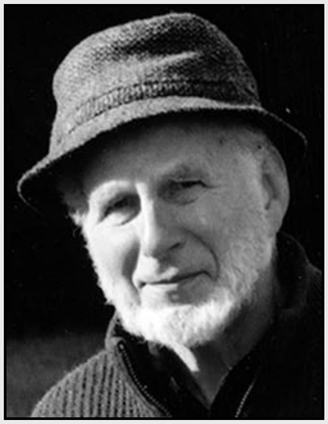
PENROSE MEDAL

Presented to Minze Stuiver



Minze Stuiver
University of Washington

Citation by Donald J. Easterbrook

Minze Stuiver was born in Vlagtwedde, Groningen, The Netherlands. He received his M.S. degree in experimental nuclear physics and mathematics from the University of Groningen in 1953 and his Ph.D. in biophysics from the University of Groningen in 1958. The direction of Minze's career was strongly influenced by his association with Hessel de Vries, professor of physics at the University of Groningen. De Vries started him on the way of developing and applying state-of-the-art physical measurement techniques to biological and environmental processes through rigorous mathematical analysis.

In 1959, Minze went to Yale University as research associate and postdoctoral research fellow at the Geochonometric Laboratory, where he developed the Yale 14C laboratory. In 1962, he became senior research associate and director of the Yale Radiocarbon Laboratory.

In 1969, he moved to the newly founded Quaternary Research Center at the University of Washington where he built the Quaternary Isotope Laboratory and was its director until his retirement in 1998. Minze's proportional CO_2 counters, placed in a specially constructed underground laboratory, made Seattle the world leader in precision and range of radiocarbon dating. Reviving the pioneering work on thermal diffusion isotopic enrichment of ^{14}C, initiated by De Vries in the 1950s, Minze set the world record for the oldest ^{14}C measurement and contributed to our knowledge of the timing of early glacial climate variability. Pushing his K-Ar system to younger ages, he was able to overlap the ranges of these two methods.

His early work involved short-term variations in atmospheric radiocarbon and their relationship to changes in the solar magnetic field was groundbreaking and his measurements were state of the art. His research on solar activity through study of ^{14}C in tree rings has had a major impact on solar and atmospheric research. Careful analysis of the atmospheric ^{14}C fluctuations, revealed by the high-precision ^{14}C calibration record, allowed Minze to demonstrate the role of the sun in modulating the production of ^{14}C (Maunder, Sporer, and Wolf sunspot minimum). He also translated the atmospheric ^{14}C calibration curve to oceanic reservoirs. The atmospheric ^{14}C calibration provided via its modeled production modulation is an indication of solar activity over the past 12,000 years.

He also used radiocarbon to trace the pattern and timing of deep-ocean circulation. His highly precise measurements of the ^{14}C to C ratio in inorganic carbon in sea water greatly advanced understanding of the rates of ventilation of the deep sea and established the role of mixing in the southern oceans as an important aspect in the "aging" of seawater. The gradual change in ^{14}C concentration in deep waters, going from the North Atlantic to the Antarctic circumpolar current and from there into the Indian and the Pacific oceans provided an early demonstration and quantification of the deep part of oceanic circulation.

Minze was a key player in the all-important GISP2 ice coring project in Greenland. He produced the basic oxygen isotope measurements that served to define the abrupt Greenland climatic changes. He was the first to recognize the problem of seasonality in this record and he also made fundamental investigations of the role of the sun in the Holocene changes recorded in the Greenland core.

An important part of his research involved meticulous, high-precision dating of ancient tree rings that allowed calibration of radiocarbon ages to calendar ages that led to the widely used computer program (CALIB) for calibration of radiocarbon dates. Minze demonstrated the importance of solar influences on terrestrial production rates of radiocarbon in calibrating radiocarbon ages and gave an early indication of significantly higher atmospheric ^{14}C levels during the glacial to interglacial transitions. His 1993 radiocarbon calibration paper is the most-cited geoscience paper of the 1990s, and he has been named the most-cited geoscience author in the past decade.

To expand his paleoclimatic research into ice core analysis, Minze obtained a high-quality mass spectrometer system for $^{18}O/^{16}O$ analysis. He and P.M. Grootes produced ^{18}O records for the tropical Quelccaya ice core in Peru with Lonnie Thompson, the J-9 core and the Taylor Dome core in Antarctica, and the historic GISP2 core in Greenland. These records contributed to our understanding of the climate signal in tropical glaciers and North-South climate connections. The GISP2 ^{18}O record provided one of the fundamental climate indicators and confirmed and quantified the many, extremely rapid, large, climate changes, first seen in the Younger Dryas/Preboreal transition and then found elsewhere in the last glaciation.

