

Looking forward through the rearview mirror

Reflections on 22 years at IRIS - and what the future might hold

David Simpson
IRIS Membership Meeting
December 9, 2013

Facilitate – Collaborate – Educate

I have suggested to my wife that there should be a handbook on "The Unprepared Crises of Life" – those life events that you realize are coming, but you are somehow not really prepared for. Some of the chapters might be "Did you say pregnant?" or "Are the kids really going to be in school for the next 25 years?" or "How did Mom and Dad get so old?" Obviously, one of the chapters should be "So you have decided to retire?"

I must say that this is a "crisis" that, in a mysterious way, I find I am enjoying. It is providing an ability to look back at my life, my career and my time at IRIS through a lens with a very different focal length. While we can get hung up on the frustrations of today, this month, this year or even the details of negotiating a 5-year Cooperative Agreement with NSF, I find myself - in the long-view mode - reflecting on the amazing successes that I, you, we have accomplished with this wonderful organization called IRIS over the past 30 years. I have realized that if I can look back over 22 years at IRIS, then why not look forward at least a decade and think about what should/could be in store for IRIS in 2023.

My experience with IRIS has been like riding a series of waves, starting (before I became president) with the 1983 Rainbow Proposal and extending through five-year proposal cycles - a thrilling and continually renewed experience in which you, the Consortium, have continued to be the constant source of energy and stimulation.

I would like to review with you some of my perspective - through the "rearview mirror" - of what I think underlies the success that IRIS has had. I will end with some ideas of my sense of the opportunities that might be coming from a view out

the front windshield, but also some cautionary notes about potholes that I fear may lie ahead.

In the few minutes that we have this evening, I am not going to say much about IRIS programs and facilities. You will have time this week to engage with staff at the IRIS booth and review progress with the facilities. Our Annual Workshop in June will provide an opportunity to take a broader look at programmatic activities and plans.



All of our programs remain healthy:

- GSN has established itself as a preeminent example of global collaboration and interagency cooperation and the gold standard for open data for research and earthquake monitoring.
- PASSCAL continues to support yet another generation of exciting young research scientists in both national and international field programs. With serious funding constraints, PASSCAL is

under significant stress and some adjustments are going to be required over the next year, but I am confident that, given time for you to help us make adjustments, PASSCAL will continue to thrive.

- The IRIS Data Management System has become the go-to source for data for research seismologists worldwide and continues to improve user access, real time delivery and special products.
- USArray has just completed its amazing trek across the lower 48 with data quality and return that has been nothing but spectacular. And now they are embarking on operations that promise to have similar impact in Alaska.
- EPO is a part of IRIS from which I have derived significant personal satisfaction. I come from a family of educators and I am delighted with the way our EPO program has impacted young people, educators and in the public in so many ways.
- Our new venture into opening doors with Ocean Sciences, the OBSIP Management Office is already having impact in assisting and coordinating the facilities for ocean bottom observations and helping to make a broader community aware of how these resources can be used.

The Consortium

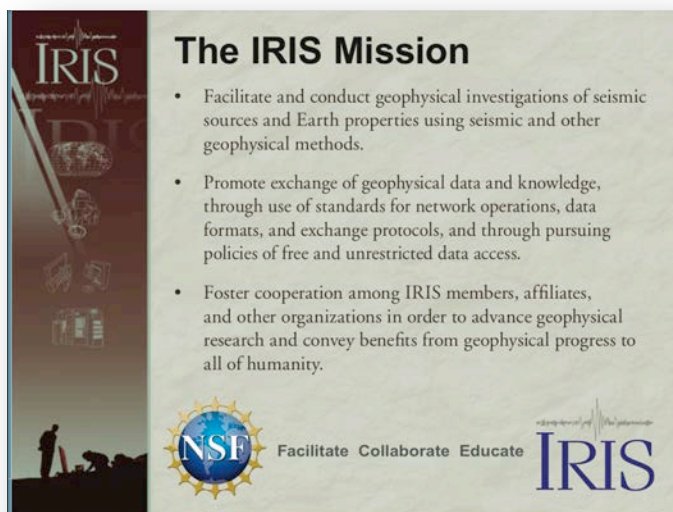
Tonight, however, is the "Annual Membership Meeting of the IRIS Consortium" and I want to put my emphasis not on IRIS the Facility - - but IRIS the Consortium.

