



## Geophysics Program Gains New Faculty Member

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### TECHtonics Staff

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### By Jolante van Wijk

Assistant Professor of Geophysics

Hello, I am the new Assistant Professor of Geophysics in the department. It is great to be joining such an accomplished group of earth scientists, and I'm looking forward to fruitful collaborations in the coming years!

I received my B.S., M.S., and Ph.D. in the Netherlands from Utrecht University and the "Vrije" University in Amsterdam, respectively. I then moved to San Diego for a post-doc at Scripps Institute of Oceanography, and to Los Alamos, NM for a research position at the Los Alamos National Laboratory. Before coming to Socorro, I was Assistant Professor of Geophys-

ics for 4 years at University of Houston, a large inner-city university with strong industry ties. I am PI of an industry consortium based in Houston that focuses on the onshore Gulf of Mexico petroleum system. It was great to experience the culture and (almost sub-tropical) climate of southeastern Texas, but I am happy to be back in New Mexico.

At Tech my research will focus on two areas: geodynamics and basin analysis studies for petroleum exploration. I use geodynamic models (computer models) to study stress and deformation in the crust, lithosphere, and upper mantle. In the last decade, these geodynamic codes have become very advanced, and today we develop them within an NSF-sponsored, nationwide infrastructure. My geodynamic studies focus on the Western U.S. and on

(See Jolante van Wijk, pg. 6)



## Ingar Walder, Visiting Faculty & Tech Alumnus

### By Ingar Walder

Visiting Professor of Geochemistry,  
Ph.D. Geochemistry, 1993

Hello, I am a Visiting Professor of Geochemistry helping to maintain a strong geochemistry program at NM Tech. I am also an alumnus of the E&ES department (graduated with a

Ph.D. in Geochemistry, 1993). It is great to be back in Socorro in a vibrant research environment reconnecting with old colleagues, establishing new relations, and, hopefully, initiating collaborations for the coming years!

I stayed in New Mexico for almost ten years after graduat-

ing from NMT, working as an independent consultant within the field of mining environmental issues. The work was very focused around mine waste and mine water geochemistry. I maintained ties with New Mexico Tech, taught

(See Ingar Walder, pg. 6)

## *Note from EES Department Chair: A Flurry of Changes*

### **By Gary Axen**

Department Chair,

Associate Professor of Geology

Fall again, and already time for a departmental summary for *TECHtonics*! This past year flew by in a flurry of changes at EES. We are very happy to be joined by Assistant Professor Jolante van Wijk, a geodynamicist with strong interests in rift dynamics and evolution of petroleum basins. We were lucky to draw her from the University of Houston, and she brings many great oil-patch connections. She will teach courses in reflection seismology, basin analysis and geodynamics, among others.

We also hired a new Economic Geologist/Geochemist to join the department, as Andy Campbell retired in June—Assistant Professor Kierran Maher will allow EES to maintain a vibrant economic

program and keep our strong collaboration with Mineral Engineering alive. Kierran worked on Cu isotope partitioning during his Ph.D. and will take over the stable isotope lab, which supports a great deal of EES research, not just mineral deposits. Kierran will arrive in Jan. 2014.

However, these additions are balanced by the retirements of Andy Campbell, Phil Kyle (both in June 2013), and Kent Condie (June 2014), and the coming departure of Rick Aster (January 2014). Andy, Phil, and Kent will continue with research (and consulting in Andy's case) that will benefit EES and our students, and we expect to continue to collaborate with Rick. In addition, Dave Johnson has finished teaching, some three years after retirement, and Ron Broadhead (Bureau) is no longer teaching Petroleum Geology after 32 years covering that important course. We have a search approved for Rick's successor, and I am

working on getting a position in sedimentology-stratigraphy-petroleum geology approved.

Unfortunately, New Mexico, NMT, and EES are still struggling fiscally, and your donations, especially to the department, are desperately needed. Peter Mozley has taken over as EES Alumni Coordinator, so please contact him to discuss options.

We hope to see you at 49ers! Have a great year-end and winter!



## *Thoughts from Aster as He Transitions to Colorado State*

### **By Richard Aster**

Professor of Geophysics

It is with very fond memories and best wishes for the Earth and Environmental Science Department that I will be migrating north to take on new challenges as Department Head of Geosciences at Colorado State University beginning in January 2014. I won't belabor the multiple reasons for this mid-career relocation but would

like to instead concentrate on the future of Earth and Environmental Science at NMT.

The department here has always been an exceptionally collegial and supportive place for new faculty to pursue internationally recognized teaching and research. I immediately realized this upon relocating here from San Diego as an assistant professor, along with my wife Jan and then one-year-old daughter Ellen (our second daughter Julie would arrive later), during the lovely, green, Socorro late summer of 1991, much like our rather wet summer of 2013.

Across the past 22 years, while Jan pursued multiple satisfying opportunities in Socorro regional nursing and health education and our daughters grew up (Socorro has been a wonderful place to raise our kids), the strong support of my colleagues and staff in the department (and, at times, from the NMT administration as well) has been invaluable to my growth as a teacher, scientist, advisor, department chair, and

contributor to the international seismological community.

I would note that the current department chair, Gary Axen, is as dedicated and tenacious a leader as EES has ever had. I will continue to support him and the department after my departure for Colorado as an active adjunct professor pursuing joint research activity and student advising. It is no secret that higher education in New Mexico and NMT, specifically, face a number of difficult challenges.

However, alumni support without doubt can be a principal component of addressing these issues and maintaining strong Earth and Environmental Science programs at this remarkable, small university on the Rio Grande. So, I will close by encouraging our many alumni to continue to grow their engagement and support for EES; there are many ways that your input and support can critically contribute to the department's future!

**"I will continue to support ... the department after my departure for Colorado as an active adjunct professor pursuing joint research activity and student advising."**

**-Rick Aster**



# Condie Plans a Research-Filled Retirement

**By Kent Condie**

**Professor of Geochemistry**

It was a hot day in June of 1970 that I drove into Socorro, a sleepy little town of no more than 5,000 people, with my wife Carolyn and our two daughters. I wondered if we had really made the right decision to come to New Mexico Tech—could I really continue with my research here and keep support dollars coming in?

