

RAISING THE LEVEL OF GEOSCIENCE AWARENESS THROUGH A PUBLIC LECTURE SERIES: BRINGING EARTH SCIENCES TO THE COMMUNITY

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ABSTRACT

A well-coordinated seminar series centered on popular and current topics presented by dynamic, enthusiastic speakers can provide an important programmatic highlight on campus. Over 6 years we have produced 11 lecture series with over 40 individual talks at a moderate-sized community college and small selective liberal arts college. These experiences have provided us with insight as to successful strategies for running well-attended lecture series for the entire campus. The focus of specific talks or series themes should be on topics that have broad appeal and deal with contemporary or regional issues. We include talks that link science to human culture, public policy, politics, economics, or mainstream topics or disciplines. To keep a wide audience engaged, we remind the speakers that they need to communicate their message to a general audience, and it is crucial that talks are not too technical. Positive attention from a well-run, high profile, well-attended public lecture series may bring unexpected rewards to your program.

Keywords: Lecture Series, Geology, Geoscience Awareness, Scientific Literacy, Environmental Studies

INTRODUCTION

We believe that there is a lack of geoscience awareness by the public including students and faculty on college campuses (Hazen, 1992; Patterson, 1994, National Academy Press, 1995). Although the public is locally conversant with the general aspects of earthquakes, volcanoes, and dinosaurs, average citizens know little of the geosciences and the role they play in society. Important global issues of environmental degradation, climate change, and geologic resources rarely make headlines, but these are clearly important issues to the average citizen (i.e. Schneiderman, 1995). Television programs such as NOVA and the specials on the Discovery Channel make the geosciences more accessible than ever to the public, and the popularity of such television programs demonstrates interest in science by the public. Despite this apparent accessibility and interest, the public largely lacks a general understanding of earth systems and processes (i.e. Durant *et al.*, 1989; Miller, 1991; Palmer, 1991; Stout, 1991; National Science Board, 2000).

In this paper we summarize and analyze two college lecture series that address the issue of low-level public awareness and understanding of the geosciences. These lecture series draw large numbers of members of the community onto campus and highlight issues and current topics in the geosciences. We also present what

we believe are some of the necessary ingredients to create a successful science lecture series and the benefits such a series can bring to your college, your community, and the geosciences. We write this summary having produced 11 lecture series (3 to 7 talks each) with over 40 individual talks over the last 5 years. We highlight strategies used at two different types of institutions on either side of the United States: one a community college in the resource-rich and hazard-prone Pacific Northwest, and the other a small very selective 200-year-old liberal arts college in the tectonically stable Northeast US that has a host of environmental issues inherited from a long history of industry. The Spokane Community College lecture series is largely non-thematic and focuses on geology; whereas the series at Union College often follows a thematic framework and includes geology as well as environmental studies and allied topics. Given the great differences between our schools, we suggest that other departments who stage these events will enjoy similar benefits.

We realize that many geoscience departments run regular successful colloquium series that are largely geared to the scientific community on campus, or just the geoscientists on campus. There is clearly a need for such colloquia, but here we are advocating a different approach that emphasizes the art of communicating science to the public. How unusual is our approach? Our web searches determined that the number of programs that run such "outreach" lecture series is extremely low. It would appear that the traditional formula is most widely used in geoscience departments. As such, in this paper we outline our approach and philosophy on running such a series, so that others who might be interested can benefit from our mistakes and lessons learned.

BENEFITS OF A GEOSCIENCE LECTURE SERIES

A successful lecture series takes an enormous amount of effort, but the faculty, students, campus, and community all benefit. Across campus, a lecture series could focus the attention of the campus community on specific issues. Such a series engages students and offers them an opportunity to meet with top scientists in their respected disciplines. Good speakers who can communicate the passion of science, the excitement of field-work, and the thrill of laboratory discoveries might result in increased enrollments. A high-profile series may also raise the status of a geoscience program on campus. College administrators strive for positive public attention and interaction with the community; getting the public on campus for positive events is one of the best ways to achieve this. A public lecture series may also sharpen and enhance relationships with the local businesses community. With corporate support, local industry is more apt to hire students and offer internships.

