Knowing that it could take many years, and possibly decades, for the terrestrial ecosystem to recover, the agency responsible for maintaining the park needed to find a way to closely monitor the area's water cycle. They were particularly concerned about heavy rains and rising upstream water levels that could once again cause flash floods, thereby threatening lives and damaging property and park assets such as the visitor centre.

The agency turned to a local SkyWave Solution Provider with a proven history in early flood warning systems to provide an M2M (machine-to-machine) solution that could report water levels at local dams and rivers in real-time.

The Customer Situation

Between shifting weather patterns and human activity, forest fires are a frequent occurrence. Some fires have bigger impacts than others.

On June 26, 2011, a tree fell on a power line in Santa Fe National Forest, New Mexico. The sparks immediately ignited the parched vegetation and started burning the forest at a rate of one acre per second. Dubbed The Las Conchas fire, by the time it was over an estimated 156,000 acres of land had been burned, making it the largest wildfire in New Mexico at the time.

The loss of vegetation from the fire was just one of the catastrophic outcomes. With much of the vegetation removed and the ground becoming hydrophobic (or vitrified), heavy rain in the Jemez Mountains in August 2011 led to flash floods. Although newly implemented flood protection had reduced damage to the recently renovated historic visitor center, many park trails had been severely impacted.
The Solution

The agency had some particular requirements in mind. Many of the systems in the market collected data regularly but were only able to send it at specific times or intervals. This did not meet the agency’s requirement to receive level information in real-time, which is crucial since water levels can rise very quickly before a flood.

The SkyWave Solution Provider developed and deployed several water level monitoring sites. Each consisted of a stream gauge connected to an IDP-680 satellite messaging terminal and powered by a 10 watt solar panel. The solution provided many key functions and benefits for effective flood warnings.

1. **Real time data**: Data from water gauges could be received by the monitoring software within 20 seconds of being collected and sent. This was a crucial requirement during heavy rains when water levels rise rapidly and data is needed in order to quickly assess flood threat levels.

2. **Guaranteed data delivery**: The SkyWave Solution Provider implemented a handshaking protocol between the IDP-680 satellite messaging terminal and the monitoring software that guaranteed data delivery. This feature is especially important during high alert times.

3. **Use of satellite communication**: Since many of the monitoring stations are located in mountains, canyons and other remote areas, satellite messaging terminals provide a cost-effective means to install a communication link where other services are not available.

4. **Easy installation**: The solution was easy to install compared to competing solutions, thus increasing the number of areas in which it could be deployed and decreasing costs.

5. **Flexible User Notifications**: Since the receipt of water and weather data was a must for several agencies, the system was designed to inform any number of people of the critical information; data could be sent via both email and SMS text messages.

The solution’s capability was quickly tested for its effectiveness. On July 25, 2013, rains in the region led to a 17’ (5.1 meter) high wall of water barreling through a local canyon towards the visitor center. Fortunately, real-time water level information from the satellite-based solution allowed the local agency to mobilize flood protection measures in advance. The early warning ensured that no one was hurt and damage to the visitor center and surrounding areas was minimized.

About SkyWave

SkyWave Mobile Communications is a global provider of wireless satellite and satellite-cellular data communications for the Machine- to- Machine (M2M) market. SkyWave’s M2M portfolio of communication terminals and network services enable applications that provide businesses with the capability to track, monitor, and remotely manage their fixed and mobile equipment. SkyWave delivers real-time information when you need it – to and from anywhere in the world. Visit us at [www.skywave.com](http://www.skywave.com) to learn more.