FloodAware.net: Community-based Automated Information for Urban Flooding

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Background

FloodAware integrates urban cameras, sensors, social media, and direct citizen reporting into a monitoring network (IFSON) to drive real-time modeling and prediction of roadway flooding, and communication of flood risks to communities and authorities.

Integrated Flood Stage Observation Network (IFSON)
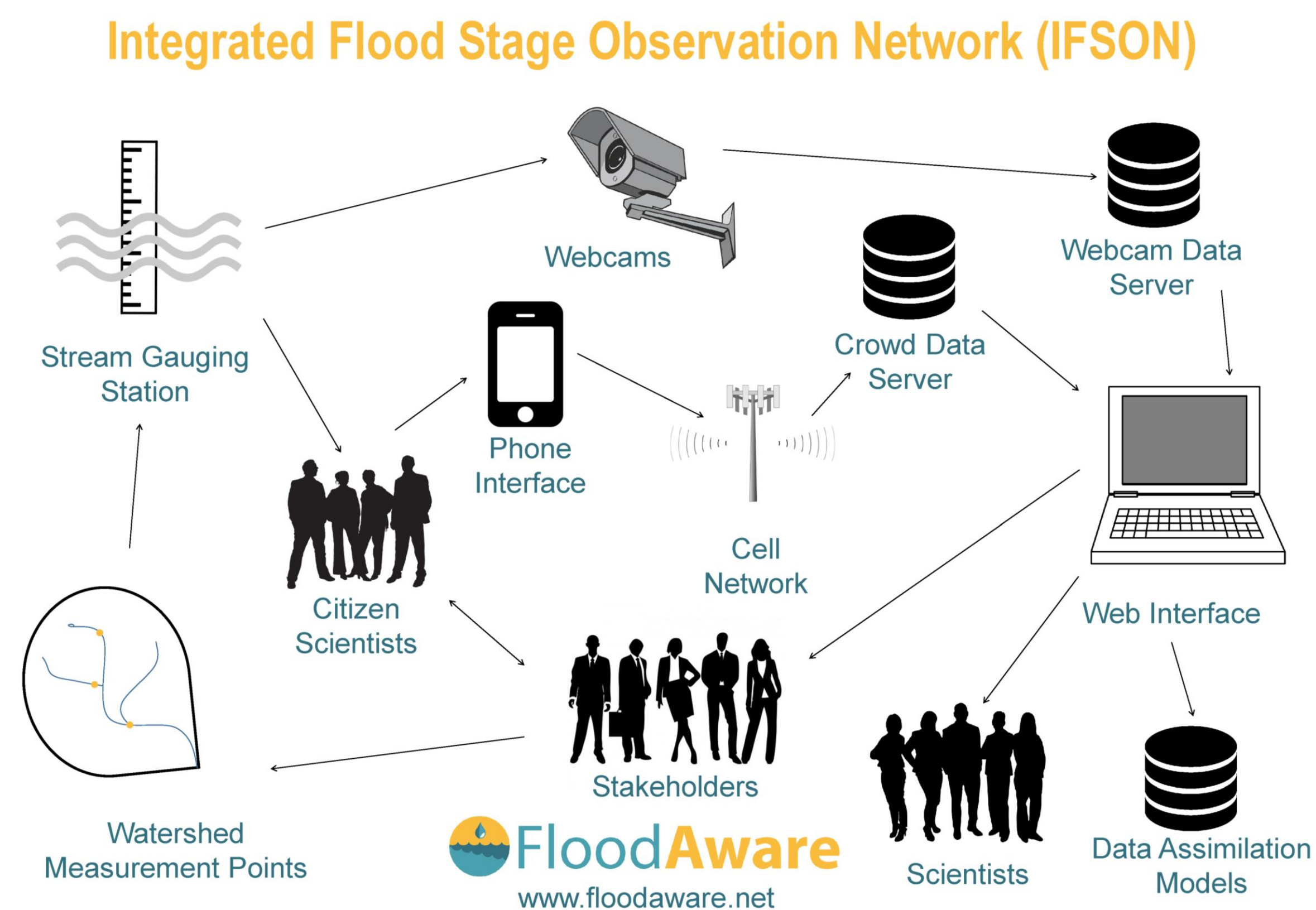
Advancements

Technological: Developed specialized solar-powered, cellular-connected camera systems; Created image recognition algorithms for public-facing traffic cameras; Established a cloud-based server with automated data collection protocols; Advanced urban hydrologic models using new data streams; Created web and mobile communication platforms.

Social: Community and citizen science-driven technology development and use. Team has worked with communities to identify problem spaces and best cases for flood risk information, ultimately driving technology development.

Community Engagement

Piloted efforts in Flagstaff, Phoenix, and Tucson. Expanded efforts to New York City, Atlanta, and Portland, with community stakeholders and infrastructure managers involved in each city. Ran virtual workshops involving federal, state, and local stakeholders, and created a training and education program for future collaborators.

Products: 5 publications; 1 in-review; 2 in prep; 6 software prototypes; 1 hardware prototype; interactive flood risk website; education program.

Broader Impact

Immediate: Current capacities allow for stakeholders to view live camera feeds of flood-prone areas, monitor flood-prone areas online, explore fine-scale hydrologic modeling of pilot areas, and learn how to protect people and assets from flooding.

Long-Term: The project outcomes are well positioned to mitigate flood risk in the US and beyond. The technologies developed are deployable to flood-prone environments and are capable of providing remarkable new insights to communities on flood risks.

Next Steps

- Advance hydrological forecasting
- Refine web and mobile applications
- Integrate data collection with model
- Improve social media mining
- Manage citizen science platforms