The significance of the new technique of mass spectrometric measurement of ^{14}C using nuclear accelerators (AMS) was recognized by Minze early on. He and Grootes developed AMS at the University of Washington with applications to the direct dating of pollen, ^{14}C in tree rings, corals, and atmospheric methane. By adding stable isotope mass spectrometry of carbon ($^{13}C/^{12}C$) and oxygen ($^{18}O/^{16}O$), he developed the tools to quantify changes in the hydrological and in the carbon cycle, related to climatic changes in the past. Mass spectrometry of $^{13}C/^{12}C$, needed for the ^{13}C fractionation correction of ^{14}C concentrations was developed into an independent tool to quantify the anthropogenic input of CO_2 into the atmosphere (Suess-effect). In a study spanning the Pacific Coast from Chile to Alaska, Minze was able to quantify the man-induced change in atmospheric ^{13}C concentrations over time and thus helped quantify the history of the greenhouse gas, CO_2. His critical analysis also showed the pitfalls, awaiting those who want to use tree rings for this type of study, by identifying strong influences such as the juvenile effect, canopy, exposure, and growth rate on the ^{13}C isotopic composition. Together with his student Bob Burk, he demonstrated the use of oxygen in cellulose as a paleoclimatic indicator, dependent on latitude, temperature and relative humidity.

Over the past 40 years, Minze Stuiver has published 195 papers in radiocarbon geochronology, calibration of radiocarbon and calendar ages, use of radiocarbon as a tracer to assess the pattern and timing of deep-ocean circulation, and studies of polar ice cores. His work was previously honored by the 1983 Humboldt Award from Germany, the 1994 Pomerance Award of the Archaeological

Institute of America, and the 2000 AMQUA Distinguished Career award in Quaternary Science. He has produced a body of work unrivaled in the field of geochronology and unequaled in its interdisciplinary applicability.

Response by Minze Stuiver

The Penrose award is very much appreciated. Being in the United States for the past 46 years has been a great experience for myself as well as spouse Anneke, and I thank GSA and all our friends very much for the nomination and citation.

With only a two-day head start on the Great Depression my entry in this world was not very auspicious. And to add insult to injury my high school years in Almelo, the Netherlands, were drastically influenced by a German occupation that lasted 5 years. The school became "home" to a couple of hundred soldiers and I remember classes, if they were given at all, in the public library, a bathhouse, and a textile factory. The teachers also had to compete with the harsh sounds of airplanes, sirens, occasional bombs and German propaganda on loudspeakers. My hat off to those teachers because it is utterly amazing that so many of their students did well in our present society.

My parents were Friesians, and Friesian was spoken at home. The Friesian language is much older than Dutch and is more related to English. During the war I spent many summers with relatives in Friesland because only in that province was sufficient food for a hungry teenager. An important Friesian in U.S. history is Peter Stuyvesant, the last governor of New Amsterdam. A good description of his ancestry is given by Russell Shorto in his "The Island at the Center of the World". W.F.Duisenberg, the "father of the Euro", and Mata Hari, whose name became a synonym for female spy, also were Friesians.

Post-war university life in the city of Groningen was peaceful. One of the students in our physics department was Abel Tasman, a descendant of the European "discoverer" of New Zealand. And, although I did not realize it at that time, there was a hint of Dutch–American ties. Maarten Schmidt, now a well-known astronomer at Mt Wilson and Palomar Observatories, was a co-student in my astronomy class. And Dutchman Vening Meinesz, known for his gravity measurements in submarines, was a recipient of the Penrose award in the nineteen forties.

The trouble with old age is that there is too much past to describe. Fortunately, there is radiocarbon dating as a tool for deciphering the past. The methodology is nearly sixty years old and has undergone substantial improvements during those years. Sample size has been reduced from tens of grams to milligrams and precision has improved from centuries to decades. Only marginal improvement has been made in the maximum age range due to modern ^{14}C contamination in samples and equipment lines. The ^{14}C isotope, after all, disappears from the scene with a half life of 5730 years and for the maximum age of about 60,000 radiocarbon years less than 0.1 percent of the original ^{14}C is left to measure.

Samples of known age are needed for the conversion of radiocarbon ages to calendar year ages. Even though precision has improved over time, the best precision is still achieved using fairly large (~10 g C) samples of tree-ring dated wood (up to 12,000 years old) in gas counters. The combined measurements of several laboratories generate an internationally accepted calibration curve that converts a radiocarbon age to a cal (calibrated) age range. With high precision dating the cal age range can be limited in many cases to one or two decades. For instance, a major earthquake in the Seattle region was radiocarbon dated as between AD 1695 and AD 1710. Japanese historical tsunami data ultimately provided an AD 1700 historical year (Brian Atwater, this meeting).

