

2016 年度国際交流基金事業報告書

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2015 年 5 月 9 日から 5 月 19 日まで米国ジョージア州ケネソー州立大学助教のダン・フェレイラ博士を招聘して、土壌による陽イオン吸着現象に関する講義・セミナー及び教員・学部学生・大学院生等との研究交流を実施した。滞在中に福島県相馬郡飯舘村を訪問して、除染現場の見学や避難村民等との意見交換を行った。

2016 年 5 月 9 日 18:00–19:30 中央校舎 0302 教室

The Transport, Retention, and Remediation of Contaminants in Air, Soil, and Groundwater

(大気・土壌・水中における汚染物質の移動・吸着・浄化)

学部学生を対象にした講義 (参加者 29 名)

汚染物の定義から始まった汚染物質の挙動に関する講義は、学部 3・4 年の学生が主に聴講した。英語の講義は初めての学生がほとんどであったので、ところどころに日本語訳を入れながら講義をすすめてもらった。

2016 年 5 月 12 日 18:00–19:30 農学部 4 号館 303 教室

The Nanopore Inner-Sphere Enhancement (NISE) Effect and its Role in Sodium Retention

(イオン交換への内圏ナノ孔増強効果の影響)

大学院生、研究者を対象にした講演 (参加者 15 名)

粘土鉱物表面で起こるイオン交換機構に関する最先端の講演をしてもらった。放射性セシウムの土壌中で振る舞いを研究している大学院生やポストドクから熱心な質問がされ、教員も交えた白熱した議論が展開された。

2016 年 5 月 14 日～15 日 福島県相馬郡飯舘村訪問

計画的避難地域である飯舘村を訪問し、避難住民や NPO 法人のボランティアらと意見交換をし、除染現場や剥ぎ取り汚染土壌の仮置き場を見学した。他大学の研究者も含めて将来の共同研究の可能性について打ち合わせを行った。

これらの事業内容がアメリカ農学会・作物科学会・土壌科学会の広報誌 (CSA News) 7 月号で紹介された。

The Power of Scientific Meetings

Researchers Collaborate on Research as a Result of 2013 Annual Meeting

by Susan V. Fisk

Besides being researchers in soil science and SSSA members, Dan Ferreira and Kosuke Noborio had nothing in common—until 4 Nov. 2013. Ferreira teaches at Kennesaw State University, in Georgia, and Noborio works on the other side of the world at Meiji University in Japan.

But 4 November was the day of the symposium at the ASA, CSSA, and SSSA Annual Meeting titled “Battles of Soil Scientists in Fukushima, Japan,”¹ with Noborio presiding and Ferreira attending. From that symposium, came an in-person meeting between the two researchers at the 2014 Annual Meeting in Long Beach, discussion about potential research collaboration, and an invitation for Ferreira to visit Japan. These results show the power of scientific meetings in spurring creativity and collaboration among scientists to the benefit of society.

“After I attended the 2013 meeting in Tampa, that sparked my current research,” Ferreira says. Fukushima is an area that was contaminated by radiocesium after the Fukushima Daiichi nuclear disaster in 2011. The disaster was spurred by an earthquake and resulting tsunami; clean-up efforts are ongoing.

Remediating Radiocesium

Ferreira’s research is looking at ways to use plants (phytoremediation) to help clean up the contaminated soil.

“The way that radiocesium is incorporated inside the interlayers of 2:1 clays like vermiculite makes it

very difficult to remove using ordinary remediation methods. However, phytoremediation techniques can often succeed in removing heavy metals from soils where other techniques fail. My colleague Matt Weand, a physiological ecologist at Kansas State University, and I have identified certain plant species that we think will be effective at accessing the radiocesium inside the clay mineral interlayers.

“I invited Kosuke to meet with me at the 2014 Long Beach meeting,” Ferreira says. “We went out for lunch and began discussing my idea for remediating radiocesium in the soil downwind of the Fukushima Daiichi power plant and potentially collaborating on it in the future.”

In May of 2016, Ferreira traveled to Japan, at the invitation of Noborio, visiting research fields of Noborio’s teams. He also presented lectures at two universities—Meiji University and the University of Tokyo. Ferreira gave two lectures at Meiji University. One lecture was for undergraduates about environmental pollution and remedial technologies. The second was a higher-level talk for graduate students about his doctoral research on ion exchange mechanisms in the nanopore channels of zeolite minerals.

Helping the People of Iitate Village

Noborio is researching land in Iitate Village, 24 miles northwest of the Fukushima Daiichi Nuclear Power Plant, outside the initial radiation exclusion zone. However, wind patterns brought radioactive particles to the heavily agricultural area, resulting in the evacuation of all 6,000 residents. Limited access is now in place.

“Visiting Iitate Village in Fukushima Prefecture and discussing the research projects that Kosuke and his students are performing in the region really opened my eyes about the nature and severity of the challenges that the people in that area are facing,” Ferreira says. “Seeing the problems that the radiocesium soil contamination has caused firsthand has given me new ideas for research projects to try and help the people of Iitate Village.”

Ferreira credits the 2013 ASA, CSSA, and SSSA Annual Meeting with not only creating this new professional relationship, but also sparking ideas for future research. “It all started with that session at the meeting in Tampa.”

S. Fisk, Director of Public & Science Communications for ASA, CSSA, and SSSA



Dan Ferreira (left) presenting Kosuke Noborio with gifts from the USA (a Kennesaw State University t-shirt and Georgia peach preserves).

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¹ See <https://dl.sciencesocieties.org/publications/meetings/2013am/11722>