Companies want to sponsor such a series because a modest expenditure can bring improved community relations. Finally, an earth science lecture series offers a wonderful opportunity for professional stimulation. Interacting with top scientists brings significant personal professional rewards for both faculty and students. Experiencing the wide-ranging disciplines of study and research may stimulate new ways to view our research and teaching.

INGREDIENTS FOR A SUCCESSFUL SERIES

For five years we have held large campus-wide seminar series to highlight either geology or environmental studies. In putting these programs together, we independently came up with a number of guidelines that we use to assure that the series is well received by the campus and local community. Some of the points we review below seem obvious, but it is remarkable how often lectures fail to capture and hold a regular audience. Overall, it is important that the series is well organized and clearly laid out with fixed dates, times, and informative talk titles. We have found that there are several crucial factors that ultimately contribute to the success or failure of a public lecture series: (1) popular topics with broad appeal, (2) dynamic and enthusiastic speakers, (3) widespread campus and community promotion, and (4) organization. With this seemingly simple recipe, a successful well-attended geoscience presentation can be achieved. Here we briefly comment on each point.

A Series with Broad Appeal - Exciting popular topics make a program successful. Our series have had a range of topics from catastrophic geologic events such as volcanic hazards, giant earthquakes, and massive floods to the origin of life, and snowball Earth. What may be interesting to you as a geoscientist may be very dull to the public. Regardless of the speaker's charisma, a talk on a complicated highly technical subject may not hold the interest of a general audience if not presented in a simple, understandable manner. Topics of local interest can be very successful because the topic may directly touch the lives of local residents. Consider topics such as wetlands, lakes, groundwater contamination, hurricanes, flooding, seismic activity, mining, petroleum exploration, radon, to name a few (see Lindholm, 1980 for other examples).

We also try to include talks that link science to human culture, public policy, politics, economics, or other mainstream disciplines. At Union College, we found that a mix of topics under a broad theme attracts a broader audience and gives students unique perspectives on a central theme. For example, a series entitled *Water and the Law* included a talk by a lawyer featured in "A Civil Action" who presented the legal aspects behind the Woburn MA, groundwater contamination case. His talk included how he had worked with geologists, and how the geology and the science behind groundwater were relevant to the case. For a series on *Lakes and Environmental Change*, a talk focused on the Lake Champlain basin, but showed artifacts imaged by side-scan sonar. These artifacts included the missing boat of Benedict Arnold from the Revolutionary war, and the audience could clearly see the importance of the work in the context of American history. A final example is the politics revolving around the discovery of the Kennewick Man in the Pacific

Northwest. Here the audience learned about the discovery as well as the political and cultural opposition to the research. Establishing a direct link behind the science and the human culture is important because for some, this is the first time they will see a connection of their own interests to science.

Multi-component Thematic Series - Another successful strategy is to present a series of similar topics or themes, as briefly mentioned above. A series theme allows linkage of seemingly unrelated topics and ties together different ideas surrounding multifaceted problems: ideal for an environmental studies program. A well-crafted and timely theme will almost automatically promote itself to the media. A series with an informal "mission statement" is easier to promote to the media and easier to explain to the speakers. It is good to get this mission statement to the speakers early so they have time to adjust the content and direction of their talk. The approach here is somewhat different to how series are typically arranged in geoscience departments because we first determine the program theme and then find appropriate speakers.

At Spokane Community College we used a similar approach to address water quality issues in the Coeur d'Alene watershed. For this complex topic, we put together a panel discussion of professionals, scientists and governmental agency representatives from the many interests involved. Included on the panel was a biologist representing the local Coeur d'Alene tribe. We tried to give the panel balance, so the public could get exposure to all sides of the complicated scientific and social aspects of this complicated issue.

Media Contact and Advertisement - Once the program is arranged, the success of our series depends on proper advertising, public relations, and media coverage. Direct mailing of the series contents and press releases are crucial, and it is easiest to coordinate these actions with the campus public relations office. Press releases allow the series lineup to be published in the "Community Notes" or "Public Lectures" section of local and regional newspapers. When appropriate, we submit press releases for individual talks two days before the event to facilitate media coverage. If reporters do show up, we make sure that they have time alone with the speaker. For a speaker on the geochemistry of sediments in the soon-to-be-dredged Hudson River (NY), we coordinated post-talk press releases as well as interviews with the speaker. This took considerable coordination, as three TV stations and two newspapers covered the lecture because it came on the heels of a controversial EPA decision about dredging. Posters for the series are critical especially if they can be hung for the duration of the event (a month or more).

