An invasion ecologist studies the ways in which species move out of their native environments and into new ones, where they sometimes have negative impacts.

Dr. Frank Koch

Invasion Ecologist

Ph.D., North Carolina State University

USDA Forest Service scientist

Dr. Frank Koch

Important Scientist Characteristics

Strong critical thinking skills are important. Mathematical skills are also helpful because the research relies so heavily on computers and mathematical models. However, creativity might be most critical — sometimes you have to be inventive to solve especially tricky research problems!

Example of a simple research question I have tried to answer:

Many people are concerned about the movement of invasive forest insects and diseases in firewood transported by campers. Can we analyze camper and firewood movement in order to predict where one of these pests might appear next, or when a pest is discovered, where it probably originated.

Technology or equipment used in research:

I study factors — such as climate or pathways of spread — that determine how, when, and where invasions happen. These factors operate at very broad geographic scales, sometimes across multiple continents. I use powerful computers with statistical and geographic information system (GIS) software to examine the relationships between these factors.

Most Exciting Discovery

I estimated the rate at which new nonnative forest insect species will become established in each major city or town in the continental United States during this decade. Not all of these species will cause major environmental problems, but now we can target our monitoring efforts more effectively.

When did you know you wanted to be a scientist?

I knew I wanted to be a scientist when I realized there were huge gaps in our knowledge about things like invasive species, and that it was possible to build a career out of trying to close those knowledge gaps.