SEMTECH CASE STUDY

Green Stream

Flood Sensor Monitoring with Real-time Data

Green Stream Technologies Send Alerts When Water Levels Rise

Green Stream Technologies uses LoRa® and LoRaWAN® to enable real-time flood monitoring. With solar-powered sensors and cloud-based analytics, the system delivers timely water level alerts to municipalities, helping reduce flood risks, improve public safety and support smarter infrastructure planning.

QUICKFACTS

Company

Green Stream
greenstream.com

Customer Profile

Green Stream Technologies is an environmental technology company based in Hampton Roads, Virginia, delivering real-time flood monitoring solutions for smart cities. Using solar-powered sensors and LoRa®/LoRaWAN® connectivity, Green Stream provides accurate, low-cost water level data to help municipalities respond to flooding, improve public safety, and strengthen infrastructure resilience. With deployments across coastal and inland U.S. regions, the company partners with Semtech, Senet, and Old Dominion University to support data-driven decision-making and expand predictive flood prevention capabilities.

Solution Partner

Senet

Objectives

- Monitor real-time flooding data in coastal communities.
- Notify citizens of hazardous conditions.
- Reduce vehicle loss on impassable roadways.

Results

- Real-time flood monitoring end-to-end solution.
- Data integration with emergency management systems.
- Hyper-local weather alerts at a neighborhood level.

Products and Services

- LoRa® delivers low power wireless technology.
- LoRaWAN® network provided by Senet allows extensive coverage.
- Easy to install off-the-shelf LoRa-enabled ultrasonic sensors.

> You get to the intersection and see that it is flooded, but you have to get to work. There is no way to tell how deep the water is, so you drive into it and it's much deeper than anticipated. Hampton Roads lost several cars and two police vehicles during Hurricane Matthew.
>
> **Karen Lindquist,**
> *COO, Green Stream Technologies*

INTRODUCTION

Hampton Roads at Ground Zero

The metropolitan region in Southeastern Virginia called "Hampton Roads" is prone to flooding. The area is home to two million citizens and 14 military installations, including Langley Air Force Base and Naval Station Norfolk, the largest naval complex in the world. Like many of the 665 coastal communities in the U.S., this region regularly floods during moderate to heavy rains and high tides. Hampton Roads has the additional burden of experiencing land subsidence – the ground is sinking as sea levels rise.

Green Stream Technologies is an environmental technologies company. The business helps to create smarter, safer and more resilient communities with the power of Internet of Things (IoT) technology and data analytics.

CHALLENGE

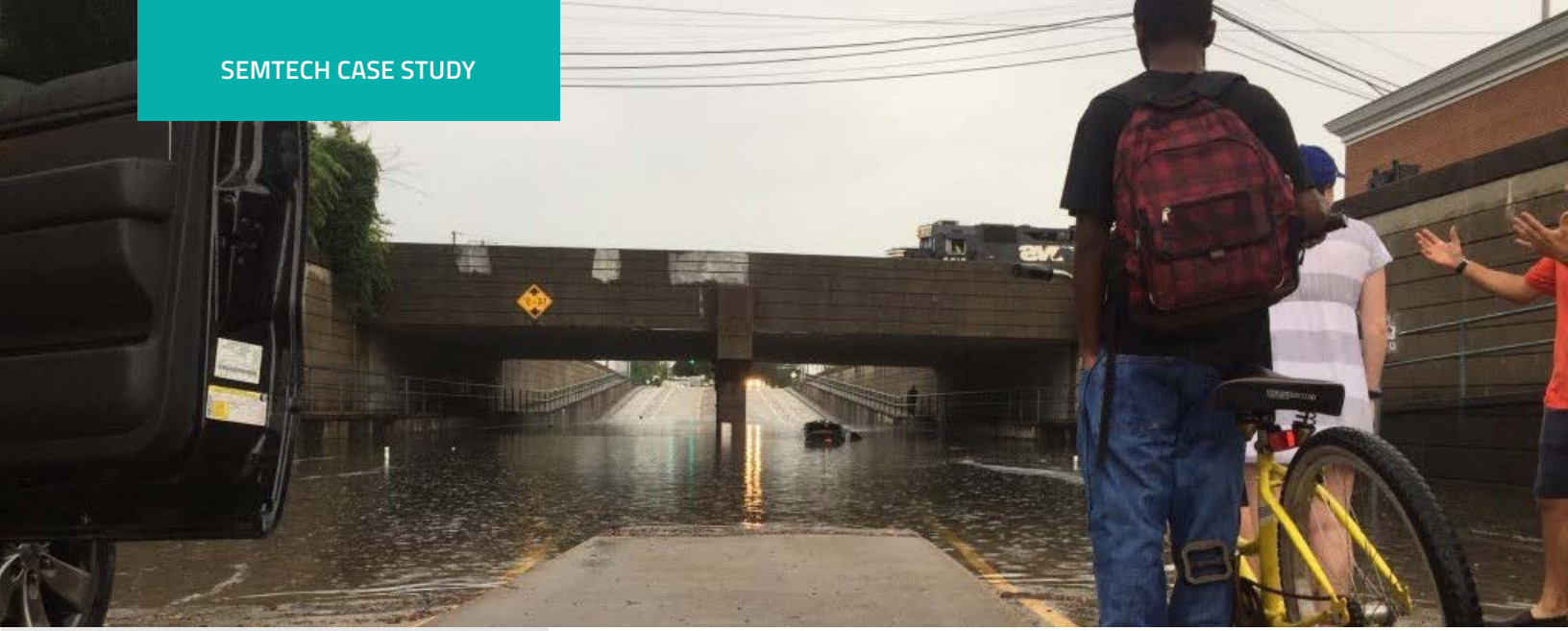
Recurrent flooding leaves neighborhood roads with standing water and stalled vehicles. The Director of IT Development for the City of Norfolk approached Jim Gray, an electrical and systems engineer, about the city's chronic flooding problem.