A lead time of one month seems to be enough time to adequately promote an upcoming series. Over time we have developed mailing lists that target regional colleges and universities as well as governmental agencies, high school districts, high school science teachers, and individuals in the community. Announcements for flyers are written for the public, our principal target audience. These flyers have simple, short, and enticing abstracts. We fax announcements to the local radio and television stations as well as newspapers. Before the event, we offer interviews to the local talk radio stations if the topics are of specific global or regional interest.

Finally, we create web pages for the lecture series with the series schedule and other details.

Links to Courses - We have had better success drawing an audience from the local community and less success with our own students. Several approaches seem to draw in some of our students. One is to tie the series or individual lectures to concurrent courses. We commonly find that speakers are more than willing to talk to a class during the day. At SCC, a talk on the 1991 eruption of Mount Pinatubo was organized to coincide with a Natural Disasters course offered on campus. Prior to the evening lecture, the speaker gave an afternoon presentation directly to the class on volcanic hazards and public awareness. At Union, the series *Water and the Law* was either required or strongly recommended to students who at the time were taking a course in either *Groundwater Hydrology* or *Environmental Politics*.

Information for the Speaker - Dynamic, enthusiastic speakers are what we want to ensure that the series will succeed. We make it clear to each speaker that they need to lecture to an audience that includes non-scientists; we refer to them as the "Nova" or "National Geographic" crowd. The ability of the speakers to reach the right level is absolutely crucial to the success of a program. We remind the speakers that they need to communicate their message to an audience with no expertise or knowledge in the subject area. All too often colloquium talks in science are so technical that even the students in the discipline are quickly lost, and as a result these students stop showing up to talks. In our experience, some speakers are better than others at delivering a simple message, and for many this approach might require new slides, overheads, etc. If the speakers and topics are not consistently interesting and entertaining, we expect our numbers to drop. Naturally, it is sometimes difficult to predict how a speaker will do, but it is crucial to inform them about the nature of the series and typical audience level.

Getting Established - We started small and through time our programs grew and developed a regular "base" audience. This base audience has been a good source for series-promotion in the community. For one early series at SCC, we began the season off with a presentation on the local aquifer and some of the controversial issues regarding the future of the aquifer. Because of the significant local interest in this topic, the crowd was large and a number of people that attended continued to seek out such forums. A base audience of the general public is essential to future success, and initial high-profile geologic topics, if well promoted, consistently bring the public back to campus.

Honorarium, Funding, and Audience Discussion - It is important to provide an opportunity for the audience to meet the speaker and a reception following the talk seems to work best. Many in the audience have comments that they are not willing to ask during a question period following the talk, and many just want to share experiences. After a talk by a noted paleontologist at SCC, a number of young children used the post-talk gathering to collect autographs. As a rule, we provide the speaker with an honorarium and cover all expenses, which obviously vary from speaker to speaker.

Funding for these series can be obtained through departmental funds or financial sponsorship from local industry. Expenses for a speaker series include transportation and lodging, expenses, an honorarium, pre- or post-lecture dinner with fellow faculty, announcement flyers, and mailing costs. A series of four to six lectures per year can be done on a budget of \$2000 to \$4000 (US). At SCC, the idea is pitched to local mining exploration companies as well as geo-environmental engineering firms. These companies want a return on their investment, so it is made clear to them that we promote the company on the lecture programs and at the evening introductions. At SCC, a "sponsor's board" is posted at the entrance to the auditorium, and the support is acknowledged at the start of each talk. Sponsor names are also posted on the series web page. In the Spokane area, many companies seem more than willing to contribute \$200 to \$500 per year.

TWO MODELS OF SUCCESS

The "Geology Lecture Series" at Spokane Community College. Spokane Community College, established in 1963, is located in Spokane, Washington, and is one of five regional colleges in the eastern Washington area. Spokane is a moderately sized city with a population of approximately 275,000, and the 12 month student population at SCC is c. 12,400. The Geology Lecture Series at SCC started in February of 1996 and has offered on average, four talks per year since its inception. Each lecture is free and open to the public and campus community.

