

Monitoring turtle incubators in Mexico

Challenge

The Wialon partner in Mexico, CTTMX, delivered an unusual project for the government organization SEDESU (Secretaria de Desarrollo sustentable del estado de Sinaloa). This organization works to promote the sustainable development of society. One of its projects deals with helping Golfina sea turtles to reproduce successfully to ensure their survival. In doing so, the client faced specific challenges:

- **The scientists couldn't control the temperature inside incubators** while it is the most important factor affecting turtle eggs development. A certain temperature is required for the eggs to hatch. Without the real-time temperature control, embryos were dying. Besides, most turtles are subject to temperature-dependent sex determination. The temperature of the developing eggs is what decides whether a little turtle will be male or female, and scientists wanted to control this, too.

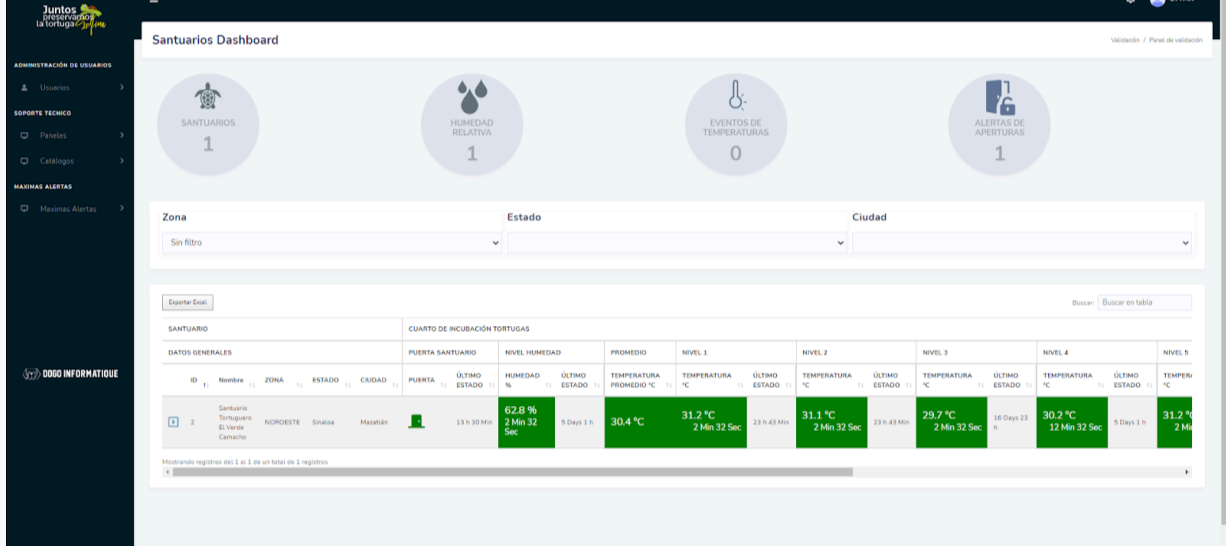


Turtle incubators

- **The scientists also couldn't control the humidity in incubators.** The right humidity is another factor ensuring the proper development of the embryos. It affects the endurance of the newborns making them have enough strength to survive in the water and fight predators.

Solution

The specialists at CTTMX offered a complex solution to address all the client's challenges. In fact, they developed an entire monitoring system that processes all the information from the sensors and other devices installed in incubators and presents it in a convenient form with the help of user-friendly dashboards. Different groups of users, from incubator inspectors to researching scientists and maintenance workers, got their own web interfaces developed by the partner.



The solution employs [flespi](#) to collect all the data on a centralized basis from several devices by different brands in the cloud and then utilize it just like the users need it. What made the solution stand out from the crowd is that it is scalable, which means it can be replicated in every incubator around the world.

Hardware

The partner used [CalAmp 2840XT](#) asset tracker, several temperature and humidity sensors by [CalAmp](#), [Ela innovation](#), [Sparkfun](#), and others, and [a solar panel](#) by Syscom. All the devices were chosen with extreme climate conditions in mind as they had to withstand high temperatures, humidity, sun, and salt.



Plans

The partner plans to deploy the solution in all the turtle encampments across the country. As for its feature set, the CTTMX specialists want to add the ability to track where newborn turtles go after being released into the ocean. It will help discover the places where they are being depredated or hunted and ensure their survival.

Results

With the implementation of the solution, CTTMX helped increase the number of newborn turtles in the 2020-2021 season, as well as their chances to survive and reproduce in the years to come, which will prevent the species extinction.

✓ Successful hatching of turtle eggs

The percentage of surviving newborn turtles drastically increased.

✓ Collecting scientific data

Analysis of the data collected allows scientists to run the statistical simulation and predict the performance in the next season.

✓ Temperature and humidity online monitoring

Scientists can instantly react if the values are out of the necessary range. They can also control the female to male newborn ratio as certain temperature influences the turtles' gender.

Company profile

IoT project of the year nomination: Stationary objects

Country: Mexico

Industry: Animal tracking

Solutions



Hardware



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