

photo below: used traffic vest as employed in Japan (L) and as received at WPI (R)

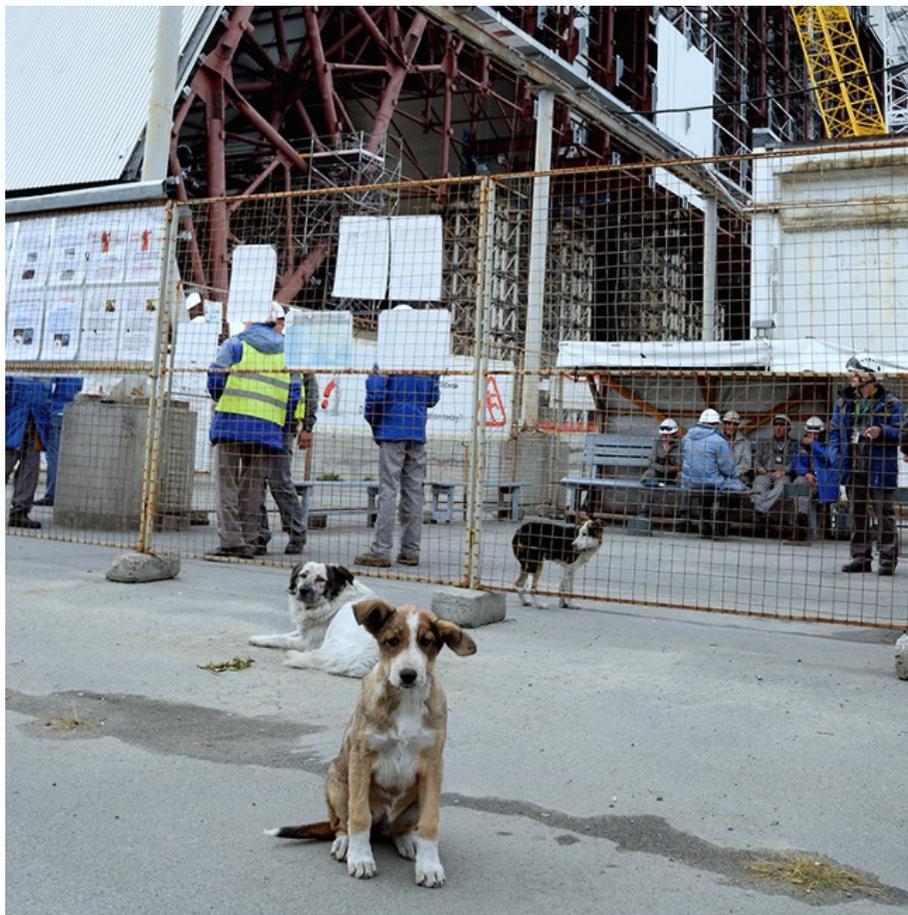


Measuring radioactive contamination in Fukushima personal protective gear

Abstract:

The soils around Fukushima Prefecture, Japan, have become contaminated with the radioactive by-products of the 2011 Fukushima Dai-ichi nuclear power station meltdowns and environmental releases. Large numbers of short-term temporary workers are used to decontaminate roadways, yards, parks and fields in northern Japan. These workers remove the top layer of soils from areas that are already re-occupied by evacuees, or may be re-occupied in the future. These are not workers from the damaged nuclear plants themselves, but people who work in surrounding communities.

This project will involve students in testing the used gear worn by these workers. Typical samples will include used faced masks, jackets, gloves, shoes, and traffic vests. Testing would include assessment of total activity and also of the activity of radioactive isotopes related to fission wastes, such as ^{134}Cs and ^{137}Cs . The project will require multiple skills including assistance communicating with volunteers in Japan, developing shipping procedures, handling samples and writing up results or a final report that will be used by the worker community in Japan. This is a long term project that can potentially extend over multiple project cycles, but is appropriate for a single one-time project as well. Community interest and support for this work in Japan is strong.



Humanitarian program and study project: Chernobyl's Dogs

Reactor unit 4 at the Chernobyl nuclear power station in Ukraine was destroyed by an explosion and fire in 1986. Since that time, a permanent work force of liquidators (clean up workers) has been stabilizing the damaged facility. The region surrounding the complex has been abandoned and taken over by forest. An exploding wolf population has driven the local feral dogs, descendants of 1986 evacuees' pets, into the Chernobyl work site itself. These dogs are not vaccinated for rabies, but they are nevertheless, often fed by plant workers, and brought inside on bitter cold days.

This project envisions collecting these dogs, then vaccinating them for rabies, followed by spaying/neutering and release. This is important for the safety of liquidators, who lack access to local human rabies vaccines if bitten. The project envisions students' testing of canine urine collected by Ukraine veterinarians, along with wipe samples of dog paw prints. These samples will arrive at WPI, where students will develop and carry out a testing program for radioactive materials related to contamination at the plant where the dogs live. It is hoped that the data provided by this study will be useful to the scientific community and to the public, and will assist in the fundraising to pay for this humane alternative to animal culling proposed by the local government. The target date for commencement of the veterinary work is summer 2017, but the program itself will run for three years; either for single or for continuing student projects. More photos are at: <http://imgur.com/gallery/574W1>