Isotopes play important roles in the Earth sciences. My own work was on ^{13}C, ^{14}C and ^{18}O. ^{14}C, of course, is not solely used for the determination of time. There are many other applications, ranging from abyssal ocean depths to surface conditions of the Sun. Because the ^{14}C production in the upper atmosphere is modulated by the solar wind variations in atmospheric ^{14}C content occur that can be measured in tree-rings. The changes in tree-ring ^{14}C yield a history of cosmic ray flux modulation by the Sun. Such a record is important for estimating past solar induced climatic change. Other applications focus on global ocean circulation (deep-water residence times), carbon transfer between atmosphere, biosphere and oceans (using 20th century nuclear bomb ^{14}C and fossil fuel (^{14}C free) carbon dioxide signals) and global deforestation rates.

Condensation temperature determines the ^{18}O /^{16}O ratio of precipitation. In ice cores this ratio mirrors climate change over long time intervals. Ice is not the only medium for this type of research, calcium carbonate in lakes (marl) and oceans (deep sea sediment and corals) as well as tree-ring cellulose can be used.

Large programs like GEOSECS with its worldwide ocean sampling, Taylor Dome and GISP-2 with kilometer long ice cores, and CALIB with thousands of tree-ring samples are now part of history, but not entirely forgotten. The lasting legacies are the data sets and the widely used CALIB calibration program. There also have been many interactions with colleagues and students during my career (AD1950 – 2000, give or take a couple of years) and these exchanges contributed substantially to the Penrose award. Unfortunately, a listing of all names would blow GSA editorial policy to pieces and a partial listing is dangerous territory (so I am told). Nevertheless, I like to acknowledge as mentors Hl de Vries, E. S. Deevey and A. L. Washburn, and as superb students Paula Reimer, T. Braziunas, R.L.Burk and E. Steig. And citationist Don Easterbrook, with much optimism, made this event a reality.

ARTHUR L. DAY MEDAL

Presented to Donald W. Forsyth

Donald W. Forsyth
Brown University

Citation by Sean C. Solomon

Don Forsyth is an extraordinarily innovative geophysicist who has made seminal contributions to an unusually diverse sweep of topics. Don has a knack for clarifying a problem, distilling its elements into logical ideas, and marshalling the observations needed to distinguish among those ideas.

More than any other individual, Don has defined the seismic structure of oceanic lithosphere, its variation with seafloor age, and the anisotropic characteristics of oceanic mantle and their implications for plate formation and evolution. With Frank Press, Don showed how petrological models for oceanic lithosphere could be distinguished on the basis of a comparison of predicted and observed seismic properties versus age. He then applied age-binned Rayleigh and Love wave phase velocity measurements to improve the resolution of models for the shear-wave velocity structure of oceanic lithosphere. His work, later joined by his student Clyde Nishimura, established the age dependence of both the isotropic and anisotropic shear wave structure, limited models for the thickening of the lithosphere with age, and elucidated patterns of azimuthal and polarization anisotropy versus age that constrain the spreading process at ridges and the pattern of asthenospheric flow. In the course of that work he developed novel analysis methods for multi-mode surface waves, and he perfected appropriate inversion methods.

Not content with data that could be gathered from land seismic stations, Don led the first modern marine seismic experiment to deploy a network of ocean-bottom seismometers to measure the shear-wave velocity structure of young oceanic crust and mantle. The MELT (Mantle ELectromagnetic and Tomography) experiment was a pioneering effort in marine seismology, because it demonstrated that seafloor seismic instruments deployed from a ship could recover long-period seismic waves suitable for the analysis of surface wave dispersion, shear wave splitting, receiver functions, and mantle tomographic imaging. Again, Don had to develop a new inversion method to accommodate multipathing in the recorded surface waves, a method subsequently utilized by many others. The MELT experiment provided what is now the type structure for a region near a super-fast spreading ridge, demonstrated that the fast direction of shear wave propagation is parallel to the spreading direction in such a setting, and documented an asymmetry in seismic structure across the East Pacific Rise axis interpreted convincingly by Don as a signature of enhanced asthenospheric return flow from the region of the South Pacific Superswell. Equally importantly, MELT opened the door to other long-term deployments of ocean-bottom seismometer experiments to address mantle dynamical problems in diverse oceanic settings.

Don led one of those follow-on experiments (GLIMPSE) to tackle the origin of linear chains of seamounts and volcanic centers aligned with the spreading direction on young portions of the Pacific plate. Through a combination of seismic measurements, gravity anomalies, and bathymetry, Don discounted both of the hypotheses previously advanced to account for such volcanic chains—small-scale convection in rolls aligned by plate shear, and lithospheric extension perpendicular to the spreading direction. Don instead advanced the new idea, based on laboratory measurements of two-component fluids, that the volcanic chains are signatures of the viscous interfingering of enriched material upwelling and diverging from the Superswell region with normal oceanic asthenosphere.