I do this standing in front of the IRIS Mission statement - both because I deeply believe in the words of that statement - - but also because there is value in having it remain the touchstone against which we measure any activities that the Consortium undertakes.

While IRIS has developed and maintains facilities that have revolutionized our science and supported your research, IRIS has become much more. The Consortium and its activities have had fundamental impact throughout our science and community. IRIS has been the vanguard or at least an early adopter in a number of significant areas that have changed Earth Science in the last three decades:

- *Setting global standards for instrumentation, data and quality*
- *Establishing a culture of Open Data*
- *Establishing a model for community governance and leadership*

- *Encouraging interdisciplinary science*
- *Bringing the excitement of our science to students and the public*
- *Mentoring students and encouraging diversity in our own community*
- *Stimulating and sustaining interagency and international collaborations*



Many of these grow out of our facility mandate, but many of them are a much broader statement of the underlying culture of our community. It is important to remind ourselves that from the beginning - from the 1984 Rainbow Proposal and embedded in our bylaws - IRIS has been founded on a model of "Community-governed, multi-user facilities". The IRIS implementation of that model has been held up for emulation by many other disciplines in the Geosciences.

At least until now, this model has not only stood the test of time, but I am convinced that this model, - with its strong tie between the user community and facility operation, and with a continued emphasis on open access to all resources - has been the *fundamental driver* of our success.

Over the past few years, as I have learned more about the directorate structure of NSF and how the Foundation views its facilities programs, I have realized that there are many aspects of this model that are unique to the Geosciences and not understood or appreciated by many in other parts of the Foundation.



I invite each of you to reflect on:

- *How many of your colleagues in other scientific disciplines carry out their research under arrangements similar to those you enjoy in your interactions with IRIS?*
- *How many of them and their fields share the same benefits of community resources and open data?*
- *How many of them have been trusted by NSF, as a community, to govern and manage public funds to support the range of research opportunities in the same way that you have been able to do within IRIS?*
- *How many of them have equal access to data and instruments across all institutions and across all stages of their careers?*
- *How many of them have a compelling need to collaborate on gathering world-wide data and preserving times-series that extend for decades?*

While this style of science and resource sharing can be found elsewhere in the Geosciences, it is not at all common in other areas at NSF. At the upper levels of NSF and in the large facility realm, this type of collaboration is not well understood.

Scientific Culture of the Geosciences

Many aspects of this model are closely aligned to the way in which scientific exploration is increasingly carried out in the Geosciences. We are an observation-based science. Many of our successes are based on exploration of rich data sets

and not so closely aligned to the classic scientific method and hypothesis testing found in experimental projects in physics and chemistry.

There are ways in which this leads to significant discomfort and confusion at the higher levels of NSF. As EarthScope and SAGE have developed, we have found ourselves increasingly measured in the context of models for facility support that clearly have their roots in experimental physics or astronomy, and which may not be the models to best serve our science. *On the other hand*, there have been some outside of Geosciences at NSF who have been truly impressed with what we have created and sincerely interested in learning about how it works. Up to and including the level of the National Science Board, we need to respond to those who show interest and cultivate them as external advocates for our science.

Rather than retreating and bowing to pressures to re-structure ourselves in the image of classical experimental physics, or to continue to live under the impression that the Geosciences are somehow secondary or less rigorous than the classical physical sciences, we should stand up and be proud as a community of the underlying traditions of our science and join with the leadership in Earth and Geosciences at NSF to challenge the old regime and champion this cultural difference.

In an age of increasing sensor webs, big data, data mining, models and simulations, are there not good reasons why the Geosciences should be the vanguard of new approaches to transformational science and discovery at NSF? And does not the concern of the Foundation and of Congress to demonstrate societal relevance make the Geosciences even more compelling?

In a fascinating presentation to the IRIS Board this summer, Michael Wyession described to us the exciting development of "Next Generation Science Standards" now underway for national school curriculum. In that new construct, the emphasis is almost entirely on observation and exploration. The "traditional" scientific method of hypothesis testing is being replaced by one that is more strongly based on observation, models, inquiry and exploration – a natural fit for the Earth and Geosciences. If this shift is already happening at the roots of our system of science education, would it not be appropriate to encourage similar changes within NSF?

