From a social-ecological systems (SES) perspective, the Kenai River watershed is a mess.

To be more specific, it’s a “messy SES:” an area subject to interacting social and ecological changes of different types, rates and scales, from rising temperatures and fluctuating salmon numbers to increasing recreational pressure. The goal of Alaska EPSCoR’s Southcentral Test Case is to parse and quantify these changes – with a focus on hydrology and landscape change – and to better understand the ways local residents perceive and adapt to them.

“We’re interested in how different elements come together, how they interact, what’s the relative importance of different components,” explained Andy Kliskey, head of the test case. “The Kenai Peninsula provides a very interesting place to look at that because of a number of the different things that are going on.”

Salmon is the lifeblood of the Kenai watershed and a key focus of the test case, Kliskey said. “It’s very important for subsistence, for sustenance, for jobs, as an economic element in the Kenai in the communities of Soldotna and Kenai, and also for some of the social values.”

The first phase of test case research was to gather data about environmental conditions in the watershed. This meant assembling agency and sensing data to measure changes in landcover and surface moisture, installing or reactivating hydrologic sensors in three Kenai tributaries, and partnering with local entities to share data. These first steps have been followed by efforts to gather historic and current social and economic information, including a comprehensive survey mailed to households across the watershed.

“The survey was basically intended to get an idea of values and experiences on the Kenai Peninsula,” said Sarah Anderson, a test case postdoc who took a lead role in the effort. “Questions were related to perceptions of the environment, connections to the environment such as activities, what people really find important about this area, why they stay here, why they came here, how long they’ve been here.”

The next step, Kliskey said, will be to analyze and synthesize findings into useful models and other products. He said this effort will include GIS approaches to map important “hotspots” of change; systems models that link hydrologic and landscape change and decision-making; and visualization techniques through which users can watch future scenarios unfold in a virtual environment.