The purpose for creating the series at SCC was to focus campus attention on the geological sciences, a discipline that had been underrepresented with respect to the campus liberal arts curriculum. The lecture series was conceived as a tool for drawing the attention of students, counselors, and the administration to the importance of the geological sciences. To develop a viable funding base, a regional manager of a large exploration company was approached with the idea of a sponsorship of a geology lecture series. We soon had seven local companies who had agreed to contribute a combined total of \$2,000.00. Since the initiation of this series, most of the funding has come from private sponsorship along with support from the SCC Student Activities Council.

Our first year focused on disaster-related topics: great earthquakes in the Pacific Northwest; volcanic hazards of the Cascades, the Missoula floods, and mass extinctions. The first presentation on earthquakes drew an audience of close to 125 people, and by the final talk in the series we had an audience of ~200. Several years later, the Geology Lecture Series averaged approximately 300 people per lecture with about 50% of the audience from the community (see Table 1). Over the last five years the series has focused on a diverse range of earth science topics and has not been thematic. In general we have found that a non-thematic approach has worked exceptionally well for our college. In part, we subscribe the success to the diverse population and its interests throughout the Spokane area. Since inception we have seen a significant drop in mining-related sponsors and an increase in geo-environmental sponsors.

In summary, the Spokane Community College Geology Lecture series has continued to grow in popularity with both the general public and college students because we have offered a diverse array of

| | 1995-96 | 1996-97 | 1997-98 | 1998-99 | 1999-00 | 2000-2001 |
|-----------------------------|---------|---------|---------|---------|---------|-----------|
| number of talks | 4 | 4 | 5 | 5 | 4 | 4 |
| average attendance per talk | 175-200 | 225 | 250 | 250-300 | 250-300 | 300 |
| % general public | 35-40 | 40-45 | 45-50 | 45-55 | 50-55 | 50-55 |
| % students | 45-50 | 35-45 | 35-45 | 35-45 | 35-45 | 40-45 |
| % faculty/staff | 5-10 | 10-15 | 10-15 | 10-15 | 10-15 | 5-10 |
| sponsors | 7 | 9 | 8 | 11 | 10 | 9 |
| program budget | \$2250 | \$2300 | \$2750 | \$3100 | \$2600 | \$2050 |

Table 1. Summary of the Geology Lecture Series, Spokane Community College

- 1) KILLER LAKES OF CAMEROON, WEST AFRICA - Dr. C. Stager
- 2) BACTERIAL ECOLOGY: FROM OCEANIC DEPTHS TO BALLSTON LAKE - Dr. P. Tobiessen
- 3) THE EVOLUTION AND SEDIMENTARY RECORD OF LAKE CHAMPLAIN, VERMONT - Dr. P. Manley
- 4) RECORDS OF CLIMATIC CHANGE FROM LAKES IN THE CARIBBEAN REGION AND IMPLICATIONS FOR HUMAN CULTURE - Dr. J. Curtis
- 5) PALEOCLIMATOLOGY OF THE TROPICAL ANDES: THE RECORD FROM LAKE TITICACA (PERU/BOLIVIA) - Dr. G. O. Seltzer
- 6) MERCURY CYCLING IN LAKES - Dr. E. A. Henry
- 7) SEDIMENT RECORD OF BALLSTON LAKE AS AN ARCHIVE OF WATER QUALITY - Dr. P. T. Gremillion

Table 2. A example of Thematic Series: “Lakes and Environmental Change” at Union College.

exciting and relevant geoscience topics. We have maintained a healthy sponsorship-funded budget and continue to actively promote the series through a wide variety of media, thus maintaining our dedicated base audience as well as continuing to reach out to the Spokane community.