It took a few years for me to see that it was the right decision. I continued to receive NASA and NSF support for my research on the evolution of continents and on Archean greenstones (volcanics greater than 2.5 billion years in age), taking me to some remote places on the

planet to collect samples and study the geology (i.e. Siberia, NW Canada, central and southern Africa, Brazil, Western Australia, southern India, and northern China).

I have supported numerous M.S. students and seven Ph.D. students on my grants over the years. I also have had a great time teaching upper-level courses, especially field-oriented courses like my geo-river trip course and the Colorado Plateau course.

Now, after over 40 years at New Mexico Tech, I am going to retire in 2014—but only from teaching! I will continue my research programs, perhaps enlarging the number of projects.

Currently, I am collaborating with over ten different scientists around the world to address specific questions about the origin of continents and the evolution of Earth systems for the last 4 billion years. I intend to focus on episodic zircon ages through time and their significance in terms of the supercontinent cycle; the evolution of planet Earth from a stagnant lid regime (like Venus today) to a plate tectonic regime (why and when it happened); growth and destruction of continental crust (are we really losing continents as fast as they are forming?); and a whole list of other projects for the future. So retirement is not going to be gardening, TV, and computer games for me!

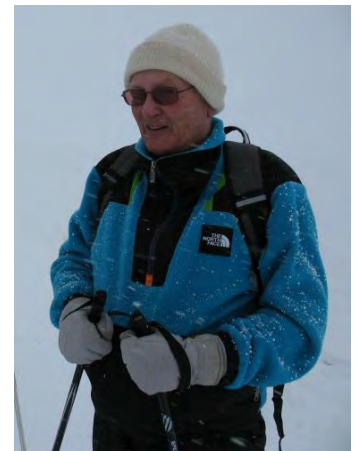


*Kent and his students often hiked up steep slopes to study rocks as shown in this photo on the San Juan River, 1984.*

**"Now, after over 40 years at New Mexico Tech, I am going to retire in 2014—but only from teaching!"**

**-Kent Condie**

*Pictured Right: Kent cross-country skis in the Valles Caldera, 2010.*



*Kent needed four students up front to help avoid capsizing on the Warm Springs rapid on the Yampa River, 1989.*



*Kent and his students examine the modern sediments at the mouth of Coyote Wash, a tributary to the Delores River in SW Colorado, 1998.*



*Andy hides amidst wall-to-wall balloons in one of the first of many birthday pranks he will enjoy, April 1998.*



*Who's this cowboy (circa 1997)?*



*Sareeb, Colonel Bob, Gomer, and Patti-belle celebrate Andy's April 2010 "redneck" birthday.*



*Andy fishes for travertine during his Reservoir/Caprock Field Class at Crystal Geysers, Utah, Aug. 2012.*



*Andy sings karaoke during a 1993 trip to the Philippines.*



*Andy and "Pinata Andy" enjoy their retirement party at Bill McIntosh and Nelia Dunbar's house, April 2013.*

## *Campbell Enjoys Life after Retirement*

**By Andrew Campbell**

**Professor Emeritus of Geology**

It has been 30 years of fun, but I am ready for some time-off and to try something new. As I look back over my career at NMT, it is the joy (usually) and anguish (only sometimes) that you students have given me that stands out in my mind. The spark of insight when students figure out how to identify a mineral or see the interpretation from their isotope data is what makes teaching an exciting job.

I thank you students for all that we

have shared: field trips, raft trips, long nights in the lab, Eaton Hall Social Club, research projects, and the ups and downs of each others' lives.

It has been fun to come in on my birthday and find my office redecorated. There are still remnants of most of the years in my office: a little birdseed in the desk drawer, a bat symbol on the ceiling tile, a few peace signs hanging about, the ΑΣΣ frat poster, sparkly fishes, Nascar souvenirs, and my royal cape are a few.

To celebrate my retirement, we took a six-week road trip through the North-

west/West. For the most part, we stayed off the major highways and took small roads though the mountains. We went through the Rockies, Medicine Bows, Big Horns, Absarokas, Glacier, Cascades, and the Sierras.

It was a wonderful time and taught me to relax. But I will still keep busy in geology. I'll be working as a consultant in mineral exploration and lending a hand with a new analytical lab in Albuquerque that will do exploration assay work.



## *Kyle Retires from EES (or Just Moving Sideways?)*

**By Phil Kyle**

**Professor of Geochemistry**

To retire is defined as “to give up work completely and to go away or to withdraw to another place.” Okay people: you are not getting rid of me that easy! Perhaps I should label myself as semi-retired.

In reality, not a lot is changing for me, and even semi-retired does not seem like a good label. After 32 years in EES, the Educational Retirement Board is now sending me a monthly check, but for the 2013-14 academic year, I am retaining my academic affairs position as a quarter-time faculty member.

This is a time for me to clean my closet—in other words, get a bunch of graduate students finished and graduated! There are seven of you out there (Aaron, Dan, Dave, Drea, Lara, Laura, and Nels).

At the same time, I just picked up a new M.S. student, Emily Randall, who will work on Antarctic volcanic rocks.

Antarctica is a very easy place to be excited about, and it has been a unique opportunity for me to have completed 40 field seasons working down there. I ask myself, what the hell am I doing advising eight graduate students, and I am retired? Basically, I retired to allow the department to find some new blood (we know that trying to get the administration to fund new faculty is harder than getting blood from a stone) and to give me time to do what I love most...research.

After 32 years at NMT, I have a bunch of skeletons in my file cabinet (in the form of unfinished manuscripts waiting for me to finish). I have two funded NSF grants and two proposals pending with NSF (it is hard to stop writing proposals for Antarctic research as there is so much

good science to do down there). The NSF-Mount Erebus Volcano Observatory (MEVO) award has funds for four more field seasons on Erebus (last Austral summer was the first year of this award).

So this is not yet the time to reflect on the past wonderful and enjoyable 32 years at NMT, but it is still a time to look forward to a few more productive years in EES as a potential Research Professor.

