

## 2017 Alexander von Humboldt Medal F. Stuart Chapin III

*By Robert K. Peet*

The Alexander von Humboldt Medal for Excellence in Vegetation Science is the highest award that IAVS can bestow on a scientist. Established in 2011, it is awarded at approximately two-year intervals in recognition of an outstanding body of work that has strongly impacted vegetation science. It is my honor and privilege to introduce the 2017 recipient of the IAVS Alexander von Humboldt Medal, F. Stuart Chapin III.



Terry, as we all know him, is Professor Emeritus of Ecology in the Institute for Arctic Biology at the University of Alaska. He has received far more awards and honors than I have time to report. As examples, he received the 1996 Kempe Award for Distinguished Ecologists, the 2000 Usibelli Award for top researcher in all fields at the University of Alaska, he was elected a fellow of the American Association for the Advancement of Science in 2000, a member of the Royal Swedish Academy in 2000, a fellow of American Academy of Arts and Science and in 2004 he became the first resident of Alaska to be elected a Member of the US National Academy of Sciences.

Terry began his undergraduate studies as an economics major at Swarthmore College. However, an inspiring introductory biology course, and many hours spent outdoors while growing up, resulted in him switching to a major in Biology. After graduating in 1966, and following by a 2-year stint in the Peace Corps in Bogota Colombia, he entered graduate school at Stanford University to work with Hal Mooney, with whom he obtained his PhD in 1973.

Terry has had a profound impact on ecology. Consider his citation statistics as reported by Google Scholar. He is one of only a very few ecologists I know to have an H-Index of greater than 120, and he has fifteen publications with over 1000 citations. An even more amazing thing is that he has had a profound impact on many different areas of inquiry. I have met superstars from time to time, but I don't think I have ever met anyone else who is a superstar in so many fields.

The first area of ecology where Terry's work has been transformative is plant physiological ecology. For his dissertation, he focused on plant nutritional adaptations to low temperature. He found that plants cope with environmental variation by changing their physiological activity,

and that plants from more variable environments are better able to adjust. I remember early in my career reading his 1980 *Annual Review* on the mineral nutrition of wild plants and thinking how this provided a compelling explanation of the mechanisms behind the types of plant strategies Phil Grime had recently proposed. Of course, Terry has continued to provide critical insights in many aspects of plant physiological ecology and is, along with Hans Lambers and Thijs Pons, author of the leading textbook in plant physiological ecology.

A second area where Terry has led transformative research is in the dynamics and function of the ecosystems, especially those of boreal and arctic regions. There have been many facets to this research program. Particularly important was the NSF-sponsored Long-Term Ecological Research program he developed, and the projects of the many productive scientists associated with that initiative. Among the many aspects of this project and his other work on these northern ecosystems were studies of biogeography, the importance of microbial processes, primary succession (including rethinking the classic Glacier Bay case study), secondary succession, and the changing role of fire in the Alaskan landscape. One of my favorite topics in his work is how the loss of large herbivores at the end of the Pleistocene dramatically altered the northern lands from what was a grass-dominated steppe biome to a moss-dominated tundra biome. I am sure our IAVS members will appreciate that Terry's work was not limited by national boundaries; international collaboration was frequent, especially with workers in Siberia. Terry would be the first to point out that this international collaboration was made possible by the collaboration of Terry's wife Mimi, who served as a translator. All this has, of course, led to significant discussion of the past and future changes in the boreal forest and arctic. In short, Terry has transformed boreal and arctic ecology by providing a much deeper integration and understanding of ecosystem processes with the changes taking place on these landscapes. Terry capped his work on ecosystem function by writing with Pam Matson and Peter Vitousek what is now the lead textbook in terrestrial ecosystem ecology.

A third area where Terry's work has been transformative is in applying ecological principles to earth stewardship, both in Alaska and globally. Perhaps this reflects something of his lineage and the values passed on to him. He is the third of a series of very important academics with the name F. Stuart Chapin. He grew up in Chapel Hill, NC, where his father, F. Stuart Chapin Jr., was one of the first and certainly the most central faculty member in the University of North Carolina's Department of City and Regional Planning. His grandfather, F. Stuart Chapin Sr., was a famous quantitative sociologist who taught at the University of Minnesota. Terry has contributed to many international commissions focused on the environment and climate, including the Millennium Ecosystem Assessment and Intergovernmental Panel on Climate Change. When serving as President of the Ecological Society of America during 2011 and 2012, he made Earth Stewardship a central theme of the Society and its annual meeting. As with his other transformative areas, he proceeded to create the definitive books on the topic, *Principles of Ecosystem Stewardship* and *Earth Stewardship*.

Clearly, Terry has accomplished an enormous amount during his career. But still, you might wonder, what is he really like? I asked a few colleagues who know him well. Colleagues were

unanimous in reporting Terry's ability to synthesize, to sit in a room and capture what everyone says, yet at the same time maintain his ability to be constantly positive and to be the nicest guy you could imagine working with. I will pass on excerpts from what three close colleagues wrote me.

Peter Vitousek: "To me, the most remarkable thing about Terry as a scientist is his absolute fearlessness. He is understated, and it would be easy to miss his ferocious drive to understand and to systematize understanding - but he will take on any question, and will put forward his understanding of that question publicly, in an iterative way until he is comfortable with it. All of us are informed by the process; for me, Terry, more than anyone I know, provides the moments of understanding in which I say to myself - 'that's so simple that it has to be true'."

Gus Shaver. "Terry and I spent a lot of time working together in the 1970s and early 1980s, and of course there are lots of anecdotes... What I happen to be thinking about lately are the times he entertained us by playing his fiddle---often this meant him sitting in the back seat of our van, playing wildly as we bounced our way up and down the Dalton Highway in search of *Eriophorum* tussocks to pluck. For a while I remember his favorite song was called "Whiskey Before Breakfast". All this as we drove through an ecologist's dream transect, in all kinds of weather, in the stunning landscape of the Brooks Range and North Slope. ... Those were glorious times."

Marilyn Walker. "...Terry has spent his life focusing his powerful presence in 3 main areas - his family, his fiddle, and his work. I do not think any of this was ever "hard" for him, in that he truly just followed what he wanted to do, and in being true to that created a beautiful life. The home that he and Mimi created welcomes everyone. ... It is the same understanding of "connection" that he brings to his professional work. He understands the connections in nature, and has spent his lifetime describing them, and encouraging others to do the same.

"[Here] are [two] powerful images that I have of Terry. The first was from a meeting in Iceland, in 1986. ... My friend and I went hiking on the steep and beautiful slopes above the sea. And at one point we came around a corner, and there was Terry, with his fiddle, just playing and being there in a spectacularly beautiful spot. It was almost dreamlike, with his slightly wild hair and his innocence and his fiddle, in a spot of brilliant green slopes, Icelandic sheep, and blue ocean. And he just smiled... The second image was a time I was visiting and staying in Terry and Mimi's home. ... I am a very early riser, and I was up doing something, and Terry came down the stairs. I think he was probably surprised to see someone up even before him! But with only a nod and brief greeting, he grabbed his computer and began to work. It was his writing hour. ... Terry wrote like someone devouring the most delicious meal they have ever had.... Wherever he was and whatever he was doing, he gave it his full focus. And in doing so, he has made the world a better place and produced new understanding of how the natural world works."