Don's influential contributions extend in many other directions. With Seiya Uyeda Don carried out the first formal inversion of tectonic plate speeds for the forces that contribute to plate motions. That work demonstrated clearly that plate speeds are controlled by plate subduction, and that the driving force of sinking lithospheric slabs is nearly fully opposed by resisting forces at overthrust plate boundaries and viscous tractions on the subducting plate.

With Bill Chapple and later alone, Don elucidated the nature of lithospheric flexure at trench outer rises. Whereas others had noted the flexural nature of outer rise topography and gravity anomalies, Don shrewdly turned to what could be learned from the mechanisms and focal depths of outer rise earthquakes. He showed persuasively that earthquakes above and below the lithospheric neutral plane divide by focal mechanism (normal faults at shallow depth, thrust faults at greater depth) in precisely the manner expected for a flexed plate, and he derived new constraints on the thickness and properties of the mechanical lithosphere from those observations.

With several colleagues Don explored the three-dimensional structure of oceanic crust along spreading ridge-transform boundaries and the implications of those structures for patterns of mantle upwelling, melt generation, and melt delivery to crustal levels. His work involved a masterful synthesis of geophysical and geochemical data with numerical models of three-dimensional flow and melting. Don was the first to calculate the mantle Bouguer gravity anomaly for mid-ocean ridges, to strip the effects of constant crustal thickness from the Bouguer gravity field. He discovered bull's-eye lows centered on ridge segments that he attributed to along-axis variations in crustal thickness and mantle density. Don's methodology has since been widely adopted in other studies of spreading center systems.

On top of those contributions, Don invented the spectral coherence method for inferring the thickness of the elastic lithosphere in continental regions where variable erosion has rendered the admittance method inapplicable; he developed techniques for combining results from multiple fault-plane solutions in a region to derive rigorous estimates of principal stress directions; and he elucidated constraints on the vertical extent of mantle partial melting beneath mid-ocean ridges from crustal thickness and major element chemistry of erupted magmas.

It is my pleasure to introduce Don Forsyth as the 2005 Arthur Day Medalist.

Response by Donald W. Forsyth

Thank you Sean for the generous citation and for taking time out of your busy schedule to attend this ceremony. As a more senior graduate student, Sean was one of my role models when I first arrived at MIT after graduating from a small college in the Iowa cornfields. By example, he taught me how to stay up all night before a conference or an abstract deadline and how to prepare figures with a balky Leroy ink pen. Thank goodness those days are gone, at least the dealing with clogged pens or ink spills. Now we get to struggle with printers that cut off the last 6 inches of your poster.

In reading over the list of previous winners of the Day Medal, I have noticed another change that has taken place over the years. It used to be that winners were giants that strode the earth, heroes to a young scientist like me. Medalists included my thesis advisor, Frank Press, and pioneers like Ewing, Birch, Hubbert and Bullard. Now the winners are simply colleagues and friends. What's changed of course is that now I can add the human dimension, like my memories of exchanging elbows with Dennis Kent on the basketball court, to the names and accomplishments. The human dimension diminishes the awe, but not the respect, and it increases the affection and appreciation. Like the time that medalist Rick O'Connell was my host when I tried to give a lecture at Harvard despite my having the flu - the predictable end result of that misjudgment definitely demonstrated my human side and his graciousness!

My wanderings through geophysics and geology in search of how the earth works have been delightful, greatly enhanced by the people who have joined me on parts of the journey. Maybe I wouldn't say this if I was a geochemist, but I have found that most of the people in this field are really nice. My early mentors, Joe Phillips, Frank Press and Seiya Uyeda, gently guided me toward important problems. Equally important in those early days were fellow grad students, including Sean, Keith Louden, Norm Sleep and Randy Richardson. After a stimulating three years in the seismology group at Lamont, I moved on to Brown University, where I have been for the last 29 years. Brown has been a wonderful place to work, with many bright students and congenial colleagues. I've worked most closely with Marc Parmentier and Karen Fischer, who share my interests in understanding convection, magma generation, and plate tectonic processes, but it is the atmosphere of the whole department that makes it a perfect fit for me. Shared lunches, a drive to explore fundamental scientific questions, a passion for excellence in teaching, and genuine caring for the well-being of the department and each other are part of that atmosphere.

Perhaps the most important companions on the journey have been my students, both undergraduates and graduates. They have shared struggles with faulty or inadequate data and a commitment to excellence, they have taught me how to get the printer to print out that last six inches of the poster, they have tolerated my nit-picking about words in manuscripts, and they have been willing to play with me. I can't mention them all, so I'll just say that they are all above average and that my most recent three grad students, Dayanthie Weeraratne, Yingjie Yang, and Nick Harmon, have been to sea with me and yet still have been willing to play volleyball with me on Friday afternoons.