The “Winter Seminar Series” at Union College. Union College is a small private liberal arts college in Schenectady (NY), which has a population of c. 62,000 and a campus community of 2,100 students. Union College was founded in 1795 and has since established strength in science and engineering. In collaboration with the Geology Department at Union College, the Environmental Studies Program has launched five Winter Seminar Series in the past five years. These have been hosted in the evenings, generally on a set day of the

week. The centerpiece of the campus is the 140-yr-old Nott Memorial, a recently restored sixteen-sided stone building. We hold the seminar series in this building, which is not only a historical landmark, but is a well-know icon in the Capital district. This choice of venue helps raise the profile of the series, but creates some scheduling and security issues. Funding for the series has been derived from the ES operating budget, with occasional help from the administration for honoraria associated with high-profile speakers. These thematic series have included the following topics: [A] Global Climate Change. This first series included a number of Union faculty speakers who discussed the biology, geology, physics, economics and politics of global climate change. We chose this topic in the winter of 1997 because the Kyoto Protocol was fresh in people’s minds, and it was an El Niño year. The total attendance at this series was only about 160 people. [B] Water and the Law. This series included three lectures aimed at exploring subsurface and surface water law and water rights. Speakers covered not only law, but also the science of groundwater, contamination, and land use practices. The lead off for this series was the lawyer behind the then-released “A Civil Action” who spoke to a capacity crowd. The total attendance at this series was approximately 700. [C] Lakes and Environmental Change. This series included seven speakers who covered topics such as the collapse of the Mayan civilization, the discovery of a sunken gunboat in Lake Champlain, and chemical stratification in Lake Nyos in Africa. As lakes are important for recreation in Upstate NY, this series had obvious regional appeal (see Table 2). The total attendance at this series was approximately 450. [D] The Adirondacks. This series featured five programs with a focus on the politics, geology, natural setting, and arts of the Adirondack Mountains. The total attendance at this series was approximately 650. This series was produced in collaboration with the non-profit Association for the Protection of the Adirondacks. [E] The Hudson River. This series featured six evening programs on the natural history, science, and culture surrounding the Hudson. The series coincided with intense controversy associated with proposed dredging

of the General Electric-derived PCB's in the upper Hudson. Because the series coincided with the "public comment period" of the EPA's initial report, the debate was particularly engaged during the series, and we had excellent media attention as a result. The total attendance at this series was approximately 1000. Like the previous series, this was produced as a partnership with the Association for the Protection of the Adirondacks.

ASSESSMENT

A successful lecture series should bring stimulating, thought-provoking ideas to campus, and it should attempt to engage a wide audience. One fundamental measure that we use to judge success is attendance numbers and how those numbers change with time (see Table 1). Audience numbers give us a feel for how stimulating and accessible the talks are. However, if the total number of people per presentation is consistently low, then the situation must be reevaluated. The demographics of the audience are also an important facet of the program and we note the percentage of: (a) students from around campus, (b) students in classes requiring the talk, (c) general community members, and (d) faculty and staff. Although high audience numbers are indeed a rewarding outcome, they are not the sole indicator of the series success. The fact that we continue to attract enthusiastic corporate sponsors for the SCC series indicates sustained interest.

CONCLUSIONS

We have outlined the collective attributes of our successful lecture series that grew over five years quite independently of one another. We found that it is important to run a well-organized series that is clearly laid out with well-articulated topics. We ensure that the series has broad appeal across campus and within the community. To maximize exposure we contact media, write press releases, and advertise widely. Speakers need to be aware of the nature of the program, so we take time and explain the composition and expectations of the audience. Multi-component thematic series are interesting to put together and allow a detailed examination of various angles on one subject. To increase student and faculty involvement, link the series or specific talks to concurrent courses.

Rewards may be significant for running a successful campus-wide lecture series. While these series take a considerable amount of effort, they tend to be stimulating and personally satisfying. If the press or local businesses are involved, there is little question that a successful series will attract attention to your program on campus. At SCC, the geosciences have moved up the ladder in terms of enrollments, and resources. Much of this recent success can be attributed to the wide positive exposure the program has received from the lecture series. At Union, the seminar series has been successful in engaging the entire campus and it has been regarded as a campus model for how series should function. The Environmental Studies program has received wide support as a result of this exposure. In the end, we hope that the audience members from the community have become more scientifically literate. A high-profile successful series with well-known speakers and large audience participation will undoubtedly catch the eye of administrators who may be asking where new resources should be allocated.

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