Toward an IoT framework for camera image velocity gaging

Using AWS IoT & GreenGrass for edge computing

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INTRO

- Streamflow in **flooding rivers** can be sometimes **hard to quantify** due to remote locations, super flashy sites, or safety concerns
- We have been developing computer vision tech to **compute water velocity** and streamflow **from videos** for the past 2.5 years
- Current processes are effective, but require lots of care & feeding, and in-office processing
- *Can we use cloud computing, IoT, and edge processing to overcome these issues?*

APPROACH

1. Get our data collection platform (Raspberry Pi 3 B+) sending videos to AWS S3 bucket

2. Port existing processing scripts to AWS Lambda functions

3. Move AWS Lambdas to the edge with AWS GreenGrass (to extent possible)

EARLY SUCCESSES

- Gage installed and transmitting to S3 bucket

- Working through first translations of processing scripts to AWS Lambdas now

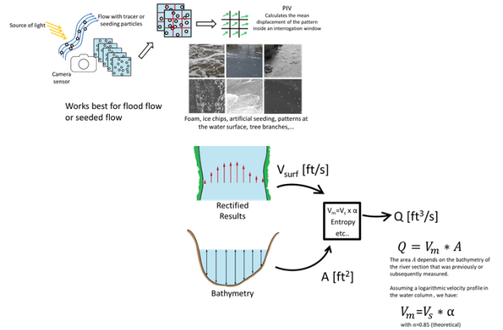
USGS science for a changing world
Surface Velocity Workgroup
CHS

We are using **cloud processing** and **IoT smart sensors** to measure **river streamflow** with web-cameras.

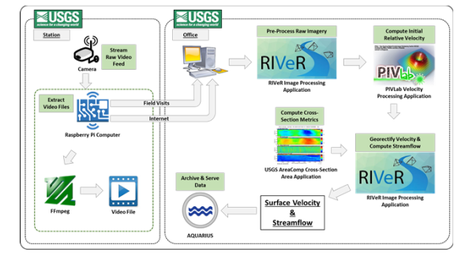
Take a picture to get **more** information

Why the **strange** poster **format**?

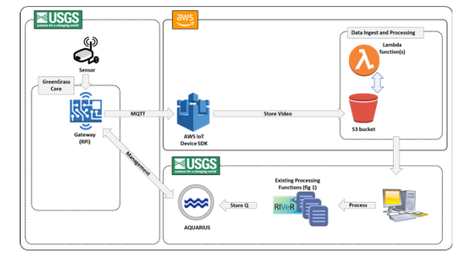
GETTING STREAMFLOW FROM VIDEO



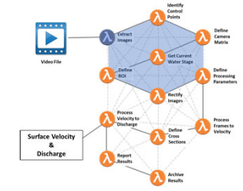
CURRENT WORKFLOW



WHERE WE ARE NOW



SCOPE OF CDI WORK



We hope to port as many scripts as possible from existing software to AWS Lambda

Aiming to push bandwidth-intensive Lambdas to the edge (e.g. blue shaded)

OUR LOFTY GOAL