Spring 2006
The Alumni Channel
St. Anthony Falls Laboratory

Master Plan/Future Plan:
Prospects of the SAFL renovation

The St. Anthony Falls Laboratory (SAFL) building was designed by the founder of the laboratory, Lorenz Straub, and former interim director, John Ripken, in the 1930s. The construction was done by 1938. The building was later modified several times over the past 68 years. The second floor (also known as the south mezzanine floor) was added in three separate sections in 1947, 1948 and 1952, the Turbine Room west mezzanine (where Jurassic Tank is currently located) in 1955, the east mezzanine (the Water Tunnel area) in 1959, the Model Floor in 1956 and 1959, the north wing office building on the third floor in 1963, the Quonset hut in 1965, the Turbine Test Stand enclosure in 1985 and the Wind Tunnel area in 1987. Since the beginning, SAFL has been managed as an independent research and education center of the University of Minnesota, and all its overhead earnings have been used to pay for the salaries of the staff members, and its daily maintenance and operation costs. In other words, the laboratory has been managed like a business while being regulated and operated by the University.

The SAFL building, as seen from the south side.

Crucial renovation and remodeling projects necessary to repair the deteriorating building have not been done expeditiously, as is the case with many buildings on aging University campuses. This became increasingly apparent in 2002, when SAFL became the home of the National Center for Earth-surface Dynamics (NCED), an NSF funded Science and Technology Center (STC). It is noteworthy that there are only 13 such STCs around the nation and NCED is the only STC housed at the University of Minnesota.

Since NCED started its operation, SAFL has been flooded with new faculty members, graduate students, post-docs, research and technical staff members, and visitors, as well as being busy with numerous meetings and workshops. Currently, more than 100 people work at SAFL– almost twice as many as before NCED. For over three years the SAFL faculty members, as well as the IT Dean's office and the Facilities Management of the University, have been working on addressing the deficiencies of the building and the need for its renovation. The collaborative efforts of the above entities ended in funding $180,000 for a master plan study to assess the existing conditions of the facility and to create an improvement plan. The study was completed by the end of 2005 by the Kodet Architectural Group in collaboration with Wenck Associates, Stanley Consultants, STS Consultants, The MountainStar Group, Hakanson Anderson Associates, GME Consultants and Adolphson Peterson Construction.

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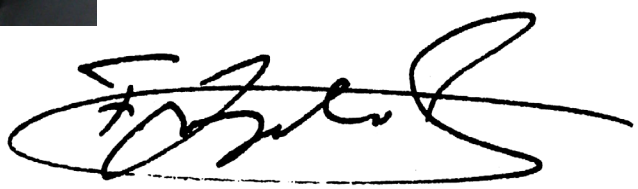
The Director's Perspective

My most memorable experience since I joined SAFL as its 12th director in early January 2006 was attending the seminar given by Ed Silberman entitled: "Lawrence Straub and the St. Anthony Falls Hydraulic Laboratory." Ed delivered a powerful and fascinating account of the early history of the laboratory and outlined the vision and resolve of the man who built it. The talk was inspiring yet humbling for me as it led me to ponder the magnitude and contributions of not only Straub but also of all subsequent directors. Straub had in mind a laboratory that was ahead of its time, one that was destined to be a pioneer in fluid mechanics research for decades and centuries to come. It is indicative of this vision that some 50 years ago Straub had seriously contemplated naming SAFL the "Minnesota Institute of Fluid Mechanics."

Pioneering vision and breaking with tradition have been the hallmarks of this lab throughout its history, and today Straub's vision of an "Institute of Fluid Mechanics" has become reality. NCED has catalyzed the lab's transformation from a traditional hydraulics facility to a hotbed of interdisciplinary research and graduate education; a unique place where our core expertise in fluid mechanics can fuse together with engineering, geology, ecology, bioengineering, and other fields to define and concur new scientific frontiers, produce new knowledge, and implement this knowledge to solve major societal problems.

