

Interest from foreign institutions in joining IRIS as Foreign Affiliates is apparently increasing, as evidenced by the number of applications for affiliation now before the Board of Directors. This change could be ascribed to the publicity associated with EarthScope, the recent occurrence of several major disasters in which the GSN played an important part, the growth of digital networks nationally and regionally, and the growth of national seismological institutions needing support and experience as they establish their research and monitoring programs. For denumerable reasons, membership as an IRIS Foreign Affiliate is perceived to be of some benefit to these organizations and institutions. IRIS could potentially build on the opportunity presented by this increased interest by better defining the goals and benefits of the foreign affiliate program as well as metrics to judge its success. For example, free and open data exchange of seismic data sets has long been an ideal supported by IRIS. Endorsement of a policy related to free and open data exchange on the part of foreign affiliates could be of long term benefit to all IRIS members.

The goals of a Foreign Affiliate Programme, broadly cast, should be to continue to build the global infrastructure for seismology. Specifically, the programme should encourage:

1. free and open exchange of seismological data in real time, and adherence to international standards of data collection, quality control, distribution and archiving;
2. open scientific collaboration between IRIS member institutions and their international partners, leading to sustained and sustainable interest in maintaining highest-quality data collection and distribution;
3. the internationalization of seismological science and its supporting facilities in order to promote a culture that couples interest in global tectonic problems to the improvement and support of local capacity in earth monitoring for research and applications, including natural hazard reduction.

Existing IRIS policy is non-specific and not goal oriented. The IRIS bylaws state:

“Section 4: Foreign Affiliates: Institutions not chartered in the United States may be elected as nonvoting Foreign Affiliates by the affirmative vote of two-thirds of the members of the entire Board of Directors. Foreign Affiliates may appoint a nonvoting representative to attend Members’ meetings. The rights and privileges of Foreign Affiliates with respect to participation in the scientific activities of IRIS will be according to policies established by the Board of Directors.”

Thus the mechanism for achieving goals and objectives is for the Board to define and establish the “rights and privileges” of Foreign Affiliates, or at a minimum policies that establish effective guidelines for defining these on a case-by-case basis. For example, in return for rights and privileges, it should be clear that Foreign Affiliates have certain obligations (as does the normal IRIS membership) that in principle, if not in practice, support the concept of free and open data exchange, and scientific collaboration.¹

¹ It’s worth noting that regular IRIS membership does not require an explicit endorsement of the goals of standards-driven open data exchange and open scientific collaboration, except in cases where the member institution is directly involved in collecting data as part of the IRIS GSN or a PASSCAL experiment. Perhaps this should be revisited.

As a strawman, the delineation of the rights, privileges and obligations of Foreign Affiliates should be governed by:

1. the benefit to IRIS and its membership, as measured against the broader goals of the foreign affiliates program given above. Metrics should be defined;
2. the benefit to foreign affiliates, as measured by their own metrics as appropriate;
3. the potential for support (funding and nominal) by national and international agencies, within and outside the US.

The central benefit to IRIS and its membership obviously is free and open data access in real time or near real time, with adequate metadata and adherence to format and quality control standards. Once established, such access opens multiple pathways to, among other things, densification of the GSN, scientific and educational collaborations for the IRIS membership, improvements to operational capacity in Earth monitoring, baseline studies for PASSCAL experiments, and new funding opportunities. These outcomes should be viewed as reciprocal, in that foreign affiliates presumably benefit in a similar fashion. Open data exchange should continue to be the core goal of a Foreign Affiliate program.

An important consideration is that many of our potential partners are not in a position to unilaterally change their nation's policies. Nor is it a given that they would be involved in data collection or seismological operations, rather than just scientific or educational collaborations. On the other hand, we would expect that major universities and research institutions in other countries should be able to influence national outcomes in the long run. A properly structured IRIS affiliation could even enhance their influence by providing them with international stature, assets and capabilities that could not be developed without great local expense, effort and time.

This suggests that IRIS should establish affiliate classifications that signify the extent to which the affiliate is involved in data supply or has research and educational priorities. Further, IRIS should establish metrics measuring progress toward free and open data exchange, including assessments whether affiliates are contributing positively to the eventual release of data. In fact, measuring progress rather than raw bit flow opens up new flexibilities in the approach to foreign interactions that allow fine-tuning of the relationship to suit the particular situation.

