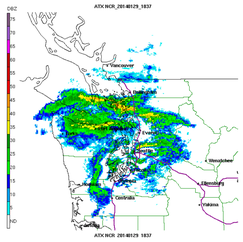
Seattle RainWatch and Enhanced Weather Forecasting as Climate Adaptation, or:

Nowcasting Towards Resilience

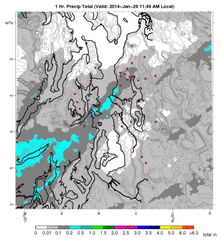
A More Accurate Short-Term Forecast

Radar > Rain Gauges > Calibration > Verification > Experimentation > Website

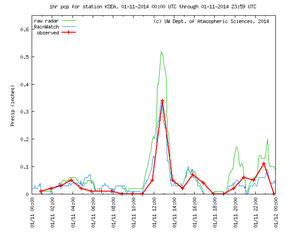


Local radar image (KATX, via UW). Provides great sense of approaching precipitation, but does not help tell what's happening on the ground.

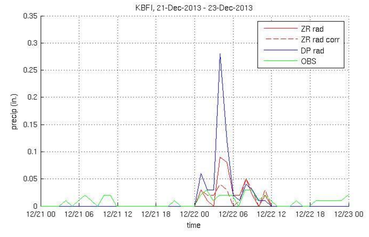
One of 17 tipping bucket rain gauges owned and operated citywide by Seattle Public Utilities (SPU); provides accurate rainfall data, but does not look forward.



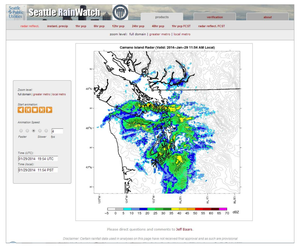
Rainfall estimates derived from radar are calibrated with SPU (and other area) rain gauges.



Nowcasts are made using radar echo motion vectors and are extrapolated outward temporally and spatially; accuracy is verified.



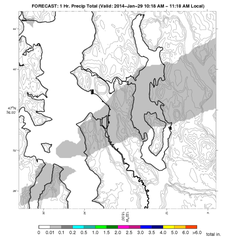
The system is used to test local meteorology, including (in the example above) the performance of KATX dual-polarization.



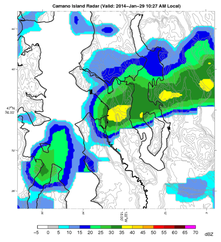
A variety of RainWatch products are made available online to SPU and the public.

Nowcasting Operationally

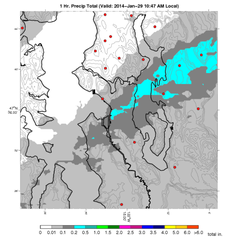
Nowcasts > Neighborhoods > Alerts > Storm Totals > Emergency Mgmt > Integrated Ctrl



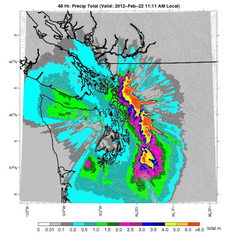
At the heart of RainWatch is a 1-hour precipitation forecast alert. When SPU-established thresholds are met somewhere over Seattle, detailed emails are sent to a list.



Developing precipitation cells are followed at an unprecedented sub-basin scale, enabling utility managers to pinpoint potential impacts.



When intense rainfall is not predicted by the system, RainWatch also generates accumulation alerts at various intensity/duration thresholds.



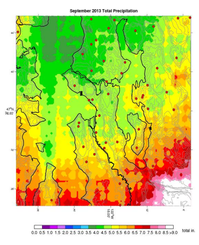
The system also tracks 24- and 48-hour accumulations that put isolated events into perspective and provide system saturation insights.

RainWatch has yet to be used to deploy crews in advance of heavy rainfall, but the potential exists.

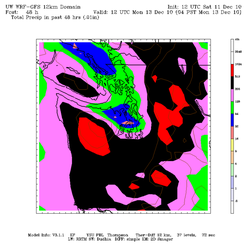
A goal is to use RainWatch to improve the performance of SPU's drainage system, for example, by rapidly increasing storage capacity in response to alerts.

Adapting to Uncertainty

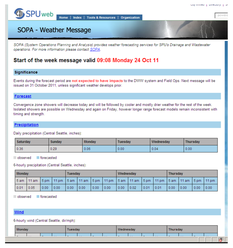
Climatology > Research > Forecasting > Big Data > No Regrets > Resilience



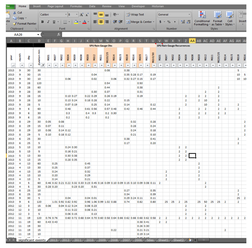
RainWatch has the ability to show high-resolution precipitation climatology.



A goal is to integrate RainWatch with other forecasting tools such as the UW WRF, already supported in part by SPU, to create a broad spectrum of awareness.



SPU has developed an internal weather forecasting service that utilizes custom forecasting products and provides impacts-specific predictions.



Wx forecast data is related to historical obs, maintenance records, customer data, among other relevant information, and is helping SPU move from being a data rich to a knowledge rich organization.

Given climate change uncertainty, and drawing upon lessons learned in SPU's water supply business, RainWatch is viewed as a "no regrets" adaptation strategy.

Seattle Public Utilities is committed to understanding and preparing for the impacts that climate change will have on the infrastructure we manage and the essential services it provides.