For all the 25 graduate students that I have supervised and have been in the field with on Antarctic research projects, it has been fun, and I hope it was an enriching experience for you. For the nearly 50 graduate students I have been proud to call mine, if you think about the good days in Socorro, I am sure you will remember EES in its heydays. We need your moral support now to keep it going!



*Pictured above: Phil sports a new facial growth during a 2003 trip to Antarctica.*



*Pictured left: Phil teaches his students how to blow their noses Kivi style during a 1989 trip to Hawaii for a volcanology seminar. Photo courtesy of Ellen Santistevan.*

*Pictured below: This photo was taken by Clive Oppenheimer during a 2005 trip to Antarctica.*



*Pictured left: Phil bravely approaches a pahoehoe flow to grab a sample on his rock hammer during a 1989 trip to Hawaii for a volcanology seminar. Photo courtesy of Ellen Santistevan.*



## *Jolante van Wijk Ingar Walder, Visiting Faculty*

## *End-of-the Year Student Awards*

(Continued from pg. 1)

continental rifts and rifted margins.

We use (industry) data to perform petroleum system analyses of basins, such as the Uinta Basin in Utah and the cratonic Williston basin. We also do general basin modeling studies to understand the thermal and subsidence history of a variety of basins.

Again, I am excited to collaborate with outstanding EES students and faculty. Thank you to our alumni for your generous support of the work we're doing.

(Continued from pg. 1)

classes for the Mineral Engineering department on mine waste management, and co-advised students.

I moved back to Norway with my wife in 2001 to establish a privately-funded research and education center. The center ([www.krec.no](http://www.krec.no)) is focused on mineral dissolution issues in connection with mine waste, mineral leaching, and CO<sub>2</sub>-mineral sequestration. The foundation of the research work is very much based on the great education I got from New Mexico Tech.

When the possibility to teach at NMT arose, I was excited about being in an active research department learning new things, giving some knowledge back to students, and building collaborations. One of my goals with this one-year appointment is to estab-

lish a research group at Tech focused on the geochemical and hydrological processes in leach piles, waste rocks, and in-situ leaching, and use this research knowledge to improve leaching processes (or reduce the environmental impact) via improved laboratory testing and reactive transport modeling. I am also initiating a new class in Environmental Geochemistry of Ore Deposits in the department, a class that we hopefully can continue in the future.

Once again, it is great to be back with the department. It is wonderful to go to the weekly seminars, discuss research with colleagues in different fields, and teach classes to students that are laying the foundation of their future careers. I would also like to thank our alumni for your generous support of the work we're doing.

**"The foundation of the research work is very much based on the great education I got from New Mexico Tech."**

**-Ingar Walder**



*Jennifer VanHouter (B.S. Earth Science, Geology Option) heads towards the stage to accept her diploma at graduation, May 2013.*

### **Spring 2013 E&ES Undergraduate Degrees Awarded**

**B.S. in Earth Science with Geophysics Option**  
Ashley Christine Hutton

**B.S. in Environmental Science with Hydrology Option**  
Amy Nicole Reed

**B.S. in Earth Science with Geology Option**  
Jennifer VanHouter

At the end of the 2013 spring semester, outstanding undergraduate and graduate students were recognized with awards from the New Mexico Geological Society (NMGS), the Carlsbad Gem and Mineral Club (CGMC), the Albuquerque Gem and Mineral Club (AGMC), and the Earth & Environmental Science Dept. with the help of generous contributions from alumni and friends of the department.

Highlights included the NMGS Senior Scholarship to Jeremy McComas, the CGMC Road Runner award to Lydia Molby, and the AGMC award to Luke Blom. Amy Jordan and Dave Parmelee were recognized by the department for their outstanding efforts as Teaching Assistants.

### *Two Students Win Appreciation Awards*

Hydrology M.S. student Amy Galanter and Geology M.S. student Drea Killingsworth received 2013 Student Appreciation Awards at an annual banquet in May. According to Thomas Guengrich, "These awards were created 15 years ago to recognize outstanding students and clubs demonstrating generosity of spirit and performance above and beyond the call of duty." Both students were nominated for the award by their advisors, Dan Cadol and Phil Kyle, respectively.

Visit [www.nmt.edu/2013-news/4781-eight-students-garner-2013-appreciation-awards](http://www.nmt.edu/2013-news/4781-eight-students-garner-2013-appreciation-awards) to read Guengrich's full news article about the awards.



## Recent E&ES Graduate Degrees Awarded

### Graduate Certificate in Hydrology

*Jessica Rose Schwartz, Hubbling*

### M.S. in Geology

*Stefan P. Raduha*—“Influence of Mesoscale Features of the Reservoir-Caprock Interface on Fluid Transmission into and through Caprock”

*Zachary Vance*—“Mineralogy, Geochemistry, and Genesis of the REE-Fluorite-Ag-Pb-Cu Ore Deposits of the Gallinas Mountains, New Mexico”

*Matthew Sophy*—“Geothermal Exploration of the Winston Graben, Central New Mexico, USA”

*Laura Jones*—“Terrestrial Laser Scanning (TLS) Observations of Erebus Volcano, Antarctica: Insights into the Near-Surface Magmatic System”

### M.S. in Geochemistry

*Michaella J. Gorospe*—“Uranium Mobility in Vegetation, Soils and Water below the Jackpile Uranium Mine, New Mexico”

### M.S. in Geophysics

*Katherine E. Anderson*—“Search for Distinct Rupture Variability in Source Properties of the February 27, 2010 Maule Mw 8.8 Earthquake: Evidence for Post-Mainshock Temporal Variations”

*Jacob Fortner Anderson*—“Mapping Thunder Sources by Inverting Acoustic and Electromagnetic Observations”

*Rebecca Lyn Johnson*—“Characteristics of Thunder and Relationships to Lightning Sources in the Magdalena Mountains, Central New Mexico”

*Emily A. Morton*—“Dynamic Earthquake Triggering above the Socorro Magma Body and Automated Event Detection in the 2009 Socorro, New Mexico Earthquake Swarm”

### Ph.D. in Geochemistry

*Lara Owens*—“Geochemical Investigation of Hydrothermal Systems in Iceland, New Mexico, and Antarctica”



*Pictured left:  
Emily Morton (M.S.  
Geophysics) poses with her  
advisor, Sue Bilek  
(Associate Professor of  
Geophysics), at graduation,  
May 2013.*



*Pictured right:  
Michaella J. Gorospe  
(M.S. Geochemistry)  
heads towards the stage  
to accept her diploma at  
graduation, May 2013.*

# Summer Field Stays Strong for 2013

**By Matthew Zimmerer**

Postdoctoral Researcher with NMBG,  
Ph.D. Geochemistry, 2012

The 2013 NMT Field Camp spent six weeks studying the amazing geology of northern NM. As a first-time instructor, I was excited to leave the lab-life behind and dedicate my energy to teaching students the various field-based geologic mapping techniques.