And our commitment to cross-disciplinary research has only become stronger these days. This month we are excited to welcome the Department of Ecology, Evolution, and Behavior (EEB) as the third SAFL affiliated department. We also welcome EEB's head, Professor Claudia Neuhauser, as the latest addition to our faculty roster. Formalizing our relationship with EEB will only strengthen our already strong research ties and foster new areas for joint research and educational initiatives. SAFL has also just installed its first massively parallel supercomputer at the Minnesota Supercomputing Institute. The 220-CPU machine will be used to computationally study a wide range of problems, such as the blood flow in prosthetic heart valves, the hydrodynamics of aquatic locomotion, and the interaction of flow with vegetation in natural streams. Our main channel, possibly one of the world's largest indoor experimental flumes, is up and "roaring" again– now displaying its might as it transports huge amounts of gravel for NCED related research. Finally, during the summer we will be starting the construction of our new outdoor laboratory. In the next newsletter you will be reading more about this facility and how it will enhance our ability to provide research leadership in stream restoration and eco-hydraulics.

My first communication with you would not be complete without expressing my appreciation and gratitude to the people whose visionary leadership and hard work brought the laboratory to arguably the best point of its 68 year old history. Recent SAFL directors Vaughn Voller, Gary Parker, John Gulliver, Efi Foufoula-Georgiou, and Roger Arndt, and NCED director Chris Paola deserve great applause from everyone and especially from me. The same applies to the rest of our faculty, research and administrative staff, graduate students, and laboratory technicians. They are the ones that make SAFL work and make my job that much more enjoyable. Our main challenges for the future are to further expand our research horizons into new cross-disciplinary research territories and to raise the resources for implementing the master plan for the SAFL renovation. With the kind of energy, intellect, commitment to excellence, and collegiality this laboratory is filled with, I am optimistic that we can achieve whatever we set our minds to.



Fotis Sotiropoulos, Director of SAFL

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Paola Passalacqua (MS '05), being presented with the Silberman Fellowship award. Cyril Silberman, John Gulliver, and Ed Silberman are pictured with her from left to right.

Paola Passalacqua has been named the recipient of the 2006 Edward Silberman Fellowship for her excellence in scholarship and research.

Rob Stoll has been awarded the 2006 Tsai Travel Award toward travel to the 2006 European Geosciences Union General Assembly to present his research and in recognition for his record in research.

Ben O'Connor has been awarded the 2006 Anderson Award for his excellence in research and service to the laboratory.

Matt Carper received a 2005 Doctoral Dissertation Fellowship from the Graduate School.

Leonardo Cruz (PhD '05) won AGU's Fall 2005 Outstanding Student Paper Award for "Transient and steady-state kinematic response to erosional forcing in an orogenic wedge: Sandbox perspective."

Matt Wolinsky (SAFL post doc) received a 2006 Howes Scholar in Computational Science Award, granted by the Krell Institute and US-DOE to alumni of the Department of Energy Computational Science Graduate Fellowship Program.

Efi Foufoula-Georgiou has been elected a fellow of the American Meteorological Society. She was also elected to be a member of the executive council of the Consortium of Universities for the Advancement of Hydrologic Science.

John Gulliver spent fall 2005 as a Fulbright scholar at the University of Chile in Santiago where he taught a course on interfacial mass transfer and gave a keynote address at the 17th Congreso Chileno de Inginieria Hidraulica.

announcements

As part of Ecology, Evolution, and Behavior becoming an affiliated department with SAFL, we are pleased to welcome Claudia Neuhauser, professor and head of the EEB department, as a new member of the SAFL faculty.

Richard Hemmingsen, Director of the U of M's Initiative for Renewable Energy and the Environment (IREE), visited SAFL in April with IREE working group cluster leaders to discuss potential research opportunities, focusing primarily on renewable (wind and water) energy initiatives and SAFL's past, current, and potential work in that area.

The Outdoor StreamLab plans have been approved and construction is expected to begin in late summer/early fall of 2006.

The SAFL break room (aka "Riverside Cafe") will be closed for the month of June for renovations.

Vaughan Voller has been awarded the Aditya Birla Chair at the Indian Institute of Science Bangalore. Voller will spend 6 weeks in Bangalore this summer where he will focus on the teaching and research of models of crystal growth processes. In this time he will continue his work on developing crystal growth models for materials processing applications and also explore alternative application areas associated with the application of crystal growth models in natural and geological settings.

Claudia Neuhauser has been selected to receive a $1 million HHMI Professors award through the Howard Hughes Medical Institute's 2006 Professors competition. The HHMI selected 20 scientists who provide innovative leadership in teaching as well as research. Neuhauser's project aims to better integrate the teaching of math and science in the CBS undergraduate curriculum, particularly to improve students' ability to use statistics to solve biological and environmental problems.

