

A wide-angle photograph of the Golden Gate Bridge in San Francisco, California. The bridge's iconic orange-red towers and suspension cables are prominent against a clear blue sky. The bridge spans across the Golden Gate Strait, with the city of San Francisco visible in the distance on the left and the Marin Peninsula on the right. The water is a deep blue, and the overall scene is bright and clear.

AQPI

Advanced Quantitative Precipitation Information

Users Group #2

May 18, 2020, 12:00 pm PCT

<https://www.gotomeet.me/JenniferKrebs>

Or: [+1 \(872\) 240-3311](tel:+18722403311) Access Code: 828-102-133

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Advanced Quantitative Precipitation Information

Time	Topic	Lead
12:00	Introductions	Hilary
12:05	Go To Logistics – Muting, Chat Box, Questions, etc.	Jennifer
12:10	Summary of January Users Group Take-Aways	Greg
12:20	New AQPI Products <ul style="list-style-type: none">• 1:1 Discussions recap• New observation sites and telemetering of existing sites• Radar site status and next storm season• Precipitation Products• Modeling• National Water Model• CoSMoS• Q&A	Greg Greg & Hilary Allen Chandra Haonan Lynn Liv & Babak Rob
1:00	User Interface Demo	Greg, Michael, & Hilary
1:20	AQPI Watershed Modeling Working Group Overview	Greg
1:25	Wastewater Working Group Overview	Jennifer
1:30	Next Steps Discussion <ul style="list-style-type: none">• Getting connected what to do? Getting Help?• Do we have your needs captured?• Engagement throughout the summer• Case Studies• Next Meeting	Hilary
2:00	Adjourn	

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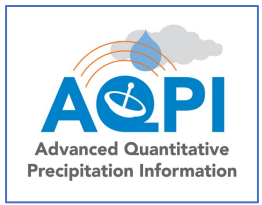
AQPI

Advanced Quantitative Precipitation Information

Meeting Logistics to keep things moving along

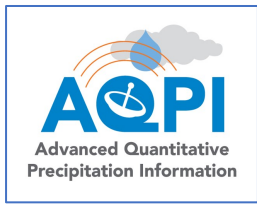
- Stay on mute, except for group discussion times.
- Rob Cifelli will pose questions to the group to get feedback. Answer in chat.
- Post questions in chat. Rob will monitor & pose the question at a strategic time or get back to you later.
- There will be times for group discussion: Please be brief. If you agree with a previous speaker, say “Ditto” or “Copy that!” Or type an amplification into chat. *Don't be a repeater, be a repeater, be a repeater...*

User Group Take-Aways



- First User Group Jan-24, 2020 – (Great turn out and awesome participation.)
 - Two/Year
 - September – Focus on tools and data available on AQPI system during rainy season.
 - May - Discuss what worked, what didn't, and how to improve for next season.
 - We want all meetings to be highly interactive. So please ask question via chat.
- Work with users wanting machine-to-machine data transfers to inform user applications.
 - 7 groups requested to engage.
 - Working on access and providing data.
- Working Groups (Led and run by water agencies)
 - Share experiences, learn from each other, collaborate.
 - Watershed modeling and Wastewater.

AQPI Products and Services

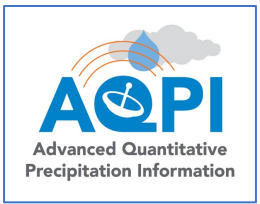


- Working with Santa Clara Valley Water on:

Water Model Precipitation Input								
Time	-2 Day	-1 Day	0 Hour	1 Hour	2 Hour	3 Hour	...	60 Hour
Data Type	Precipitation Estimate		NowCast		Precipitation Forecast			
Product Time Step	15 Minute				1 Hour			
Update Frequency	1 Hour							

- ESRI ASCII gridded file format
- Alameda County Public Works Agency working on real-time water model feeds using Local Data Manager (LDM) software from Unidata.
- Working with modeling teams to operationalize models.
 - Radar
 - CoSMoS
- Developing web interface for users.
- Started work to pulling in agency data (start with the easy ones).
 - OneRain
 - Datawise

One on One Process



- Meet with agencies individually to gather requirements and feedback on system.
- We have met with all agencies at least once.
- Agency folders on google drive
 - Requirements.
 - Agency observation sites.
 - Action items.
 - Meeting notes.
 - Recorded meetings.
 - Folder containing agency GIS information.

