity to further develop their second language in the context of water resources. Further, it will be a great opportunity for cultural exchanges.

Dr. Nelson and Dr. Zundel, along with students in their research programs, have been responsible for the development of WMS and SMS, a state of the art computer programs, for hydrologic and hydraulic modeling. These programs are distributed through the BYU Technology Transfer office by Environmental Systems Modeling Incorporated ([www.ems-i.com](http://www.ems-i.com)) and are used by engineers throughout the world for water resources analysis and design. Collaborative projects such as this one and others in China and the Middle East have been made possible because of the widespread use and recognition of these programs.



# Alan K. Zundel's Research

The bulk of Dr. Zundel's research continues to focus on the area of numerical modeling of surface water bodies. This includes rivers, lakes, estuaries, bays and coastal zones. The basic premise is to utilize finite element and finite difference algorithms to simulate physical processes such as circulation, contaminant transport and sediment deposition/erosion. Specifically his research focuses on managing the raw data used to create these models, and then managing the massive amounts of data generated by the models. The product of his research is an internationally used software packages called the Surface-Water Modeling System, or SMS. The United States Army Corps of Engineers - Engineering Research and Development Center (USACE-ERDC) have been the primary sponsor of his research for the past seven years.

Over the past three years, Dr. Zundel has been heavily involved with the Coastal Inlets Research Program developing tools which assist the federal government in analyzing the approximately 30 federally maintained coastal inlets. This has led to the development of a complete interface for the finite element model ADCIRC which was recently featured on the cover of Civil Engineering magazine for the simulation of hurricanes in the Gulf of Mexico. This interface includes tools to automatically extract tidal constituents from several global databases facilitating the process of generating the



complex tidal boundary conditions for this model.

As computer processing capabilities continue to increase, the scope of what these can be used for also increases. Recently, algorithms have been developed for connecting two separate numerical models representing different physical processes. The methodology allows one model which simulates wave energy and wave heights to communicate with another model which computes coastal currents so that the processes of wave generated currents and current generated waves can be simulated together. In a similar approach, the tools can couple a circulation model with a sediment transport model allowing the complex process of erosion and deposition to be combined with the simulation of circulation in a river, estuary or lake.

Last year Dr. Zundel began working with the USACE in two other programs. The first is a new research initiative called the Regional Sediment Management

(RSM) program. The second is an ongoing research program known as the Dredging Operations and Environmental Research (DOER) program. The RSM program has the goal of understanding sediment transport processes in a local, regional and global scale for all time ranges from minutes to years. The program encompasses the generation of sediment in a riverine system all the way to effects of sediment transport on coastlines and beach erosion. Visualization and management of all this data is being added to his SMS package. The DOER program oversees the management of federal dredging operations that guarantee the operability of the nations coastal ports. He is working with the numerical models used by this program to allow them to communicate for the first time with state of the art circulation models to allow the engineers that manage the process of dredging and disposing of dredged material to consider all of the processes involved including currents, waves, environmental contamination and economic options.

Dr. Zundel is also involved in research with Dr. Mitsuru Saito applying image analysis to transportation engineering. They have developed a computer program that can take the video gathered at an intersection and compute an average delay at the intersection. The algorithm tracks each vehicle in a lane as it passes through the intersection.



# ASCE

---

A lot has happened in the past year with BYU ASCE Student Chapter. The annual elections were held in December and a new group of students were voted in as ASCE officers. The officers for 2003 are as follows: Blake Unguren (President), Carole Turley (1st Vice President), Andrew Stewart (2nd Vice President), Seth Bowles (Publication Secretary), Becky Luker (Secretary), and Travis Carroll (Treasurer).

The Student Chapter has accomplished many things in the past year. Our major focus in the Chapter is to reach out to the community in service and help them understand more about civil engineering and the program here at BYU. This past year we have continued with a couple programs that reach out to the surrounding schools. One of the programs is a balsa wood bridge-testing contest. We have visited 18 high schools and one junior high with this project. The students of these schools put balsa wood bridge kits together, in advance, either using a template or their own design. Then we visit the schools and, with the help of Dave Anderson, use a specially designed machine to test the bridges. The students have a wonderful time, while learning some engineering principles.

Another program that was done in the past year is Building Big. This program is designed for children at various schools to

gain an interest and a little understanding of civil engineering. It uses simple activities, such as building straw bridges and loading them with pennies, to show the children the fun applications of civil engineering. The teachers loved Building Big so much that we were invited to make a presentation about it at the Applied Technology Education Summer Conference to promote more interest at other schools.

This year we have been quite lucky because BYU has been constructing new buildings around campus, giving the Chapter plenty of opportunities to tour construction sites. We have toured both the new athletic facility and the new Joseph F. Smith Building. The new athletic facility is a steel structure making it very interesting for the students to see.

Last April the Student Chapter made its annual trip to the ASCE Rocky Mountain Conference. This year it was held in Logan, Utah at Utah State University. We did very well, getting second place overall, out of nine schools. We got second place in the non-technical paper, third place in the technical paper, and third place in the concrete canoe. We were all really excited on how well we did. Luke Hales did an excellent job heading up the concrete canoe. Painting the canoe was against the rules this year so our chapter added some dye to their concrete mixture

and the color came out looking similar to that of a chalupa. Thus the name of the canoe became the Chalupa.

We were asked to make a display at a scout expo that was held at Thanksgiving Point this summer. We decided to further promote civil engineering by using the same techniques used in the Building Big program. We had contests to see who could build the strongest bridge out of supply of straws, tape, and string. We also had a computer program set up for the scouts and leaders. It is called the WestPoint Bridge program. This program allowed them to design a bridge using the materials of their choice and the design of their choice. The program then showed how much the bridge cost and if it held up with a truck driving across the bridge. We also displayed the Chalupa and had a slide show of the Rocky Mountain Conference.

The Chapter also received the prestigious student chapter Ridgeway Award for this past year. This award is based on the presentation and contents of the annual report turned into ASCE. This is a great accomplishment and justly shows the attitude and direction of the BYU ASCE Student Chapter.