Roger Arndt was invited to give the Keynote Lecture this September at the Sixth International Symposium on Cavitation CAV 2006, Wageningen, The Netherlands.

Main Channel Mor

SAFL's grand old workhorse, the Main Channel, has been reborn as StreamLab, an indoor, field-scale stream laboratory that is attracting engineers, scientists, and students from around the country. After extensive repairs and upgrades during 2005, the Main Channel is now into the fifth month of a yearlong set of experiments to test bedload-monitoring technologies and to study the interplay of geomorphology and ecology.

The Main Channel's size (84 m long, 2.75 m wide, 1.8 m deep) and capabilities (discharges up to 8 m3/sec, ability to re-circulate sand and gravel) make it an ideal facility for studying sediment transport, stream morphology, and eco-hydraulics at field scales, but under laboratory conditions. Add in NCED and SAFL expertise in flume enhancements and data capture, and you have a world-class facility. One measure of its importance and uniqueness is the number of people (40+) and organizations (20) who have lined up to participate in StreamLab's first year.

What was changed?

The first major upgrade involved the development and installation of a new weigh-pan system. Five pans span the channel, capturing all bedload as the flow moves across the openings. As the sediment in each pan reaches a pre-set (and changeable) limit, it is dumped into the recirculation system. Random fluctuations in the cross-stream transport rates mean that only one pan is normally going through the empty-cycle at any given time, giving an almost continuous measure of bedload transport rates.

The second major upgrade was to the channel's built-in instrumentation. A network of sensors using a calibrated sharp-crested weir equation was added to the downstream weir to measure discharge, and others to measure flow temperatures. Temperatures, discharge and weigh-pan data are all logged at one-second intervals.

Finally, a data acquisition cart was added to the Main Channel. It can travel up to 2 meters/second on the side rails, and can position probes in the three Cartesian directions (x,y,z). It can position itself, and the probes, with an accuracy of 1mm. The cart has a wireless transmitter to beam position and instrument data to the main computers, eliminating the need for wires.

NCED Visitor Program researcher and graduate student Rauf Ramooz (U. Ottawa) collects bedload particle velocity data using Acoustic Doppler Current Profilers.

In addition to the major upgrades, the recirculation system was overhauled, the head and tail gates were repaired, the electrical system was serviced, the viewing glass near the auger pit was polished, and parts of the flume were even painted!

Research scientist Sara Johnson takes water surface measurement with a point gage during a StreamLab experiment.

What's on the docket this year?

Now that the modifications are complete, a full year's worth of experiments is planned. The work this first year (known collectively as StreamLab06) falls into two categories:

Bedload monitoring: Bedload sampler testing has a long history in the Main Channel, and it seems fitting that the first suite of experiments in the refurbished facility falls into that category. This first phase of the StreamLab06 project was completed in late March 2006, and involved the testing of several existing methods and one new technology for sampling bedload transport. Technologies were tested in separate sets of sand and gravel trials.

For the former, the channel was pre-loaded with sediment consisting of uniformly sized (approximately 0.8mm) sand. Transported sand was captured in the channel's weigh pans, weighed, and re-circulated. The water discharge varied (from trial to trial) between 2.0 and 3.6 cubic feet per second.

Three standard samplers were tested: a 3" Helley-Smith, a 3" BL84 and an Elwha Sampler. For each, the sampler was lowered into the flow at a fixed lateral position in the flow, just upstream from the weigh pans. Samples were taken over times varying from 15 seconds to one minute to determine what sample-times are necessary to capture the natural variability in sediment transport rates. In addition to these samplers, two (1200 and 600 kHz) Acoustic Doppler Current Profilers (ADCP) were installed and tested. These units just touch the water surface, and have the potential to deliver non-destructive information on sediment transport. For this test, researchers concentrated on the zones just upstream and downstream of the unit. In the downstream zone, just up from the weigh pans, a velocimeter (16mHz Micro ADV) was used to create a velocity profile of the flow, which will be used to calculate bed stresses.

PHS INTO STREAMLAB

Finally, a 100 frame-per-second digital video camera capable of resolving individual grains captured the flow as it passed through the downstream zone.