Surface Observations

- AQPI will install ~20 surface rain gauges at locations suggested by AQPI Development Team to help optimize performance of AQPI radar rainfall estimates.
- Should we form a Surface Observations Working Group (SOWG)?
 - The SOWG could review and comment on the rain gauge deployment plan.
- SFPUC and others: On how many gauges would you like us to install data telemetry? Where are these gauges located?
- Several agencies have contacted One Rain and given them permission to share their gauge data with the AQPI system. THANK YOU!





AQPI Users Group Meeting

Radar & Precipitation Products

18 May 2020

Contacts:

Rob.Cifelli@noaa.gov

Chandra@colostate.edu

Haonan.Chen@noaa.gov

AQPI Radar Status for the 2020/2021 Storm Season



- Small (large) circles are 40 (150) km coverage rings.
- A permanent radar has been deployed at Santa Clara Penitencia Water Treatment Plant (37.3989N, 121.8334W).
- A temporary radar has been deployed near Sonoma County Airport (38.5216N, 122.8023W).

- A permanent radar is being deployed near Rocky Ridge for the 2020/2021 storm season.
- Another radar is planned for deployment near Montara Peak for the 2020/2021 storm season.

Recent Development of AQPI Rainfall Product

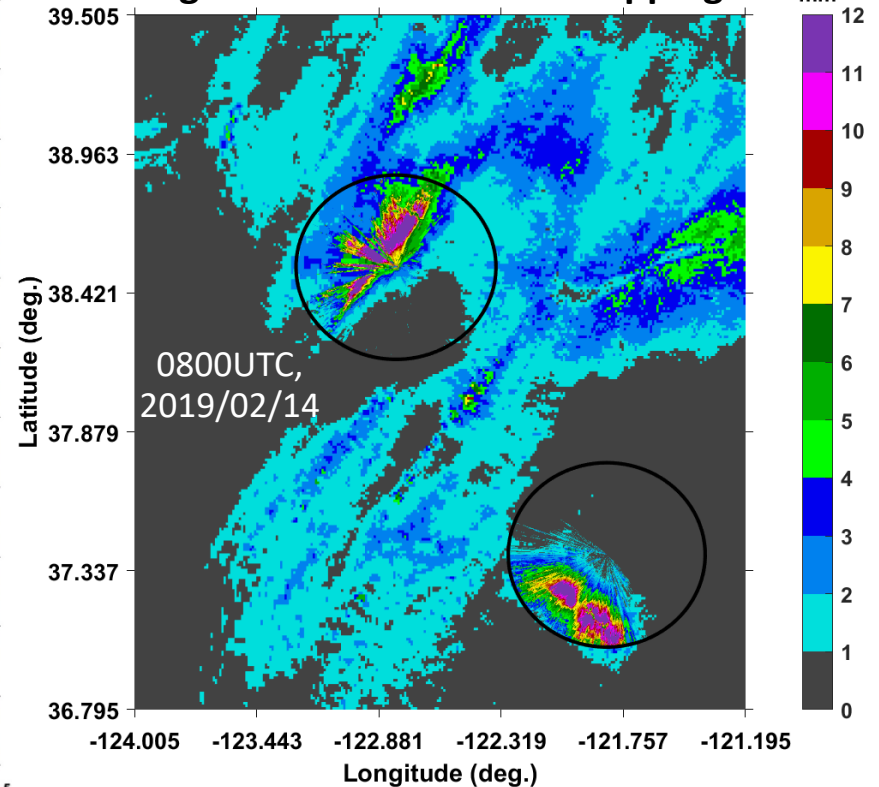


Rainfall product domain:

Lat: [36.795:0.0025:39.505]

Long: [-124.005:0.0025:-121.195]

High-resolution Rainfall mapping



Current rainfall product:

