Tracking Sierra snow via instruments on planes

By Alexandra Witze, Air & Space

To know California' true water content in the mountains help is coming in the form of a King Air A90. Scientists have loaded the airplane with instruments to study California's snowpack in unprecedented detail.

Each spring, they fly back and forth over the mountain ranges, measuring where the snow lies and how deep it is. That information helps water managers plan for exactly how much snowmelt to expect rushing downstream each spring—and, in turn, how to divvy up those scarce gallons among the people who need it the most. The airplane can't make more snow fall from the sky, but it can help officials make smarter decisions about how to use what's already there.

The idea for the mission arose in the late 2000s, before the current drought really took hold of California. Thomas Painter, a snow hydrologist who was then at the University of Utah, attended a colleague's talk about using an airplane with a laser to measure tropical forest loss. Scientists aboard that airplane shot lasers down to the ground and measured how quickly the pulses returned, and the results made a three-dimensional picture of the landscape. Returning to the same spot time after time enabled them to study how quickly loggers were stripping trees away.

Not long after the talk, NASA's Jet Propulsion Laboratory in Pasadena, California, recruited Painter to study water resources and climate science, and he thought back to how that laser technique might be used to study snow levels. He called Frank Gehrke, chief of snow surveys for the California Department of Water Resources in Sacramento, and asked if he

wanted to know more about imaging the state’s snowpack from the air. In 2012, the Airborne Snow Observatory took off on its first mountain pass.

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