For the second set of trials, the sand was cleared from the channel, replaced with gravel, and several runs with varying discharges (up to a maximum of 5.5 cubic meters per second) were conducted. The same bedload sampling technologies were in place for the gravel runs, and a Toutle River 2 sampler was added to the mix.

Not including NCED and SAFL personnel, 18 people from 10 organizations participated in these trials.

Ecogeomorphology: If the first phase was true to the Main Channel's past, the second phase is certainly focused on the future. In this suite of experiments, ecologists, engineers, microbiologists, and geomorphologists will be pooling their expertise to perform a sophisticated study of total stream response to certain changes in conditions.

StreamLab Project Manager Jeff Marr. The Main Channel is capable of recirculating sand and gravel, and continuous monitoring of sediment flux. The facility will be used for community-wide, integrative research on physical, chemical and ecological processes in stream.

The primary independent variables in this phase will be sand content and topography. These four basic bed conditions will be sequenced to allow researchers to study the effect of topography and sand content in a gravel-bed river on:

1. Gravel transport rates – looking at the changes in transport rates as the system goes from plane beds to alternative bars and from clean gravel to sandy gravel, and under various conditions of gravel storage on the bed using data from RFID-tagged gravel, micro-topography, and bed surface mapping.
2. Surface sorting and patchiness – studying how topography, surface structures, and patchiness interact with each other using data from micro-topography, bed surface mapping, and sampling.
3. Hyporheic exchange – taking advantage of the Main Channel's large size (i.e. field-scale), researchers can put a thick enough bed down to study the locations and rates of subsurface exchange with tracers introduced into the water column and bed.
4. Nutrient uptake – examining rates and spatial variability of uptake using tracers introduced in the water column and bed.
5. Periphyton abundance, distribution and dynamics – examining periphyton location and abundance using micro-topography, surface mapping, and sampling, and studying periphyton response to regions of up- and down-welling and regions of increased nutrients when the water warms in the summer.

In addition to these individual elements being studied, StreamLab06's collaborative, cross-disciplinary experiments will allow the study of many interactions between these elements. For example, researchers will look at the interaction of:

1. Hyporheic exchange with rates of transport and surface grain size and structure;
2. Gravel transport/paths with surface structures and patches;
3. Nutrient uptake with fines distribution, bar development, hyporheic exchange, periphyton distribution; and
4. Periphyton distribution with substrate composition and variability, fines distribution, and hyporheic exchange rates and distributions.

And for the future?

The Ecogeomorphology phase of this year's experiments is expected to begin in June and to last well into the fall of the year. Planning for StreamLab07 will begin this summer, once the first year's progress and the limits of the system are more fully known. For updates on the StreamLab06 and plans for StreamLab07, be sure to check the StreamLab web portal (www.nced.umn.edu/streamlab) throughout the summer.

—Michael Kelberer

alumni spotlight: Ina (Ekaterini) Daniil

Sometimes things work out for the best almost by themselves. This is what happened with me and SAFL. The University of Minnesota was the last university I had applied to for graduate studies. This was in 1982 and I hadn't checked out the courses offered or anything else. I remember writing in my application that "I am interested in Hydraulics and Hydrology and I'm not afraid to pursue a graduate program that requires hard work." I received an offer for a research assistantship and noticed from the address on the envelope that the lab was in the Mississippi River. Both my husband (we weren't married then) and I were offered assistantships and chose the U of M for our graduate studies. We spent seven wonderful years of our lives in Minneapolis– from September 1982 to December 1989.

I was the first student of my advisor, John Gulliver, to earn a PhD, and the first woman to receive a PhD from the lab in its first 50 years (as far as I can tell from the list in Mary Marsh's book). My work at the lab was my first work experience and I value it very highly.

Having done my diploma thesis on computer programming back in Greece, I chose an experimental topic for my PhD. The biggest challenge was trying to make sense out of the experimental results. Keeping in touch with both the real-world problems and the assumptions made while creating a solution is crucial in both research and design. (For example, the "best" hydraulic cross section isn't always the best when applied to non-uniform flow.)

John Gulliver was an excellent advisor, and we collaborated on research, papers, projects, and field work. I also took courses offered by Heinz Stefan, Gary Parker, and Charles Song which were very valuable to me and my future work, as were the courses I took with Suhas Patankar in the Department of Mechanical Engineering and Tom Lundgren in the Department of Aerospace Engineering and Mechanics.