- Instantaneous rainfall rate
- Hourly rainfall accumulation

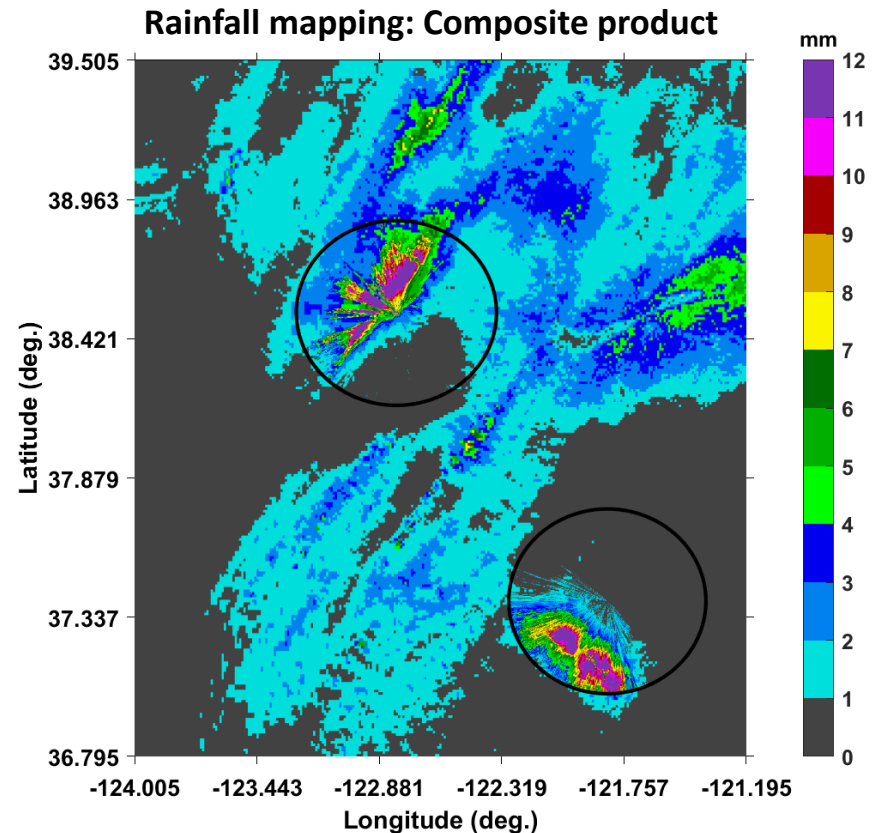
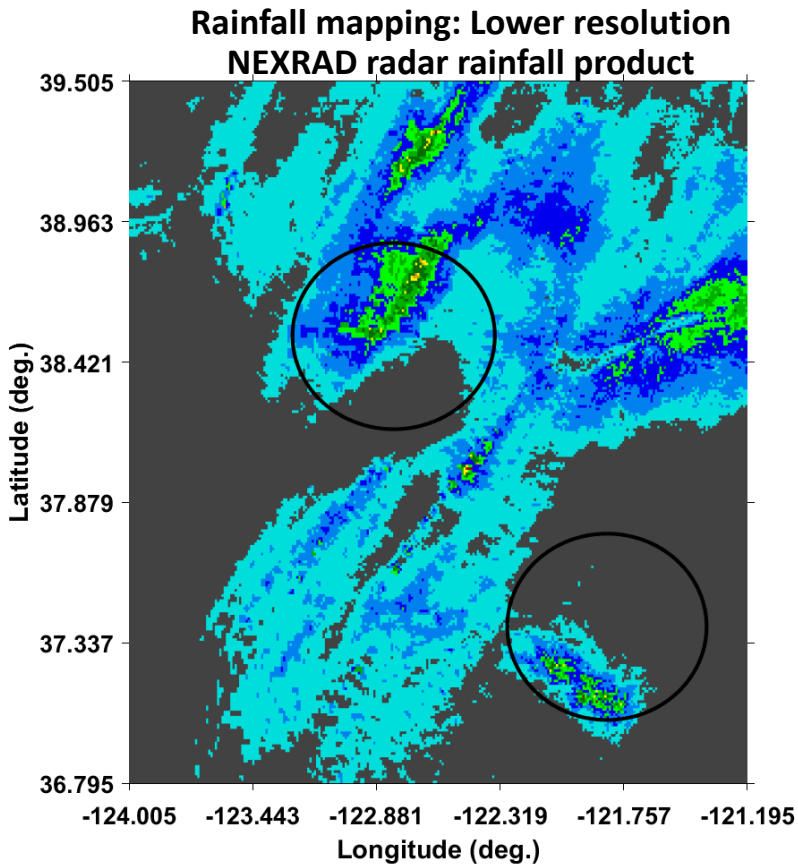
Rainfall product resolution: 250 m X 250 m X 2 min

Next steps: Products for 2020/2021 storm season

- Incorporating real-time gauge data in AQPI radar rainfall mapping;
- Blending rainfall nowcast product with weather model forecasts to provide short term (0-2hrs) rainfall prediction;
- Training on AQPI rainfall product;
- Creating derived rainfall products based on users' requirements (e.g., 15-min rainfall; maximum and/or average rainfall for a certain period);
- Continue working with local agencies on case studies.