The case for strengthening the position of Geosciences within the science hierarchy at NSF can benefit from close collaborations between IRIS, our university members, our partners in NSF and peer organizations in our community to articulate both the value and style of our science

The Future of IRIS-developed Facilities

IRIS, as a facility and as a corporation, has clearly demonstrated our ability to provide to you the highest quality resources to support your research. Governance and guidance by the community has been an essential ingredient in bringing us this far.

As you approach re-competition for the SAGE facilities in 2018, I am confident that the talented staff at IRIS can, with your guidance, present compelling observational and data programs that should easily pass an appropriate and balanced technical review.

How a proposal from the Consortium will fare in review, however, depends greatly on how NSF, in its infinite wisdom, sets up the environment for review. I suggest that you, as a community, should seek to have a significant voice in how the environment for that review is structured - to ensure that the outcome is properly aligned with your continuing research needs. Without your input, I am less sanguine about the outcome.

At the USAAC meeting yesterday our Program Manager, Greg Anderson, specifically asked for this input. Engage him. He needs to clearly understand the needs of the community and the organizational structures that you see as best serving your facility needs.

I would hope that, by their very nature, these facilities will remain completely open and multi-user. Whether they will remain "Community Governed" is less clear.

Forces are at work throughout the federal government, and increasingly within NSF, that push strongly towards a management style that is much more strongly founded in "best management practices", constant external review and tied to rigorously defined metrics. These are laudable attributes in their place.

However their implementation is usually linked to rigid and hierarchical structures that distance the implementers from the user community they should

serve. I find this at odds with the underlying flexibility and spirit of exploration that NSF should be espousing as essential for transformational science. I would like to think that this culture of evolution and flexibility has been a hallmark of IRIS throughout our history and I encourage you to fight to see that it is preserved.

The Consortium at Risk?

In spite of continued erosion of funding, the management and productivity of our core facilities and USArray remain strong.

For now, the Consortium itself is also strong, engaged and effective. However, I am concerned that there are aspects of the Consortium's support that are vulnerable and, without your engagement and some systemic changes, potentially at risk.

Your Consortium activities have historically been strongly leveraged (and initially were completely supported) by funding under one award from NSF. With the increasing emphasis by the Administration and by NSF on tightly managed and closely audited facility management, this link between the facilities and community governance is threatened.

Lest I be seen as painting this with too dark a pallet, let me say that there is significant merit in much of what is being sought by our sponsors, in terms of accountability and effective management tools. It is how these tools are implemented and how we can respond to them that count. We need to track these changes and their influence on our operations closely.

Rather than railing against these changes, or simply bowing to accept them, we may be well advised to acknowledge them as part of a broader societal change and put our energy into seeking innovative ways in which we can rise above the fray and retain a proper balance between facility operations and the other activities of the Consortium.

At its core, the shift that we are experiencing is one in which NSF places more emphasis on IRIS as a facility operator and, perhaps appropriately, is less inclined to support our Consortium and community activities.

It is not, I hope, that NSF does not see the intrinsic value in the Consortium or the community activities that it supports. It is simply that these are now being evaluated by NSF in the context of how

those activities inform the operations of a set specific activities under a facility award called SAGE.

Looking Forward - the Road Ahead Dealing with Change

God grant us:

**the serenity to accept the things we cannot change
the courage to change the things we can
and
the wisdom to know the difference.**

Facilitate – Collaborate – Educate

If you, the Consortium, are content to restrict the activities of IRIS to this narrowly defined set of activities then I suggest that you plan for a future of continually diminishing resources, attrition and atrophy. NSF funding alone is not, and certainly will not, be sufficient to satisfy the continually growing aspirations of our community.

If the community values what IRIS has provided, then you, the membership, need to take possession of the Consortium and ensure its future as a secure and sustainable entity, linked to, but not completely dependent on a single NSF award.

Over the past 30 years, NSF has provided a secure, productive and healthy nest in which a highly linked facility and Consortium structure has been encouraged to grow and evolve.