I am the kind of person that doesn't get stressed in a negative way. The only really stressful period was trying to get my PhD committee together for the final exam.

While at the lab, I enjoyed being a member of the AWRA Student Chapter, organizing a series of student seminars and international nights. I have very fond memories from my time at SAFL and enjoy keeping in touch with fellow students from the lab- before or after me, such as Alex Demetracopoulos and Alicia Urban. The SAFL connection is always very strong; I still have contacts with all my coauthors of SAFL reports, and still receive invitations for SAFL alumni lunches in Minneapolis.

After leaving for Greece I visited Minneapolis twice: in 1993 on my way to the ASCE Hydraulics Conference in San Francisco and again in August 2000 for the ASCE Water Conference in Minneapolis. The second time many SAFL alumni were there and Chris Ellis offered his house where we had a nice party. At the IAHR Conference in Thessaloniki, Greece, I again had the chance to get together with friends from the lab.

I have been working with Hydroexygiantiki (near Athens, Greece) for almost 16 years now on projects relating to the design of dams, stormwater and sanitary sewers, and irrigation systems, mainly on the hydrologic and hydraulic elements.

My words of advice to current and future students: SAFL is one of the best places to get an education in fluid mechanics. Make the best out of it and always get your own hands-on experience through field trips and performing your own checks of computations and underlying assumptions.

—Ina Daniil

Stream Restoration Certificate Program

Rivers are receiving more and more attention these days from citizens, agencies, and nonprofit groups seeking to restore functional habitat, improve water quality, and best manage riparian corridors. According to a recent survey published in Science (v.308, 636-637, 2005), upwards of $15 billion has been spent since 1990 on efforts to restore and rehabilitate streams in the United States, and the amount continues to grow. Stream restoration efforts require a complex blend of hydrology, ecology, geomorphology, and engineering, yet many practitioners lack integrated training in these fields, and few university-level programs exist to educate current and future practitioners. The National Center for Earth-surface Dynamics at the University of Minnesota seeks to fill that gap by offering a new graduate-level certificate program in stream restoration science and engineering.

A newly offered program designed to blend engineering, physical, biological, and social sciences in all aspects of stream restoration projects, the certificate can be a stand-alone qualification or used as part of a Masters or PhD program.

The foundation course, Introduction to Stream Restoration, is a fall-only required course which will provide an overview of stream restoration focusing on the main issues related to coupling the fields of civil engineering, ecology, geology, and social science. It will include background classes on basic engineering tools for stream restoration (GIS, Surveying, Computer Applications, and Statistics) and case study analysis. In addition, the capstone course, entitled Stream Restoration Practice, will be a May term field-based required short course during which students will visit recently completed and ongoing stream restoration field sites to see how the stream restoration science and engineering learned in the classroom are applied to real-world restoration problems.

Eleven elective credits are also required, chosen from the following areas: River and Floodplain Science and Engineering; River and Floodplain Ecology; Water Quality; and Water Policy and Management.

For more information about this program, please contact Karen Gran, Program Coordinator, at kgran@umn.edu or Vaughan Voller, Director of Graduate Studies, at volle001@umn.edu. (The application deadline is June 15.)

Waukegan River (before restoration)

Photos courtesy of Robert Newbury

Waukegan River (after restoration)

FACULTY FOCUS: EDWARD SILBERMAN

The following is an excerpt from an interview with Ed Silberman as a follow-up to his Spring seminar presentation. To read the full transcription, go to www.safl.umn.edu.

What project(s) is SAFL known for? And what was it about these projects, or the people that worked on them, that gave us part of our reputation?

The earliest projects were more or less specifically related to hydraulic models and, of more less importance, structures. Lorenz Straub (who was director of the lab then) was a consultant on many of these projects. He was hired by the principal design engineers for the project to be a consultant, and usually as part of his consultancy, he recommended a model study. This of course brought overhead to the lab and it also enabled us to do research beyond just what was necessary. For instance, we were early workers on fish bypasses. Some We were also early workers on some of the cavitation problems on spillways. In particular, we ran into a real problem on the Guri Dam for ALCOA (Aluminum Company of America) in Venezuela, where we had worked on their original model study and helped them design the spillway. It turned out there were cavitation problems, so they came back and we had the opportunity to do some rather fundamental work on what causes cavitation in a spillway.