Backup slides

Merging AQPI radar and NWS/NEXRAD rainfall product



- Downscaling technique has been developed for NWS/NEXRAD rainfall product;
- Blended product has much higher resolution (250m X 250m X 2min).

Notes from the 1st Users Group Meeting

Q: What goes into MRMS vs. the AQPI rainfall product?

A: Currently, MRMS is only using NEXRAD data for rainfall mapping. AQPI rainfall incorporates high-resolution X-band data and enhanced MRMS rainfall estimates. AQPI rainfall product has much higher resolution, i.e., 250m X 250m X 2min.

Q: Will AQPI have its own gridded QPE?

A: Yes. The grid resolution is 250m X 250m X 2min. Will be able to adjust the grid size based on the users' requirements.

Q: Does the RFC have plans to incorporate AQPI QPE?

A: High-resolution AQPI radar data are made available to MRMS and RFC. But MRMS rainfall product resolution is lower than AQPI rainfall product.

Q: Will point QPE data be available at higher time resolution (than one hour) for small streams that are susceptible to flash flooding?

A: Yes. Point data can be created for small streams. Mean areal rainfall can be generated for relatively larger watersheds.

Comment (City of Hayward): The critical problem for managing combined sewer/stormwater is peak flows, not daily flows.

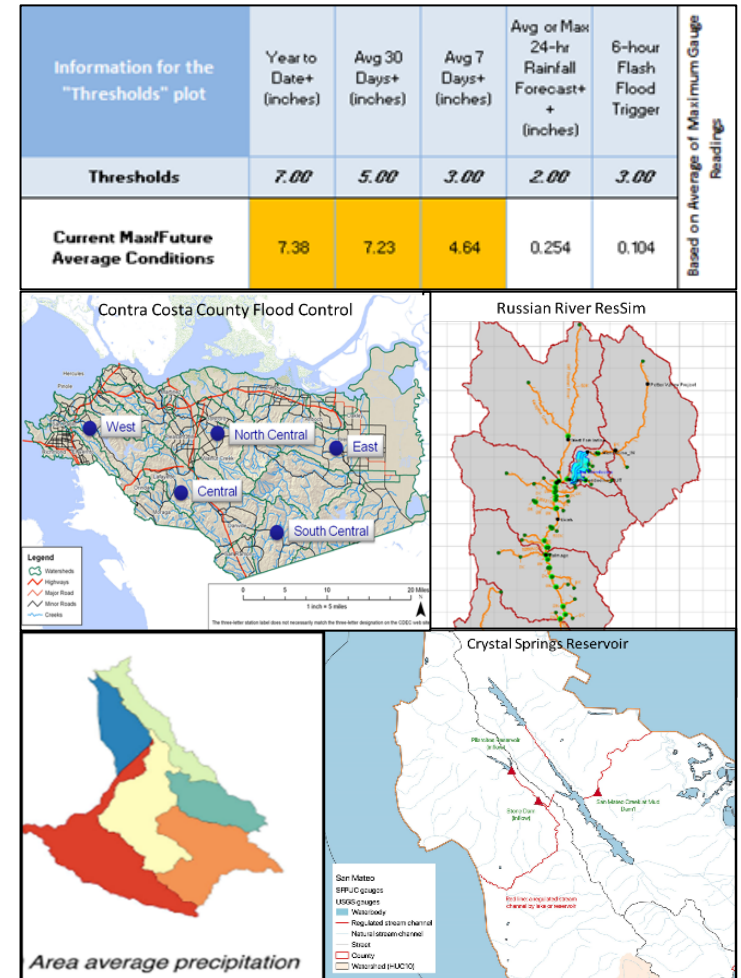
A: 3-hr forecast/nowcast will be useful in this case.

Comment (Alexi): Case study focused on discharge/wastewater will show the impact of QPE data every 250 m and every 2 min.