I, along with Field Camp Director Bruce Harrison and Department Chair Gary Axen, guided students through the process of mapping folded and faulted Paleozoic and Mesozoic strata near Las Vegas, NM, and their relationships to Quaternary landforms, terraces of the Chama River, and the metamorphic geology outside of Pilar, NM. On the rare free day, students were encouraged to enjoy the geo-scenery of NM, including the Montezuma

Hot Springs and hiking Wheeler Peak.

The NMT Field Camp is a well-recognized and increasingly important program in geoscience education. Twenty-five students attended this year's Field Camp. Over half of the class included students from schools other than NMT. Although the class is often considered the capstone geology course, more and more geology programs are opting to forgo teaching field camp due to high administrative costs. This fact combined with increasing undergraduate enrollment rates will ensure that the relatively inexpensive NMT Field Camp is a sought after class by many soon-to-be geologists!

*Pictured right: Field campers Dustin and Joe sport fashionable, yet functional, field attire at Abeyta Ranch, Las Vegas, NM.*



*After a 3,700 ft. elevation gain, nothing but smiles on Wheeler Peak (13,167 ft.), which is the highest point in New Mexico.*



*Everyone's balance is checked on an early morning primitive bridge crossing during the Wheeler Peak ascent.*

**Get the latest EES news by visiting <http://www.ees.nmt.edu/news>**



## Reusch Studies Melting on the Greenland Ice Sheet

By David Reusch

Associate Research Professor of Climatology

In mid-July 2012, satellite-based sensors recorded melting over nearly the entire surface of the Greenland Ice Sheet (GIS), even at elevations over 10,000 feet. This event was unprecedented in the 30-plus year satellite record and has been seen only a handful of times in ice core records going back 1,000 years. While nearly all of this melt simply refroze in place, and thus did not contribute to sea level change, we need to understand how and why these events occur so that we can better predict future responses to global climate change.

That's where my new \$411,000 NSF

grant comes in. Over the next three years, I will be working with colleagues at Penn State University (my Ph.D. alma mater) and the Universities of Maryland, Tennessee-Martin, and Georgia to use meteorological forecast models (kind of like those used to create your local weather forecast), satellite-based observations like those mentioned above, and climate models to understand the recent past and possible futures of GIS melting.

First, the satellite data will tell us where and when melt is happening on the ice sheet. Next, the meteorological models will give us a detailed picture of the weather in and around Greenland, so we can see what's happening in the atmosphere when melt is occurring (and, of

equal importance, when it isn't occurring). Lastly, the global forecasts that climate models will provide will allow us to use the detailed meteorological models both in the present and in the future. With these tools and data analysis techniques developed in a similar project at the other end of the globe (my West Antarctic surface melt project), we hope to learn more about the cause of recent melting and look into the future to see how it may change over the coming century.

We plan to share our experiences and results through a project web site. In the meantime, you can learn more about the GIS at <http://nsidc.org/greenland-today>.

## Wine Maps Water Usage on Tech's Campus

By Michael Wine

Ph.D. Hydrology Candidate

Michael Wine, a Hydrology Ph.D. student, is working with Dr. Jan Hendrickx to code a Python module for ArcGIS that can be used to map evapotranspiration at a resolution of 30 meters. Michael plans to use this code to determine how much water the plants that cover NMT's campus and golf course transpire. This will help determine how much water is being used by Tech.

Today, satellites—including Landsat 5, 7, and 8—that have both optical and thermal bands can be used to model spatial and temporal changes in evapotranspiration at a resolution of 30 m. One approach to modeling evapotranspiration from satellite imagery involves calculating an energy balance based on physical principles. It is well-known that a large, well-watered grassy park is cooler during the summer than a desert site. This difference in temperature is largely due to plants in well-watered areas using sunlight in transpiration; whereas, in contrast, in the desert there is less water to evaporate and incoming sunlight instead heats the land surface.

One challenge in modeling evapotranspiration from Tech's campus involves its complexity with buildings, shadows, footpaths, roads, parking lots, trees, grass, ponds, and a swimming pool all within a small area. Commonly, many of these features appear within a single satellite image pixel. These complexities make our project at Tech challenging and exciting. We hope that other groups worldwide that are trying to map evapotranspiration in urban landscapes will build upon our work on Tech's campus.

A range of factors, including population growth and climate change, are putting increasing pressure on water resources in water-limited regions worldwide. In states in the southwestern US, including New Mexico, water resource decisions are guided by the Prior Appropriations Doctrine. According to this doctrine, "Priority of appropriation shall give the better right." In other words, in times of water shortage, senior water rights holders' water needs must be fulfilled before junior water rights holders can receive any water allocation. Institutions and individuals that hold senior water rights are not allowed to use more than their allocated share of water; how-

ever, they are required—on average—to use the water allocated to them or risk losing their rights to said water. Modeling evapotranspiration at the field scale using satellite imagery is a good way to determine how much water is used, so that water rights holders neither lose nor under-utilize their water rights.



Michael Wine's (Ph.D. Hydro) project uses satellite imagery to map consumptive water use (evapotranspiration) on Tech's campus.