One of my greatest sources of delight is the joy of exploration. I love finding out new things about the earth through analyzing measurements; what I think of as letting the data tell its story. But there is nothing more exciting than actual exploration. I've been lucky enough to participate in cruises to all the major oceans, putting down and recovering ocean bottom seismometers, but also just plain mapping the bathymetry, gravity and magnetic anomalies of previously unstudied parts of the mid-ocean ridge system. My wonderful companion on several of the cruises has been Dan Scheirer, a master of underway geophysical measurements who also loves exploring new territory.

Of course, a journey isn't much fun if you don't enjoy walking. There is a lot of seeming drudgery involved, removing glitches from data, or trying for the nth time to get a figure or calculation just right. Here it helps to have an aesthetic appreciation for the observations. I may have been brain-damaged from too many years of hand-digitizing analog seismograms, but to me, there is nothing more beautiful than a nicely dispersed Rayleigh wave.

So, I thank my friends for nominating me and the GSA for honoring me for what amounts to a walk in a fascinating park. I have been extraordinarily fortunate, but we are all lucky to live in an era and in a society that supports such endeavors.

YOUNG SCIENTIST AWARD (DONATH MEDAL)

Presented to
Demian Michael Saffer

Demian Michael Saffer
Pennsylvania State University

Citation by J. Casey Moore

Tonight Demian Saffer receives the Young Scientist Award for his outstanding contributions in the field of geofluids. His work at this multidisciplinary edge combines elements of geohydrology and tectonics, especially in the study of plate-boundary faults. His research integrates rigorous quantitative modeling with data collection and experimental work. For example, he has shown that the shape of tectonically constructed accretionary wedges at convergent margins is a reflection of sediment permeability. In his recent papers on the San Andreas fault, he has demonstrated that transport of mechanically generated heat by groundwater cannot explain the characteristic low heat flow of this fault. Thus, he furthered and clarified the argument for a so-called “weak” fault. In an important experimental study, he demonstrated that the smectite to illite clay transition cannot explain the upper aseismic to seismic transition. In these examples, Demian has brought new and quantitative thinking, experimental approaches, and careful data analysis to fundamental problems in the geosciences.

Demian’s analytical ability has not only been focused on his own contributions. He has received high praise for his work on panels of the Integrated Ocean Drilling Program. He has also been a major contributor to a series of proposals that underlie the most ambitions IODP plate boundary drilling effort yet: that to drill into an active seismogenic portion of a subduction zone.

Finally Demian’s clarity of thought also resonates through his teaching, where he is inspiring many students both at the undergraduate and graduate level.

Demian’s colleagues, teachers, and family have outlined some the reasons for Demian’s professional success:

He’s really smart, works very hard, and is consequently very productive. His strong intellect is balanced by humility, self-effacement, and the ability to have fun.

Demian listens to others, learns from others, and puts value on their contributions.

He’s dependable. When he makes a commitment, he delivers.

And finally, he rises to the occasion when given new responsibilities.

What underlies Demian’s accomplishments and personal qualities? How did he become the person he is?

Unquestionably, Demian possesses strong genetic heritage. His mother tells me that he was trying to understand how the world works from his earliest years on.

Secondly, his family obviously provided a supportive environment for his growth through constantly trying to satisfy and encourage his natural curiosity. There are stories of trips to the rock store, tackle boxes full of rocks, and lots of time spent along the seashore. In the words of this father, they also stayed out of his way and allowed his intellect to flourish.

His teachers were important and typified by Paul Karabinos at Williams College, where Demian was an undergraduate. Paul introduced Demian to the modeling of stress along the San Andreas fault and remarks that he always considered Demian as a colleague, even as an undergraduate.

Demian arrived at the University of California at Santa Cruz with a National Science Foundation graduate fellowship. He was very young and completed his Ph.D. in four years, a harbinger this award. His NSF fellowship gave him a great deal of freedom to develop his interests. In this context, I was his advisor in the truest sense, suggesting opportunities rather than narrowly directing him. Demian’s innate quantitative abilities flourished at Santa Cruz under the tutelage of Barbara Bekins, who taught him the subtleties of numerical modeling. He also gathered an appreciation for value of good data and its constraints through interacting with many outstanding graduate students and a diverse faculty.

As a National Research Council Postdoctoral Fellow at the U.S. Geological Survey, Demian continued to work with Barbara Bekins and also Steve Hickman on geohydrogeology of the San Andreas fault. Independently, he was exposed to experimental work through collaboration with Chris Marone, an association that ultimately was a powerful draw to his present position at Penn State University.

He has had a continuing association with the Ocean Drilling Program and benefited enormously from this rich multidisciplinary environment.

And finally his partner, Melanie Forbes, is providing a supportive environment for his life and career.

In summary these circumstances have developed a person with ability, desire, good interpersonal skills, a person who is willing to work at disciplinary boundaries and is equally comfortable with theory, experiment, and data.