Rather than seeing the changes that are now emerging as a threat, I encourage you to see them as an opportunity. I encourage you to work with your new Board, your new governance structure and your new President to renew the IRIS Consortium as a vibrant and even more exciting leader in the Earth Sciences.

Looking Forward - the Road Ahead

I have suggested that the current transitions at IRIS - new Cooperative Agreement, new Board, new President – and the changing environment at NSF - provide an appropriate opportunity for *Change*.

- You, as Consortium members, through your Board and committees, should evaluate whether you

agree that this is the case – and if so, accept the need for change and Act.

I also propose that there are reasons why our community should stimulate a re-assessment of our scientific culture and the position of the Geosciences within NSF. If you agree, it is important that you continue to:

- Demonstrate the quality, value and relevance of your science
- Work with NSF to strengthen the funding portfolio for Geoscience research

You will need to continue to work to maintain precious NSF funding for the core IRIS facilities that are closely aligned with the Foundation's mission to support fundamental research.

- *Leverage NSF funding with external support for related activities*
 - Continue to "Diversify the Portfolio"
- *Segregate - carefully - facility activities from other Consortium goals*

Looking Forward - the Road Ahead Challenges and Opportunities for the Consortium

- **Evaluate and accept the need for Change**
- **Deepen our scientific culture and its support**
 - Demonstrate the quality, value and relevance of your science
 - Work with NSF to strengthen the funding portfolio for Geoscience research
- **Sustain the facilities and program support**
 - Leverage NSF funding with external support for related activities
 - Continue to "Diversify the Portfolio"
 - Segregate - carefully - facility activities from other Consortium goals

Facilitate – Collaborate – Educate

Only with the full support and engagement of the Consortium membership can IRIS define and implement its "view forward".

- *Engage the membership*
 - Ensure open communication with the Board and new President
- *Review and re-assess the IRIS mission and goals*
 - Continue to align governance with mission
 - Align activities with funding sources

Looking Forward - the Road Ahead

Challenges and Opportunities for the Consortium

- **Reinvigorate the Consortium**
 - Engage the membership
 - Open communication with the Board and new President
 - Review and re-assess the IRIS mission and goals
 - Continue to align governance with mission
 - Align activities with funding sources
- **Strengthen the funding base for Consortium activities**
 - Independent from prescribed facility tasks under a single award*
 - Build the Consortium's unrestricted fund base to provide flexibility*
 - Private foundation and individuals
 - Industry
 - Membership - Institutional and individual

Facilitate – Collaborate – Educate

Additional financial resources, beyond those provided by NSF, will be needed for IRIS to reach the aspirations of the membership. Our unrestricted membership "endowment" fund has doubled in the past year and gone up tenfold since I arrived at IRIS. While it is prudent from a corporate sense (as we learned from the recent federal government shutdown!) to have emergency reserves to

supplement our operating budget, our unrestricted funds have now reached the level were they provide a healthy and secure base from which to embark on a new endeavor to enhance the core support for the Consortium.

- *Strengthen the funding base for Consortium activities*
 - *Independent from prescribed facility tasks under a single award*
- *Build the Consortium's unrestricted fund base to provide flexibility*
 - *Private foundation and individuals*
 - *Industry*
 - *Membership - Institutional and individual*

The Best of Times – The Worst of Times

I have always chosen to look at life through the lens of Dickens' "Column A" – and my "view through the rearview mirror" certainly places my experience at IRIS in that perspective. The current fiscal and Congressional climate may have nudged us towards "Column B", however, in the long run, I am convinced that the Consortium's strength and energy can ensure that the future for IRIS can continue to be one of "The Best of Times".

Change and Opportunity

Charles Dickens
"A Tale of Two Cities"

Column A	Column B
It was the best of times	It was the worst of times
It was the age of Wisdom	It was the age of Foolishness
It was the epoch of Belief	It was the epoch of incredulity
It was the season of Light	It was the season of Darkness
It was the spring of Hope	It was the winter of Despair
We had everything before us	We had nothing before us
We were all going direct to heaven	We were all going direct the other way.

IRIS WORKSHOP – 2006

Facilitate – Collaborate – Educate