# Students, Faculty Learn and Work in the Field



Kevin Henry (B.S. Env. Science) stands next to a cut bank for scale in an arroyo near San Antonio during field work for the Socorro Magma Body (ERTH 432/GEOL 532) seminar class. The terrace exposure is composed of a thick deposit of fine-grained sediments interfingering with alluvial sediments that are overlain by ancestral Rio Grande deposits, indicating the presence of the Rio Grande west of its present location sometime in the past.

*Photo Credit: Brad Sion*

Pictured below: Stanislav “Stas” Edel (M.S. Geophysics) stands aboard the R/V Oceanus where he gained field experience recovering Ocean Bottom Seismometers (OBSs) with Cascadia Initiative Expeditions. He was at sea for five days off the coast of OR and CA and helped recover 15 OBSs.



Pictured below: Kylian Robinson (M.S. Hydro) and Stacy Timmons (NM Bureau of Geology employee) sample wells in Taos, NM. This work is part of a hydrogeology study of the southern Taos region, funded by Taos County and the Aquifer Mapping Program at the NM Bureau of Geology and Mineral Resources.

*Photo Credit: Paul Bauer*



Pictured below: Dan Cadol (Assistant Professor of Hydrology) and his daughter Abby (future hydrologist?) scout potential field sites in the Whitewater-Baldy Complex burn perimeter for a study of fluvial transport and deposition of pyrogenic black carbon and other fire debris.

*Photo Credit: Amy Galanter*





Pictured right: Junhao Hu (M.S. Hydro) counts the annual rings of a tamarisk on a Rio Grande bank for Dan Cadol's HYD 543 class, Ecohydrology.

*Photo Credit: Amy Galanter*



Pictured above: Jeff Pepin (M.S. Hydro) and Mark Person (Professor of Hydrology) take stream flow measurements for a project funded by the City of Truth or Consequences to assess the hydro-geothermal resources of the Hot Springs district.

*Photo Credit: Stacy Timmons*



Pictured above: Amy Galanter (M.S. Hydro) collects a water sample in Jamarillo Creek in the Valles Caldera. The water sample will be analyzed for black carbon resulting from recent wildfires in the area.

*Photo Credit: Emily Matthias*



Pictured left: Bill McIntosh (Associate Professor of Geochemistry; left) and Annelise Riggins (M.S. Geochemistry) analyze an episyenite dike in the Burro Mountains.

*Photo Credit: Nelia Dunbar*





Pictured above: Dylan Rose-Coss (M.S. Geology) will swing a sledge to act as a seismic source in a rock strength analysis conducted on nearly every unit in the Grand Canyon during the summer 2013 Advanced Field Camp.



Department of  
Earth and  
Environmental  
Science, New  
Mexico Tech

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Pictured above: Noah Stewart-Maddox (B.S. Earth Science; left) and Vanessa Ward (NMT Research Experience for Undergraduates (REU)) check to see if all electrodes are reading correctly during a resistivity test in El Rito, NM for EP-SCoR-funded research.

*Photo Credit: Elizabeth "Liz" Tysor*



Pictured left: NMT Research Experience for Undergraduates (REU) students Emily Matthias (left) and Erin Mavis indicate an incision in the hillside that was carved out by water runoff as they help Amy Galanter (M.S. Hydro, not pictured) analyze the movement of black carbon throughout the caldera after a recent forest fire.

*Photo Credit: Amy Galanter*



# Students Find Success at RMR and Plan for IBA Competition

**By Neil Currie**

**B.S. Earth Science, Hydrology Option**

Thanks to the generous donation by Chevron (see pg. 20) and funds from the American Association of Petroleum Geologists (AAPG), a group of six EES graduate students and two undergraduates attended the annual AAPG/Society of Exploration Geophysicists (SEG) Rocky Mountain Rendezvous Conference in Laramie, WY at the end of September. Jolante van Wijk traveled with the group as their faculty advisor.

During this conference, all of the students received interviews from various oil companies for potential internships and/or full-time employment after they graduate. Some students have since received offers. The students also had many excellent opportunities to network with company representatives, some

Tech alumni, and students and faculty from other universities.

One highlight of the trip was the students' participation in three of the short courses and field trips: the "Basin and Play Analysis/Mapping" course, the "Gulf of Mexico Exploration Lease Sale Experience," and the "Anadarko Oil Rig Tour." A few of the students presented posters during the poster session, which allowed for great networking opportunities.

Along with attending this conference, some of the students have been inspired to work with Jolante and other Tech faculty to participate in the next Imperial Barrel Award competition. To find more info. about this competition, visit <http://www.aapg.org/iba/>. Contact Jolante if you're interested in getting involved with EES's competition efforts: [jvanwijk@ees.nmt.edu](mailto:jvanwijk@ees.nmt.edu).



Some of the RMR attendees pose for a group photo—from left: Jenna Donatelli, Jolante van Wijk, Dylan Rose-Coss, Neil Currie, Kellie Kerner, Charlene Gonsalves.

# Blast from TECHtonics Past: 30 Years Ago...

## PERSONALS

Single male, pleasingly overweight, age 23 blonde, witty and charismatic desperately seeking single...available thesis title. Thesis is written and awaiting match. Object: graduation. If you think you have what it takes send your title in a stamped self-addressed envelop to John Bauch, c/o TECHTONICS. Photo and phone a must.



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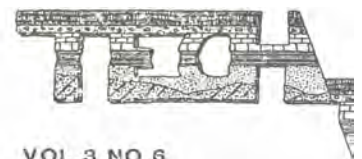
## NEW GEOLOGY FACULTY

New Mexico Tech has gained a new geologic faculty member. Andrew R. Campbell will be beginning as an Assistant Professor for the Fall, 1983 or Spring, 1984 semesters following his receipt of Ph.D. from Harvard.

**VOL. 3 NO. 4**  
Mar. 20-Apr. 2, 1983

## PRECAMBRIAN PUBLICATIONS, INC.

Those of us who know Dr. Kent Condie best as our Archean Anchorman and geochemist par excellence, may be surprised by the scope of this recently completed book entitled the *Evolution and Origin of the Earth*. His new book is intended for geology students receiving the second half



**VOL. 3, NO. 6**

## PROFESSOR PROFILE

Dr. Philip R. Kyle, our resident Kiwi volcanologist/geochemist, was born of two Kiwi parents in New Zealand. He passed a relatively normal childhood/adolescence, highlighted by episodes of fruit-picking and assorted mischief. He spent ten years at Victoria University in Wellington,



this comprehensive work is enhanced by over 500 figures including numerous rare photographs painstakingly obtained from colleagues around the world. DeDe Aguilar, Technical Secretary for the department, aided in typing the textbook into the computer.

