METEORITES ON THE ROAD: TAKING METEORITE SCIENCE TO RURAL COMMUNITIES. M. L. Hutson[1], R. N. Pugh[1] and A. M. Ruzicka[1], [1]Cascadia Meteorite Laboratory, Department of Geology, Portland State University, 17 Cramer Hall, 1721 SW Broadway, Portland OR 97207 (mhutson@pdx.edu; ruzickaa@pdx.edu).

Introduction: In 2007, the Cascadia Meteorite Laboratory (CML) received NASA E/PO funding for a three year project that consisted of a traveling road show involving a combination of a hands-on display of meteorite samples and lectures at schools, libraries, and community centers in rural communities focused on eastern Oregon. Here we report on the results of this project.

Discussion: Residents in eastern Oregon have some of the lowest per capita income in the United States and some of the highest unemployment levels in Oregon. The region is characterized by extreme distances to educational opportunities, making access to scientific lectures very limited. Dick Pugh, a staff member of Portland State University's Cascadia Meteorite Laboratory (CML), is a retired high school science teacher and meteoriticist. For this project, he traveled across Oregon and into southern Washington on multi-day tours with a "teaching collection" of meteorite samples, lecturing at schools during the day and at libraries or other community centers mainly during the evening. To help facilitate scheduling, CML partnered with Libraries of Eastern Oregon (LEO). Attendance at the road show lectures/demonstrations ranged from 4 to 400 people, with an average size of ~62. As an evaluator from the Silver Lake Library wrote of the 9 attendees: "9 which is a lot for this town". We have been told that people have driven 60 or 70 miles to attend one of our events. Audience members ranged in age from preschool and kindergarten students to senior citizens. Most of the lectures at libraries generated media attention, including mention in the local newspapers and on local radio stations. For many of these communities, this was a very large event.

Fig. 1. Dick Pugh lecturing to an overflowing crowd at the town hall in Union OR in May 2007.

Fig 2. Scenes from Kennewick Washington in March 2008. This event drew people with a large age range, from young children to elderly members of the community. People were given a chance to pick up and handle real meteorites, and apply magnets to them. The girl in the upper right image was surprised at the weight of an iron meteorite. Presenter Dick Pugh is the man wearing the white shirt in the lower right image.

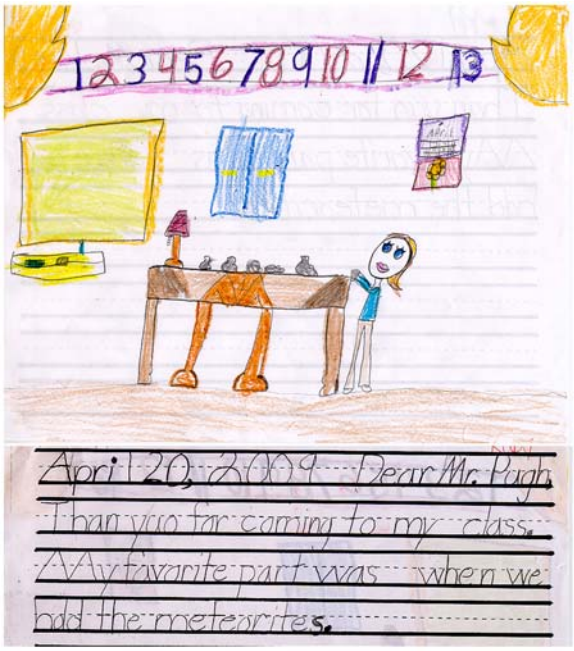

Fig 3. Drawing of meteorite display and a note from a first-grade student at Parkrose-Shaver School.

We have created several presentations for the project. The presentation given most often provides general information about meteors, meteoroids, meteorites and fireballs, with an emphasis on local meteorites and fireballs and how to identify meteorites. We tweaked this slideshow on occasion to take advantage of large fireball events that may have dropped meteorites locally, and to emphasize meteorite recovery relevant to the regions that were being visited. Additional presentations focus on a) the Willamette meteorite, using a large number of historical images, b) impacts and extinctions, and c) using rough angular measurements and counting techniques to provide a scientifically useful report of a fireball.