Assuming that foreign affiliates having operational responsibilities agree to open data exchange in principle, in practice they could achieve a level of operational excellence built on the two decades of IRIS investments in data collection, quality control, archiving and user access. There would be no need to expend scarce resources on building national capacity from scratch, and attention could be spent on more immediate concerns such as scientific studies and earthquake hazard reduction.

Such efforts could be illustrative to national and international science and aid agencies as jump-starting technical and scientific capacity building, and promoting confidence-building measures in international scientific collaboration and technical exchange. It could also open new funding avenues for IRIS, for example, by expanding data management education programs or developing more projects like AfricaArray.

Following is a summary of potential benefits for IRIS and foreign affiliates.

Accruing to IRIS:

- Ultimate goal of free and open data exchange, including moving forward on deterministic pathways
- Long-term enhancement of opportunities for scientific collaboration
- Data will be in IRIS format. No technical barriers to data integration
- Proactive step towards fostering direct academic-academic scientific exchange that is more agile and forward thinking than current bilateral MOUs overseen by the state department and NSF/USG. Could give IRIS convening authority based on multilateral view.
- Provide stronger motivation for IRIS to more actively engage foreign affiliates with for a at annual meetings, other technical workshops, perhaps underwritten by NSF international funding

Accruing to Foreign Affiliates:

- Validation of Affiliate's scientific status within country or region;
- Benefits of joining a community that uses data standards resulting in virtually no technical barriers to data integration;
- Possible seat at the table (e.g. DMS SC) to give input as technical standards evolve;
- Although DMS software is freely available, membership would allow more interaction for installation and use (supported by DMS?);
- Access to software and systems requiring licensing (BRTT, database);
- Set-asides of summer student internships (for example) for Affiliates, with links to research and technical capacity building and hazard reduction

Proposed Policy

Since much of the benefit to the IRIS membership and to Foreign Affiliates is derived from open data exchange, this must be a central component of the foreign affiliate relationship. We should recognize that this might not be immediately achievable, but strongly encourage the notion that status as a Foreign Affiliate is a legitimate and structured approach to reducing technical barriers to eventual free and open data exchange and inclusion in global data archives and user access systems.

We propose that the BoD adopt a policy that requires Foreign Affiliates to agree that open data exchange is a goal, and that they be active participants in developing pathways to eventual data release adhering to international standards of data and metadata collection, quality control, exchange and archiving.

Thus, draft language is:

“Foreign Affiliates agree that international scientific and educational collaboration is enhanced by adherence to international standards of digital data collection and storage, and by the promotion of free and open access to seismological data and associated metadata where feasible. Affiliates agree to support, in an appropriate way, efforts to promote open data access. In cases where open data access is not now feasible, affiliates agree to support the development of nationally appropriate pathways that would lead to eventual release. In return, Affiliates will be afforded rights and obligations as specified by the IRIS Board of Directors. The IRIS BoD retains the right to review foreign affiliate status under these terms.”

In exchange, the right and privileges of Foreign Affiliates are: (tbd)

- Access to the Data Management System, including
 - Requested data segments from the Data Management Center and from affiliated data centers that participate in DMS initiatives for seamless data access;
 - Temporarily withheld experiment data where the principal investigator has authorized release to a user at the Foreign Affiliate;
 - Continuous real-time data from GSN stations (and, where appropriate, telemetered PASSCAL experiments) if the Affiliate has purchased telemetry links with the required bandwidth.
- An invitation to the IRIS Annual Workshop and to other IRIS meetings where a representative of the Affiliate could provide distinctive knowledge or expertise.
- Access to technical reports and other documents, including the IRIS Annual Report, the IRIS Newsletter, the DMS Electronic Newsletter, IRIS E&O posters and one-pagers, and reports from ad-hoc workshops sponsored by IRIS.
- Participation in technical and scientific meetings tbd
- Opportunity to submit proposals for IRIS programs that include
 - Joint P.I. status in PASSCAL experiments;
 - Long-term loans of refurbished instruments;
 - Hosting or participation in occasional training workshops on topics such as operating a GSN station and managing data from a regional seismic network.
 - Representation on FA working group, staggered representation, rotating?

Grandfathering: if the proposal is approved, draft language to send to all current affiliates asking them to accept the new protocol and outlining long term benefits and plans

Pending: the same