With completion of his new book under his belt, Dr. Condie has thankfully returned his full attention to his numerous research interests. These include further studies of the

# NMT EES Alumni Spotlight

## *Deju Fosters Entrepreneurship at Tech and Beyond*

Raul A. Deju (B.S. Math, 1966; Ph.D. Hydro, 1969) retired in 2011 from a career as CEO or President of various science-based large companies to create the Institute of Entrepreneurial Leadership at John F. Kennedy University in the San Francisco Bay Area. Two years later the Institute has graduated 105 student companies. The companies have now reached several hundred million dollars in total revenue, and many have demonstrated substantial growth since taking the program.

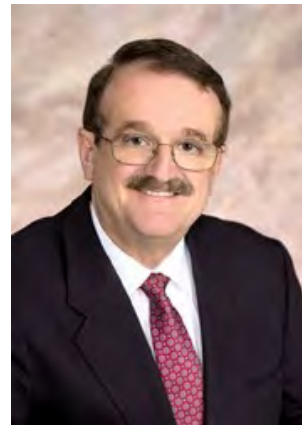
One of the courses offered by Dr. Deju is aimed at improving the outcomes of Service Disabled Veteran Owned companies. Dr. Deju taught a boot camp class on entrepreneurship this past summer at Tech, and several of the students

are actively moving to launch their companies.

Dr. Deju's retirement has also been active in the writing front. In early July 2013, his new book *Planet in Conflict* was published. It is now available in print and electronic form. Check it out on Amazon or Kindle or at major booksellers. The book highlights the importance of the energy sector in cleaning the environment, growing the economy, and achieving social equity. This is Deju's sixth book, and it includes a Foreword from President Dan Lopez of Tech.

Dr. Deju was honored last May with the Distinguished Achievement Award of the New Mexico Tech Alumni Association and is the recipient of recognition by the City of San Francisco as one of the

25 Leading Hispanics in the San Francisco Bay Area. He lives in the Bay Area with his wife Shari. Dr. Deju has two sons and two grandchildren.



## *EES Alumni Relations and Fundraising*

### By Peter Mozley

#### Professor of Geology

With Andy Campbell's retirement, I'm taking over as alumni coordinator for the department. Andy did a great job in revitalizing our alumni outreach and brought back *TECHtonics* after a 15-year hiatus. Beth Currie has outdone herself in the production of this year's *TECHtonics* with a larger format, more photographs, and an expanded section for alumni news. The only serious problem with this issue is the lack of a suitably embarrassing/incriminating photo of Andy to accompany his retirement announcement.

I'm planning a number of alumni events for the coming year in association with national meetings. We will have our traditional alumni reception at the GSA Denver meeting later this month (Rio Grande Universities, Oct. 28, 7-10 p.m., Grand Hyatt, Mt. Elbert A). This reception is held jointly with UNM, NMSU, and UTEP and is always lots of fun—some years a bit too much fun. (I will try

to arrive early to stake out an NMT portion of the room so that you won't have to interact with those from lesser schools unless you are feeling charitable.) In addition, I will organize an alumni reception for the AAPG meeting in Houston in April and may also organize at least an informal event for the AGU meeting in December. Watch for emails to our alumni mailing list (email [earthenv@ees.nmt.edu](mailto:earthenv@ees.nmt.edu) to get on this list if you aren't already) about these events.

The ongoing financial constraints that NMT is operating under make your alumni contributions incredibly helpful. We use alumni funds to supplement the department's strained accounts in many ways. You can contribute either to a defined fund, where the money is allocated for a specific purpose, or to the General Alumni Fund. The main defined funds are: the Rob Bowman Fund to assist students in hydrology, the Dave Norman Fund to support research in ore deposits, and the Clay Smith Fund for student field projects and field travel. We use the Gen-

eral Fund for all sorts of activities that the department could not otherwise support. Recently, the General Fund was used to support student travel to various meetings and field trips (NMGS field conference, GSA Annual Meeting), and department social events, such as our annual awards dinner and faculty roast. It is also used to help with purchasing student field/lab supplies. If you have any suggestions for other ways for us to focus the use of alumni donations, please feel free to email or call me ([mozley@nmt.edu](mailto:mozley@nmt.edu), 575-835-5311). Given the current poor state of EES Department finances, now is a great time to donate!





### Alumni Fund Donors

Thank you to the following people, who have generously donated to the E&ES Alumni Fund since our last issue of *TECHtonics* (October 2012)!

**DIAMOND \$10,000+**  
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*See pg. 15 for a tax-deductible donation form. Your donations help support our students' education and research!*

# NMT EES Alumni Updates

\*Written by alumni with minor edits by *TECHtonics* staff for readability and/or typos.

*Stefan Raduha,  
M.S. Geology, 2013*

I have been training to become a JFE (junior field engineer) for Schlumberger. I am working in the open-hole wireline segment. Once I learn the ropes of wireline, I will be transferred to the data and consulting services segment of Schlumberger. I will use knowledge I gained from being a field engineer to improve my well log interpretation skills.

*Shasta Marrero, M.S. Hydro, 2009; Ph.D. Hydro, 2012*



*Shasta takes advantage of her surroundings by stopping in for a small bottle of Scotch whisky.*

After finishing my Ph.D. in June 2012, I spent my first year teaching undergraduate hydrogeology at SUNY Oneonta in New York. When I first moved there, they kept apologizing that I had to move to such a small town. However, it didn't feel small compared to Socorro—it had a movie theater with nine screens!

It's true that the first semester prepping classes and teaching is a bit overwhelming (I'm sure having 71 students didn't help!), but I loved it by the end of the year. I even had the opportunity to advise some amazing undergraduates as they worked on research projects. When my students won a "Best Poster" Award at the regional GSA meeting, it was such an amazing feeling! I made it back to Tech in time to walk in the graduation ceremony this year.