Green Stream looked at connectivity options. Wi-Fi did not provide the range needed and Cellular networking was not practical due to its battery consumption requirements.

SOLUTION

What started as an innovative pilot project to keep the city apprised of how high waters were getting and which roads were impassable is now Green Stream Technologies, which leverages Semtech's LoRa® devices and the LoRaWAN® open protocol.

Green Stream's end-to-end flood monitoring solutions are designed using commercial, off-the-shelf ultrasonic sensors and easy to deploy LoRa-enabled gateways. The data is communicated over a network provided by Senet, a leading provider of LoRaWAN services and platforms enabling IoT connectivity.



> I proposed using this new technology called LoRa devices in low-cost sensors to monitor flooding from bridges and poles.

Jim Gray,
President and CEO,
Green Stream Technologies

The Green Stream flood sensors are autonomous, requiring no external power or wired network connection. Each sensor is a self-contained, weather-proof, solar-powered unit that comes with a universal mounting bracket and extension arm. The sensors are small enough to be installed on top of crosswalks, light or electric poles and bridges. The rugged devices are positioned above a body of water or over dry land.

Green Stream systems measure the distance from the surface to the LoRa-enabled sensor and calculate the precise water height and depth. The data sampled is communicated in six-minute intervals to gateways and sent to the Green Stream Cloud. The flood data can be viewed on Green Stream's web-based dashboard or mobile devices. Green Stream also integrates into consumer smartphone apps like Waze and direct warning systems that provide push notifications.

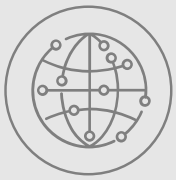
After a series of product prototyping, refinement and calibration testing, the first Green Stream deployment occurred in the City of Norfolk in April 2017, specifically in the Ghent neighborhood and around the Hague Footbridge. Deployments in Virginia Beach and numerous communities in North Carolina soon followed.

Green Stream is working with sea level rise experts at Old Dominion University's Department of Ocean, Earth & Atmospheric Sciences to establish a standard model for deployment in new areas – determining how many LoRa-enabled sensors are needed and where should they be placed. Green Stream is also working on a predictive analytics model utilizing ground water saturation sensors and hyper-local weather data to quickly predict and prevent flooding damage.

HOW IT WORKS:

The step-by-step process of Green Stream's LoRa-enabled solution.

> We are looking forward to working a lot more with Semtech and Senet. They are knowledgeable and provide a seamless collaborative process.
>
> **Karen Lindquist,** *COO, Green Stream Technologies*



> Part of our appeal is that while some municipalities may already have government-sponsored sensors in place, they are quite large and very expensive. We are hearing, 'for the same amount of money we pay for one sensor, we're getting 10 to 20 of yours' and the cost to maintain them drops drastically with our system.
>
> **Jim Gray,** *President and CEO, Green Stream Technologies*

BENEFITS

Green Stream's main customers are municipalities – at the state or local level – and private environmental firms. Green Stream's sales cycle is quite fast as system expenses often fall under pre-defined expenditure caps, eliminating the requirement for a cumbersome request for proposal (RFP) process.

Green Stream is expanding beyond Hampton Roads and coastal communities into U.S. inland communities around the Missouri River basin and into parts of the globe where Senet has deployed its network infrastructure.

About Semtech
Semtech Corporation (Nasdaq: SMTC) is a high-performance semiconductor, IoT systems and cloud connectivity service provider dedicated to delivering high-quality technology solutions that enable a smarter, more connected and sustainable planet. Our global teams are committed to empowering solution architects and application developers to develop breakthrough products for the infrastructure, industrial and consumer markets.

To learn more about Semtech technology, visit us at **Semtech.com** or follow us on **LinkedIn** or **X.**