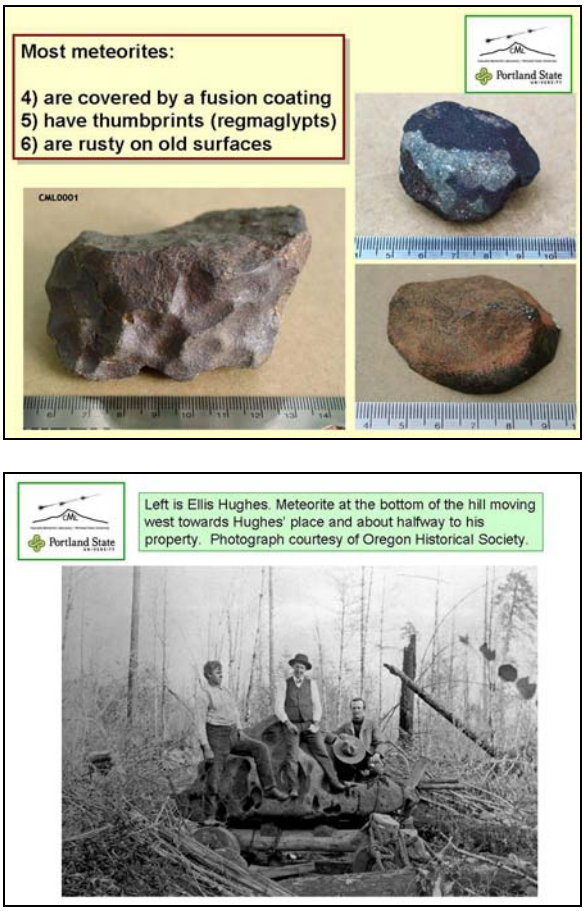

Fig 4. Top: A slide from the general presentation on meteorites, covering some of the properties common to many of them. Bottom: A slide from the Willamette presentation.

For the project we developed a questionnaire that was given to the "lead contact" (teacher or librarian) at each venue, with a stamped self-addressed envelope so as to encourage responses. Roughly half of the questionnaires were returned, representing 74 events over an approximately 3.5 year period. The survey consisted of questions about the quality of the presentation, including the most and least effective aspects, whether the event generated any local media coverage or stimulated people to bring rocks (candidate meteorites) to the event for inspection, and a question about the number of attendees. Feedback makes it clear that the lecture/demonstration was effective at creating interest in the topic of meteorites and in conveying information to the residents of these communities. Respondents often mentioned that effective features included being able to handle meteorites and the interesting stories told by Dick. A sampling of comments: 1) "Dick Pugh's slide presentation was excellent & then complemented w/the hands on meteorites following the program"; 2) "The presentation had wow factors and was kid friendly"; 3) "The kids loved handling the meteorites and asking questions. The speaker related well to 9-11 yr olds"; 4) "Mr. Pugh presented to a wide range of students (1st through 5th grade) and was able to keep all students engaged while addressing their varied questions and interests"; 5) "Great to see people from as far away as Walla Walla and LaGrande – audience was very enthused with the presentation, especially knowing that Summerville may be 'ground zero'"; 6) "Dick Pugh has a life passion—my students still talk about him one year later"; 7)"Follow-up conversations from residents indicated that this is one of the best programs ever had at Fossil."

Advertising for the events included an invitation for people to bring suspected meteorites in for examination. On average three rocks per event were brought by attendees, showing the considerable interest in having specimens identified. Roughly two dozen of these turned out to be pieces of known meteorites. However, as a result of this program, two new meteorites from Oregon (Morrow County-L6 chondrite [1] and Fitzwater Pass-IIIF iron [1]) have been discovered and classified during the previous year. Prior to 2010, there were four officially accepted meteorites from Oregon, all from the western part of the state. The two new meteorites are the first recovered from east of the Cascades. Both meteorites had been picked up by their finders decades ago. One was stored in a coffee can; the other first in a flower bed and then under a barbeque grill. Fitzwater Pass was brought in to one of our lectures. CML was contacted by the finder of Morrow County as a result of the notoriety surrounding our outreach program.

References: [1] Weisberg M. K. et al. (2010) *Meteoritics & Planet. Sci., 45*, 1530-1551