With hardly a break, I headed off to a post-doc at the University of Edinburgh where I'm running a cosmogenic chlorine-36 lab processing samples from blue-ice glaciers in the Ellsworth Mountains of Antarctica. I'm really looking forward to field work in Antarctica as well as two years of living in Scotland!

**Join NMT EES Alumni at GSA in Denver for the Rio Grande Universities Alumni Event on Oct. 28, 7-10 p.m. at the Grand Hyatt, Mt. Elbert A!**

## Cheryl Whitney, B.S. Earth Science, 2009

I am currently working in Denver, CO at Laramide Geosciences LLC., a petroleum consulting company. I also volunteer as one of four co-editors on the *Outcrop*, a monthly newsletter published by the Rocky Mountain Association of Geologists. *Outcrop* circulates to about 2,000 members and 200 university libraries. I will also be serving as the publications chair for the 2014 Annual Meeting of the Rocky Mountain Section of the American Association of Petroleum Geologists that will be held in Denver, CO in September 2014. This year I was engaged to Ryan Fountain, an alumnus of Oregon State University. We both love the Rocky Mountain Range and look forward to spending more time in the great state of Colorado.

*Email [earthenv@ees.nmt.edu](mailto:earthenv@ees.nmt.edu) with updates!*

## Geoffrey Marshall, M.S. Hydro, 2005



I'm still working as a hydrogeologist for the Planning and Investigations Unit of the Water Resources Authority of Jamaica. The major project I'm working on right now is in conjunction with the IAEA looking at isotope hydrology in the Upper Rio Cobre basin, trying to identify the various paths of subsurface flow using isotopes and water chemistry. It's fun and challenging work, along with the usual

daily tasks of small investigations and report writing. I've also become quite involved with Toastmasters International, and in June 2013, I completed my term as Division Governor with responsibility for all Toastmasters in Jamaica and the Cayman Islands.

## Vladimir "Vlad" Ispolatov, Ph.D. Geochemistry, 2001

I joined Barrick Gold Corporation as an exploration geologist in 2006 and have worked with Barrick since then, based in Canada, Australia, and most recently, the U.S. Since 2011, I have lived in Salt Lake City, Utah, with my wife Julie and two young daughters, Darya and Arina. My work as Senior Exploration Geologist involves classic "Boot Leather" field geology in the Great Basin.

## Jana Stankova-Pursley, M.S. Geophysics, 2008



*Jana stops for a photo while snowshoeing at Mills Lake in Rocky Mountains National Park.*

Last fall I started working at the National Earthquake Information Center, U.S. Geological Survey, located in Golden, Colorado. I'm part of a 24/7 group that analyzes and publishes real-time events in the U.S. and globally.

Besides event analysis, I provide information for the public and media through the NEIC website and phone interviews. My personal focus includes improving earthquake detection and analysis in the New England area. Earthquakes in

that part of the country are not very large or frequent compared to California; however, due to the crustal structure of the north-eastern U.S., they are felt over a much larger area.

## Danielle E. (Shapo) Jannusch, B.S. Geology, 2001



After completing my B.S. at NMT, my husband Mark (former NMT EE major), Hannah (our then 3-year-old, now high school sophomore), and I left New Mexico for Iowa. I began teaching geology, paleontology, and evolutionary biology at the University of Iowa, Iowa City, while completing my M.S. (2003) and Ph.D. (2008) on the taxonomy and faunal changes of Middle Devonian

stromatoporoids. Our second child, Jannusch 2.0 (a.k.a. Alex), was born in February 2007.

Fast forwarding a few more years... We currently live in Marion, IA. Mark is a Senior Systems Engineer at Rockwell Collins, and I enjoy teaching science, math, critical thinking, and student success classes online and at local colleges. In December, I will receive my Iowa Teaching Certificate in secondary science and math with the hopes of teaching middle school science next year. [dejannusc@yahoo.com](mailto:dejannusc@yahoo.com)



## *Emily (Desmarais) Montgomery-Brown, B.S. Geology, 2002*

I graduated with a Ph.D. in Geophysics from Stanford University in 2009. I was a visiting researcher at the Earthquake Research Institute at the University of Tokyo and continued on to a post-doc at the University of Wisconsin, Madison. Currently, I am a Mendenhall Post-doc at USGS in the Volcano Science Center and am living in the San Francisco Bay Area with my husband and two young children.

## *John Hingtgen, B.S. Geology, 1985*



I work in electricity supply analysis for the California Energy Commission. My work here focuses on forecasting electric generation supply for grid planning, system reliability, and integration of renewables. Formerly, as a project manager in the energy research & development division of the Commission, I managed R&D to develop new technology for wind, geothermal, solar, and other energy generation. After using my B.S. in geology from NMT for many

years, I returned to school to earn an M.S. in energy from the U. of Wisconsin. Before graduate school, I worked at the County of Orange, Fluor-Daniel Inc., the National Radio Astronomy Observatory, NMBM&MR in Socorro, and the Los Alamos National Lab. I can be reached at: [john.hingtgen@energy.ca.gov](mailto:john.hingtgen@energy.ca.gov).

## *Charlotte Rowe, B.S. Geology, 1981; Ph.D. Geophysics, 2000*



I'm still a seismologist at Los Alamos National Lab. I am also adjunct faculty with EES at Tech and at UNM. I still live in Santa Fe with my cats and dog, and my horses are boarded in Espanola.

*Pictured left: Charlotte stands in front of the Bocca Nuova crater on top of Mount Etna.*

## *Robert G. Taylor, M.S. Hydro, 1997*

I am spending my Forest Service hydrology career modeling post-fire landslide risk, keeping high water quality flowing to southern California, and doing water quality assessments and BMP monitoring for multiple uses. My wife, Jen, homeschools the two kids, Allison (11) and Nathan (8). We recently celebrated our 18<sup>th</sup> wedding anniversary.

## *Ellen (Limburg) Santistevan, M.S. Geology, 1990*



I haven't worked as a geologist since 1992, but I now have a practice doing therapeutic bodywork in Albuquerque.