It is particularly pleasant to be making an award to Demian Saffer, who is on such a steep upward professional trajectory, a person who is making outstanding scientific contributions and continuously developing his intuition, creativity, and originality. I am certain that GSA’s Young Scientist Award will help spur Demian on to ever-greater accomplishments.

Response by Demian Michael Saffer

I am both thrilled and honored to be this year’s recipient of the Donath Medal. As a hydrogeologist working to make connections between physical hydrogeology and geologic, geochemical, and tectonic processes, my research has afforded the opportunity to collaborate with—and learn from—world-class petrologists, laboratory rock mechanicists, and earthquake seismologists, among others. As is the case with most scientific endeavors, I share the small measure of success I have had with a number of colleagues, mentors, family members, and friends.

First, I’d like to thank my parents, Jeff and Susie Saffer, for both sparking and nurturing a broad interest in scientific discovery. Immersion in “hands-on” science often took unusual form, including “dissection day” when my older sister was ten and I was eight. This was my Dad’s idea of an educational weekend activity involving scalpels, cow’s hearts, and the picnic table on the deck behind our house. I also thank my parents for their continued support and patience, even as I took apart most of our small appliances (but did not put them back together, naturally), and as I invariably used my entire weekly allowance – or at least that portion of it not docked for dismantling appliances – to keep a local store named “Stones and Stuff” in business.

As both an undergraduate and graduate student, I was fortunate to find myself in academic departments with vibrant synergy between faculty and students. I am particularly grateful to my research mentors, Paul Karabinos at Williams College and Casey Moore at U.C. Santa Cruz, not only for their technical guidance on the tectonic and structural geology aspects of my research, but for treating me as a collaborator first and as a student second. Both also provided me with extraordinary perspective and helpful advice. The combination of independence and respect given to their students by Paul and Casey kindles creativity and a passion for research, and is a philosophy that I strive to incorporate in my roles as a teacher and a research advisor.

I also owe thanks to Barbara Bekins. Throughout the past nine years, she has been instrumental in my development as a hydrogeologist. In addition to formal training in computational hydrogeology, I have learned to be a conscientious and careful modeler by following her example. Perhaps most importantly, Barbara has taught me how to distill complicated coupled problems involving fluid flow and deformation to simple, geologically relevant, and tractable ones that are constrained by observation.

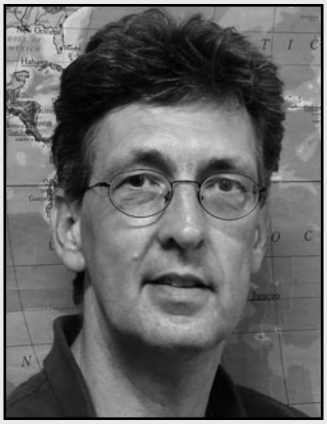
As a young faculty member, I have had the pleasure of working with many broadly interested and energetic colleagues whom I also consider as friends. Over lunch discussions, seminars, and the occasional beer, Peter Flemings, Chris Marone, Paul Heller, Mike Cheadle, and Steve Holbrook have pushed me to reach for a more complete understanding of intertwined hydrologic and mechanical phenomena, and have opened my eyes to new research directions. On a personal level, they have welcomed me to new places, and shown me by example how to be a model colleague. As comrades on research projects and as fellow shipboard scientists on cruises, Mike Underwood and Harold Tobin have both been informal mentors to me. I have also been lucky to have talented and driven graduate students so early in my career. In all, I couldn’t ask for better colleagues to learn alongside.

My wife Melanie has been incredibly patient and supportive of me, and for this I am perhaps most thankful. I am truly privileged to have a partner who understands and shares an interest in my work, but at the same time has shown me the immeasurable value of keeping my work life in perspective.

Finally, I would like to thank Dr. and Mrs. Donath and GSA for establishing this award to recognize and encourage young scientists. Accepting this award will fuel an appetite for new challenges as I look toward the future, and as I endeavor to provide the same inspiration and opportunities for others that I have been fortunate enough to receive. Thank you again for this wonderful honor.

GSA DISTINGUISHED SERVICE AWARD

Presented to Ben A. van der Pluijm



Ben A. van der Pluijm
University of Michigan

Citation by David E. Fastovsky

It is relatively easy to accumulate a distinguished dossier of service to a Society; it is a more noteworthy accomplishment to make contributions that truly change the way the Society and its membership do business. Ben van der Pluijm has the dossier but more significantly, Ben changed the way that the Society and its membership do business.

Briefly reviewing that dossier, Ben was on the Editorial Board of *Geology* (1991–1993); he served on the Committee on Research Grants (1992–1994); he served on the Committee on External Awards (1995); he co-convened a Penrose Conference (1997); and as co-editor of *Geology* (1999–2004), he also served on the Publications Committee.