There were a number of other model studies that brought us a chance to look at basic research that way, even though the principle overhead came in just because we did the model study. We developed a lot of know-how on drop shafts for spillways. We started our most well-known one, a Chicago system. Chicago had to do something about their major sewer overflows, and the way they finally decided to do it was with deep tunnels under the city where the surface sewage would run down to these tunnels and be stored there until it could be pumped back up to be treated, which was a nice innovation. They brought the project here to study and model what could be done so that we could drop this sewage water down a shaft, hit the bottom, not carry it up, and therefore not blow the sewer manhole covers off.

Another thing that we started early on: Straub, Anderson, and Ripken all had connection during WW2 with civilian Navy work. They did this in order to avoid the draft and still do work pertaining to the national effort. The result of that, when they came back, was that we were in a position to make proposals to the Navy department. The Office of Naval Research (ONR) was the basic supporter, but the David Taylor Model Basin (DTMB) was a practical laboratory for the Navy for looking at ship models. They needed not only a big towing tank, but they also needed a bigger water tunnel. We were able to make proposals to the DTMB to design their water tunnels and help design critical elements in their towing basin– wave absorbers, for instance, and wave makers. Our main channel permitted us to make wave makers and study them at the head end, and we had built wave absorbers at the downstream end that we could study. One of the big things that ONR supported us on was hydrofoils for supporting naval craft. Now the DTMB was studying practical design models of hydrofoils, but the ONR was looking at the basic facts and so we got to do a lot work with that; mostly with the mechanics of hydrofoils and the shapes of profiles, but also with the effect of air bubbles being injected so as to make supercavitating air foils, which had some advantages.

We also got into fundamental work on making air bubble solutions in water, which was desirable not only for low drag, but it was also desirable for noise inhibition, sonic protection, so that sonar couldn't ping on a boat. You could run air bubble skirts around a ship, if you could do it properly, and then sonar trying to hit the ship would be deflected by the air bubbles. I personally worked a lot on the air bubble project.

Tell us about the Mississippi River model.

That was the earliest river model in the lab, and essentially what happened was that Straub found out as we were building the laboratory that the Corps of Engineers wanted to build a large model of this section of the river– here and down a ways below the falls. It was to be done by the Corps of Engineers and they had a connection at the Iowa Institute of Hydraulic Research where they kept staff and were proposing to do that work there. Well, it was all postponed until after WW2, and when Straub finally got to getting the lab going, he realized that project was going to go ahead without him and he didn't like it! So he got the congressmen busy and he got busy and they convinced whatever powers that be, that that model had to be built right here on the site. Of course this enabled him to build a wood floor in there to put the model on, the floor which finally became concrete in the 1950s. Straub got the Corps to set up an office here, taking it away from Iowa City, and to build and operate the model from this very small group they had here. That eventually led to setting up a Corp office here and moving people up from Iowa City who later got involved in instruments for sediment, especially bed load sediment transport. They also brought in the US Geological Survey, so they had somebody stationed with the Corps here. Eventually the agencies and the US government that were interested in sediment transport (which was all of them- the Corps, USGS, the Forest Service, the SCS, and the Agricultural Research Service) all got interested in forming a joint organization, a government commission, to look into that, and they became headquartered here.

The Mississippi River model was an important thing at that time- it got a lot of publicity. We were looking at the currents and whether they would tear up the banks. There used to be a little island down there, and we looked at how it would affect the island if they built the locks, and what kind of flow changes there would be in the locks. We also looked at what kind of foundation changes in all the bridges they would have to make. They were studying the currents and how they really erode the bridge piers, and the shorelines, and the islands.

Do you feel that when the Corps and the USGS came here the lab changed, not just the culture of the lab, but the relationship between applied research and basic research? And the academic component versus industry?

The lab was not really designed for much basic research. Straub was a practical engineer, and what he was trying to do was solve problems that he could see in the field. And it did take some fundamental work. Of course he taught classes; he was familiar with the fundamentals of these things and sediment transport, particularly. But sediment transport at that time was, and still is, a largely empirical science. And this is the kind of basic work he was interested in– that you could develop empirically and apply to the projects that you had to work on. He was good at it and he gained an international reputation. But that was it. He did not teach the fundamentals of turbulence. Straub, basically, was an empiricist. What he considered basic was developing empiricisms that could be used, so that was it.