*Pictured left: Ellen works on one of her clients in Albuquerque.*

## *Dan Wieder, M.S. Geophysics, 1981*

I recently retired from ConocoPhillips in Houston and moved back with my wife, Becky, to San Diego to the house where I grew up. We moved back to San Diego to assist with my dad and because it is one of the best places in the country. I had worked for 22 years with Phillips Petroleum in Bartlesville, Oklahoma and with ConocoPhillips in Houston for 8 years after they merged. I started off as a geophysicist and retired as a Systems Analyst, managing the large linux cluster that is used for Seismic Processing. Presently, I am doing contract work with the same group at ConocoPhillips that I worked with, although now I am working part-time, easing into retirement.

We also spend our time volunteering with two main groups in San Diego: The Point Loma Association and Cabrillo National Monument. We spend a lot of time being docents in the Tidepool area of the park. Both Becky and I have spent a lot of time out there since high school, and it's nice to be able to come back and spend time educating the public. You would be hard pressed to find better scenery than at Cabrillo National Monument. We also have a surviving daughter in Oklahoma that we hope to get out here one day. We spend a lot of time worrying about her and her husband during tornado season.

## Linda Trocki, B.S. Geology, 1976



Los Alamos National Lab was my home base for about 20 years after working there as a co-op student while at Tech. I took a leave from Los Alamos early in my career to work for the International Atomic Energy Agency in Vienna, Austria. Upon returning from Vienna, I obtained an M.S. in Geochemistry and a Ph.D. in Mineral Economics at Penn State.

For the next 15 years, I worked on energy and environmental technology assessment, eventually becoming Los Alamos' senior manager for this area. I worked in Washington for about a year as Special Assistant to the Deputy Secretary of Energy and in Houston with Chevron R&D before joining Bechtel Group in 1996 in San Francisco as Vice President and Manager of R&D. I retired from Bechtel in 2009 after serving in a few senior management positions. I live in Tiburon, California with my husband Peter Marguglio and enjoy travel, golfing, hikes, and volunteering with Audubon California. I am also on advisory committees for Penn State and the Buck Institute.

## Allan "Al" Cooper, B.S. Geology, 1973

I took early retirement from Asarco in 2007, and I am currently working for Freeport-McMoRan Reclamation Services on projects at Twin Buttes, AZ, Copperstone, AZ, Newmire, CO, and Bisbee, AZ. I am also doing volunteer work with the Order of the Arrow, Boy Scouts of America.

## Nathan Columbus, M.S. Hydrology, 1964

Recently, I have been retained by the Water Utility of Tegucigalpa (Capital of Honduras) to advance and enhance the construction of sewage treatment plants and conveyors of sewage in a place where only 16% of the sewage is being treated. The objective is to embark on a plan to get over 90% of the sewage of the capital city of Tegucigalpa treated and disposed in an orderly way and, thus, improve health conditions and the environment. In Brazil, where I am also involved, sewage treatment has already achieved the position where in the big industrial areas of SAN Paulo and the Petrochemical center of Salvador Bahia, it is being treated for reuse in cooling towers and other processes, as the cost of water soared and it became viable.

## Roger Dayton Smith, M.S. Geophysics, 1974



Roger in Papua New Guinea with his helicopter refueler.

I've had an interesting career in geophysics working oil & gas, geothermal, and engineering. I've worked most of my career as an independent geophysical consultant. A preponderance of these projects was overseas in many interesting places and cultures. I have always wanted to see the world and have somebody else pay for it.

I have enjoyed my career so far. Being outdoors, seeing new things, and experiencing cultures have been the best part of my degree. Seems more like play than work. Sue also says hello—she is still putting up with me. Would love to hear from my "old" friends from NMT: (303) 279-6958 or r13roger@msn.com.

## Daniel Blodgett, M.S. Geology, 1972

I am currently being treated for multiple myeloma, a bone marrow cancer. I have improved greatly and look forward to returning to work in the fall at my job teaching family medicine residents in Fresno, CA. My daughter, Eva Levi, graduated from NMT in 2006 and is currently finishing her PhD from U. of AZ in ecology while living in Las Cruces with her husband Matt. I hope to visit Socorro in the next two years. I can be contacted at blodgetmd@sti.net. My wife Valerie and I live in the beautiful foothills of the Sierra Nevada range.

## Leland "Tim" Long, M.S. Geophysics, 1962

I recently published my book *Acquisition and Analysis of Terrestrial Gravity Data* (a description of the book is available from Cambridge or Amazon.com). I brought one of my former students in as co-author to add more recent developments in near-surface gravity data acquisition. While most of my research has been in the area of seismic data analysis, microearthquakes mostly, this seemed a good way to pull together my experience in gravity data acquisition and analysis.

*Editor's Note: Long is Professor Emeritus of Geophysics at Georgia Institute of Technology where he taught for over 40 years.*



# Alumni Update and Tax-Deductible Donation Form

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Web page \_\_\_\_\_ Year(s) graduated \_\_\_\_\_ Degree(s)/Major(s) \_\_\_\_\_

Employer \_\_\_\_\_ Job Title \_\_\_\_\_

PLEASE SEND US YOUR NEWS!!! Use this form or email us at earthenv@ees.nmt.edu.

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## *Chevron University Partnership Program Gives \$15,000 to EES*



*Ben Rosandick (M.S. Geology; right) enjoys his Summer 2013 internship with Chevron.*



Thank you to the Chevron University Partnership Program for your generous donation of \$15,000 towards NMT EES student scholarships and clubs.

These funds will benefit current EES undergrads and graduate students in the form of academic scholarships, financial support for conference travel, such as the AAPG and SEG Rocky Mountain Rendezvous; AAPG, SEG and Earth Science Club (ESC) speakers; and other AAPG, SEG, and ESC activities.

Both Chevron and EES hope to continue growing this relationship that benefits our students in the form of support and collaboration and Chevron in the form of well-prepared future employees!



*Paige Czoski (M.S. Geology) enjoys some well-deserved time-off in Switzerland after her Summer 2013 internship with Chevron.*