Ben brought unshakeable integrity coupled with a fierce independence to the *Geology* editorship. His explicit goal was to see papers in *Geology* accorded the prestige of publications in *Science* or *Nature*. Increases in submissions brought aggressive pressure from many quarters to increase acceptance rates. Though pejoratively dubbed a "cowboy" at the time, ultimately Ben's vision of a highly prestigious, selective journal carried the day. Submission, citation, and subscription rates continue to climb at *Geology*, affirming Ben's fundamental insights.

Geology is now a different journal from the one that Ben first inherited. Ben saw it through the growing pains of electronic submission, Ben moved the Forum online (anticipating the trend toward electronic publishing), and Ben's vision ensured that *Geology* is now the premier geosciences journal in the world. For these signal contributions, he deserves the 2005 Distinguished Service Award.

Response by Ben A. van der Pluijm

Thank you Dave for these kind words, sorry you cannot be here, and Rob for reading them, and thank you GSA for this recognition. After several thousand manuscripts, untold emails, many GSA committee meetings, outrageous anecdotes and the occasional *Geology* cover indulgence (slide: Feb 2003 "white issue"), limiting these comments to a few words is difficult. But, as I wrote so many times myself, it'll have to meet our firm page constraint. Only a few items will therefore be highlighted.

Working with GSA Publications, we ushered the publications process into the electronic era. *Geology* went cold turkey in 2001, so was among the first to reap the benefits of the Internet. Without snail mail we cut 2 months of the editorial cycle and gained much greater access to overseas scientists, leading to a truly international journal that, today, rapidly delivers exciting papers to a global readership. Combined with *Geology* growing prestige (slide: Jon Stewart with *Geology*), the electronic system also led to an increase in submissions from ~650 to ~1000 per year, which, in turn, led to the addition of a 3rd editor and a new internal management system.

Any regrets? I am already missing the copious free drinks from colleagues during my *Geology* days. More truthfully, I wish I could remember many more of the papers I handled. I also wish that I could have published some of the insightful reviews we received. The peer review system may have weaknesses, but it easily beats the alternatives, regardless whether reviewers are identified or anonymous.

In closing, I want to thank my fellow editors, Lee Kump and Hugh Jenkyns, and especially Dave Fastovsky, the entire GSA publications staff, particularly Anika Burkard and Jon Olsen, and many entertaining colleagues who must remain anonymous. A special thanks to my *Geology* assistant Carol Traynor who kept me afloat for > 5 years with her dedication, care and humor. I look forward continuing my involvement with GSA, and hopefully seeing more of my papers accepted in its wonderful publications.

Thank you.

GSA PUBLIC SERVICE AWARD

Presented to J. David R. Applegate

J. David R. Applegate
U.S. Geological Survey, Reston, Virginia

Citation by Peter F. Folger

Public service in the geosciences is difficult to define in a manner satisfactory to all who understand its value and who wish to honor those in our community who deserve distinction. The GSA Public Service Award admirably captures important aspects: improving public understanding of earth sciences or serving decision makers in the application of earth science information to public policy. Yet even that description falls short when applied to this year's recipient, David Applegate.

A Supreme Court justice once said, on the topic of public indecency, that it is difficult to define pornography, but you knew it when you saw it. Similarly, we struggle to define the nature and value of public service in the geosciences, and what defines true excellence in that endeavor. But we know it when we see it embodied in David Applegate.

What are the data that support this observation? They are numerous. Dave led the Government Affairs Program at the American Geological Institute for 8 years and elevated it to a new level of excellence, capturing the John Wesley Powell Award from the USGS in 2003. Dave did all of the government affairs for most of AGI's 42 member societies, and he added immense value to other member societies with their own programs. Dave served double duty as editor for *Geotimes* for 4 years and penned 75 "Political Scene" columns for the magazine. His columns were a joy to read, timely and relevant, and as a collection would comprise an eminently readable cross-section of those issues spanning public policy and the geosciences over nearly a decade. Perhaps Geotimes will take the hint.

Dave's "Political Scene" columns were a sampling of a prodigious outflow of analysis and commentary on topics ranging from the intricacies of the federal budget process to the geological and political complexities of nuclear waste storage at Yucca Mountain. His writings informed, as you might expect, readers of geoscience publications like *GSA Today, Eos, AAPG Explorer*, and *Seismological Research Letters*, but he also wrote for the *Ecological Society of America NewSource*, the *Natural Hazards Observer*, and the *Skeptical Inquirer*. And Dave took on issues such as creationism when the "debate" stretched uncomfortably beyond boundaries of reasonableness most scientists take for granted. On this particularly vexing and persistent topic, it takes special talent to keep one's wits about one when the other side doesn't follow the norms of scientific debate. The geoscience community has been extremely fortunate to have Dave Applegate arguing on the side of good science eloquently and forcefully for many years.