When you were working on the original designof the lab, did you anticipate that SAFL was going to do ground-breaking research, or were the designs based on existing facilities?

When we designed the main channel back there, I think Straub had in mind doing large-scale work on rivers, sediment transport. And building sand dams in there and designing levees and stuff like that. We were going to run a lot water through here, and we were going to do a lot of things. Another thing we were going to do, which kind of dropped by the side later on, was turbines and pumps. We have a kind of lab here now, but Straub never carried through. That big room down there, which didn't have any kind of mezzanine level, that lowest level, went all the way up to the outside paving out here. It was one huge room. And that was the turbine and pump laboratory- he certainly had that in mind. I found in his files all kinds of literature on what was to go in there- correspondence with all the people who built pumps and turbines. He had that in mind originally, but that all fell by the wayside because he couldn't get enough support. He also had in mind river channel design, and the main channel, and then he had one of these adjustable angle channels, which sits down on the main floor just as you come down the stairs, that channel we can jack up and down- that was built as part of the original laboratory. That was looking at the effect of slope in a channel- how the supercritical flow developed. That was a topic he was quite interested in, and its application to spillways and natural rivers that occurred sometimes in steep chutes. What was being built was to satisfy what he felt were the needs.

You completed your Master's here, then left SAFL and the University, and returned in 1946. Where did you go?

Oh, I went to a lot of places. I was interested in going around the world. I took civil engineering because I understood that I could go almost anywhere I wanted to go and do almost anything I wanted to do. I wasn't particularly interested in hydraulics. It was only because when I got out of school Straub approached me and told me he'd like to have me continue on and work with him and what he was doing. And so I did. I came in as a Master's student for him. We discussed the possibility of me coming back for a PhD, but I had no intention of doing that. When the WPA came along there were a lot of things that were being supported by Federal agencies. One was a State Planning Board that was going to look at water in the state. They were looking for somebody to run around the state and write up all the drainage basins. They hired me right after my Master's degree, and that summer I went around and looked at all the river basins in the state and wrote them up.

What was it that brought you back to the lab eventually?

Naturally, when I got out of the army, I went back to the Civil Aeronautics Authority. And I could see it wasn't for me. I didn't like that anymore- I was married, I'd settled down, a lot of things. So I looked at the Bureau of Public Roads and committed myself as a drainage engineer. I was walking down the street one day (in Washington) and I met John Ripken. We talked a little bit and I told him what I was doing, and he told me that he'd been working at the David Taylor Model Basin and he was going back to work for Straub at the lab. He was going to take his position back up as an instructor. Of course Straub told me that he'd talked to Al Anderson and John Ripken- they'd all come back, and these were all people I knew of course. He said, "I want you to be part of the team." So I came back as a Research Associate; all I had was a Master's degree. I came back in November of 1947.

And then you became Director, after Straub passed away.

It so happened that when Spillhouse (then Dean of IT) came here to look at the lab I showed him around and we talked a lot. He apparently followed the things I was writing in- I wrote in many different periodicals, some of which were not in civil engineering at all. He happened to see those, and I'd been in contact with him off and on. When Straub died, Spillhouse called me on the telephone and said, "I want you to take over the lab on a temporary basis." This was on Monday morning; Straub died sometime earlier that night– Sunday night. It was quite a shock to me, and a lot of the other guys were disappointed too. I know Al Anderson was particularly because Al had the PhD and I never got a PhD. My position should have required a PhD.

And you were Director from'63-'74.

I was temporary Director from '62-'63, for about a year. I stayed on until '74 and at that time I mentioned to Al Anderson that I was getting kind of bored and there were just too many things that I didn't feel like I wanted to be involved in. I'd rather get down to doing research work again. Al went to Miles Kersten (then head of CE) and told him that he'd heard me talking about wanting to give up, and Al felt very strongly that he should have a chance at that. So we agreed to do that. Al died within the year, trying to make a trip to a meeting that I wouldn't normally attend anyway- the International Association of Hydraulic Researchers.

I never thought that I did an outstanding job as Director. I kind of ran the ship and kept it at an even keel. I did change things; I opened the Director's door to everybody. You didn't have to go through the secretary to see me. I did a lot of other stuff, but they were housekeeping things, really. There were no big steps. Well, we did a lot more NSF proposal work, of course. But those were minor changes. I retired formally in December of '81. Then I kept on doing research work and teaching. I got into water resources planning and management, environmental work. That's what I was really getting into when I finally retired; I got heavily involved in that. After I gave up the Directorship, I thought that would be an interesting field to pursue.

—Maia Homstad

Congrats Graduates

Paola Passalacqua (MS ‘05) with advisors Fernando Porte-Agel, Chris Paola, and Efi Foufoula-Georgiou

Dan Murphy (MS ‘06) with advisor Heinz Stefan

Tanya Warnaars (PhD ‘05) with advisor Miki Hondzo

Justin Syrstad (MS ‘05) with advisors Gary Balas and Roger Arndt

Eric Novotny (MS ‘06) with advisor Heinz Stefan

Miguel Wong (PhD ‘05) with advisor Gary Parker (Miguel’s wife Erica, center)

Not pictured: Leonardo Cruz (PhD ‘05) with Lesley Perg, Dylan Blumentritt (PhD ‘05) with Lesley Perg, Jim Kopriva (MS ‘06) with Roger Arndt, Cristie Kearney (MS ‘06) with John Gulliver, and Crista Brin (MS ‘06) with John Gulliver.

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Nels Nelson
Joseph Orlins
Aeek Paintal
Christopher Paola
Gary Parker
Michael Riley
Idell & Edward Silberman
Frank Tsai
Vaughan Voller
Catherine Wetzel

Thanks in part to a generous donation from Barr Engineering Company, SAFL has established the Barr Distinguished Lecture Series. The first speaker in the series was Mark Solien, Vice President of Technical Organization at ExxonMobil Exploration Company.

SAFL Director Fotis Sotiropoulos presents Mark Solien with a peel from the lab's Jurassic Tank.

If you would like to make a future contribution to the lab, please contact: Jennifer Clarke, Development Officer, at jclarke@mail.itdean.umn.edu or (612) 626-9354.

SAFL Renovation continued from page 1

The result of the study indicates that the building is structurally sound, with the exception of the upper deck. However, there are numerous problems with the building codes that need to be addressed as first priorities. A new elevator should be added next to the current elevator which has been abandoned since August 2003 after the inspection done by the state inspector. The building is also in need of an HVAC system as well as a new electrical system for most of the building. The above costs plus the cost of interior issues as asserted in the document prepared by the Kodet Architectural Group add up to $11.5M, of which $1.4M is estimated for the new upper deck. However, we have confirmed that the upper deck can be repaired and reinforced for no more than $400,000. Therefore, it is anticipated that the overall renovation costs will not exceed $10.5M. Now, SAFL is determined to repair the upper deck in 2006, and there are indications that the University is prepared to pay for a new elevator which will cost about $1.3M.

The study done by the Kodet Architectural Group also indicated the need for an additional 14,000 square feet to meet the current needs of the laboratory. The discussion about a new building where the Quonset hut is located has been around for at least three years and seems to be welcomed by Xcel Energy, which owns the property, as well as the riverfront community. Nevertheless, it won't be addressed until some of the renovation projects of the main building are completed.
During the past three years, a sum of money has been spent on remodeling the graduate student, post-doc, and support staff' offices in order to accommodate our growing numbers. (Currently: 40 grad students, 11 faculty, 10 post-docs, and 25 staff.) In addition, the old dark room and a storage room have been converted to new offices. Furthermore, the old fluid lab on the second floor (Ecofluids lab) has been expanded, remodeled, and equipped with new instruments, devices, and cabinetry.

SAFL's quonset hut: future site for offices?

To complete the lab's renovation project, a campaign for fund raising will be necessary. We at SAFL are looking ahead into the near future and determined to convert the building to what it should be as a world-renowned multipdisciplinary research facility in environmental, geophysical, and biological fluid dynamics.

—Omid Mohseni & Fotis Sotiropoulos

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For more information about the lab
please visit www.safl.umn.edu

The recipient of the NCED Photo Contest is Joel Rowland (NCED graduate student at the University of California, Berkeley) for his photograph of Lake Murray in Papua, New Guinea (at right). Joel will receive up to $500 toward attending the professional conference of his choice.

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