It also takes special talent to move easily between the worlds of geoscience and public policy and to make an impact in both as Dave has. He can and does testify in front of congressional committees during the day and teach courses on environmental geology and natural hazards at Johns Hopkins University at night. He can and does get his haircut at the U.S. Senate barbershop, rubbing elbows with our senior politicians, and he also rubs elbows with greenhorn undergraduate geologists on the outcrop while teaching field camp at the University of Utah. He is currently the senior science advisor for earthquake and geologic hazards at the USGS, leading the survey's earthquake hazards, global seismographic network and geomagnetism programs, and yet continues to be a source of wisdom and insight to the community at large on other issues that link the geosciences to public policy.

These are a sampling of Dave's contributions that have advanced the Earth sciences in the public interest. There is an entire other class of activities where Dave has excelled, but which do not appear on his CV or list of accomplishments. People in positions of influence and political power occasionally do stupid things, and a timely phone call to a congressional office or a prudent visit to a senate staff member can often steer a decision-maker back towards a sensible course of action. Having access and influence in the political world is hard won but easily lost, and it is accomplished by earning the trust and respect of lawmakers and their staffs over the years. Dave has the ability to speak truth to power, and to be heard when it counts.

GSA has made an inspired choice in selecting David Applegate as this year's recipient of its Public Service Award. Happily for the entire earth sciences community, we honor Dave near to the beginning of his career and can look forward to his future accomplishments in advancing the geosciences to the benefit of us all.

Response by J. David R. Applegate

Thank you for this recognition! Knowing who the previous recipients are makes this all the more meaningful. I am of the generation that came to geology through the words of John McPhee, developing a view of the science so hopelessly romantic that four summers of field work in Death Valley could barely put a dent in it. I am fortunate to have worked alongside Julie Jackson at the American Geological Institute, watching Earth Science Week blossom under her care, and I am in awe of Stephen Jay Gould and Eugenie Scott, powerful voices on behalf of the teaching of evolution. Personal heroes all.

It is an honor to be introduced by my distinguished colleague from the American Geophysical Union. In Washington, people refer to their distinguished colleagues all the time, but they seldom mean it. I do. For the better part of a decade, I have had the good fortune to make common cause with Pete, his enthusiasm and commitment carrying us through many a geopolitical scrape.

Without money to put in campaign coffers or voter blocs to sway, geoscience societies have but one case to make for policy action: public value. Fortunately, we have a strong case to make, because geoscientists have a great deal of relevant expertise and perspective to contribute to important policy debates. I owe my career as a science policy wonk to the commitment made by geoscience societies to actively engage in this arena. An AGU congressional science fellowship brought me to Washington in 1994, where I experienced the inner workings of a Senate committee during a year of political sea change that brought with it the threatened elimination of the U.S. Geological Survey. That experience showed me the importance of building broad coalitions of support and the willingness of the geoscience community to mobilize for a cause.

I applaud GSA for its support of congressional fellowships—our most direct means of injecting geoscience expertise into the policymaking process—and express my gratitude for the contributions that GSA made to the AGI Government Affairs Program during my eight years there. Support from GSA and other member societies enabled the program to grow toward a goal that Sam Adams set for me when I first arrived at AGI: That there not be a single major issue facing the geoscience community in Washington to which the program did not respond. I am indebted to Sam not only for handing me such an elegantly simple, albeit daunting, challenge, but also for his encouragement and guidance throughout my time at AGI and especially during our collaboration on *Geotimes*. His is a steady compass.

I am also indebted to AGI's Executive Director, Marcus Milling, for giving me enough rope with which to hang myself, trusting my judgment and providing the resources needed to get the job done. I also want to express gratitude to Jon Price and Murray Hitzman, early guides in D.C. who have remained long-time mentors and friends, and to Kasey White, Margaret Baker, Emily Wallace, and the many geoscience student interns who rose to the challenges that a small program provides. Moving beyond work, my thanks to David Dinter and the University of Utah for allowing me to still be a field geologist on occasion. And to Heidi for showing me just how glorious life can be.

During my decade in Washington, I have known many public servants, but I did not fully apprehend the meaning of public service until I joined the USGS last year. From the inside, I see just how hard the Survey's extraordinary scientists are working to understand geologic hazards and to build partnerships that translate understanding into better building codes and faster delivery of hazard information, getting it into the hands of the people who need it when they need it and in a form they can use.

The devastation in Sumatra changed our world, and we have a moral responsibility to avoid a similar catastrophe whether in that region, the Caribbean, or around the Pacific Rim. Recognizing that scientific knowledge and warning systems must be paired with public education, let us all take a lesson from Caltech's Kerry Sieh, whose posters for Sumatran coastal communities conveyed what he had learned about past tsunamis and what to do about the threat from future ones. The work of every geoscientist in this room has implications for society. We have an obligation to explain those implications and by doing so, make a difference in a town, a school system, a legislature, or along a coast half a world away.

Thank you very much.