A: We have been working with local agencies on case studies. Already got interesting results in collaboration with Valley Water.

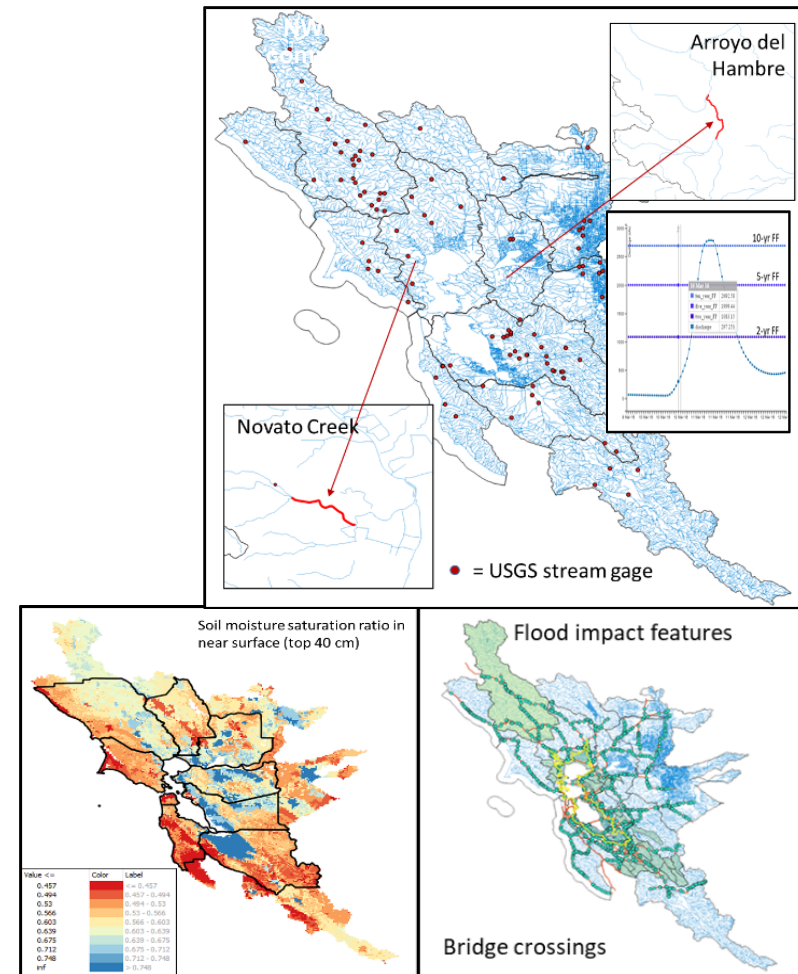
AQPI Local Applications

- AQPI system to provide precipitation and streamflow forecasts for points, zones and watersheds as desired.
- County Flood Forecast Tools
 - QPE & QPF precipitation amounts are accumulated can be provided for the 7-5-3-2 application, and 6-hour Flash Flood Trigger.
 - Contra Costa (M. Boucher) and Marin (R. Leventhal)
 - Precipitation forecasts can be provided for HEC-RAS model.
 - Santa Clara Water (J. Xu and L. Xu)
- Reservoir Operations
 - Reservoirs and their operation not well represented in NWM
 - NWM inflows to reservoirs can be provided.
 - SFPUC - Crystal Springs Reservoir (A. Dufour, R. Pluche)
 - Demonstration conducted for Lake Mendocino ResSim model linked with NWM.
 - Sonoma County Water (C. Delaney)



AQPI Using National Water Model

- NWM prototype deployed nationwide
 - <http://water.noaa.gov/>
 - 1-km grid for water balance
 - ~11,000 reaches for AQPI area
- NWM simulations are issued for four time frames:
 - Analysis (-3 to 0 hrs)
 - Short-range (1 to 18 hrs) for AQPI
 - Medium range (out to 10 days)
 - Long-range (out to 30 days)
- Variety of products are generated by the NWM, including:
 - Network portrayal of stream flow.
 - Hydrographs of streamflow for any user-selected stream segment.
 - Flow frequency portrayal.
 - Grid images of surface runoff, soil moisture, ponded depth
- Impact features
 - Bridge crossings
 - Critical facilities
 - Site specific alerts



CoSMoS Setup

Coupled Water Level (Delft3D-FM) and Wave Model (SWAN)

Tributaries Inputs

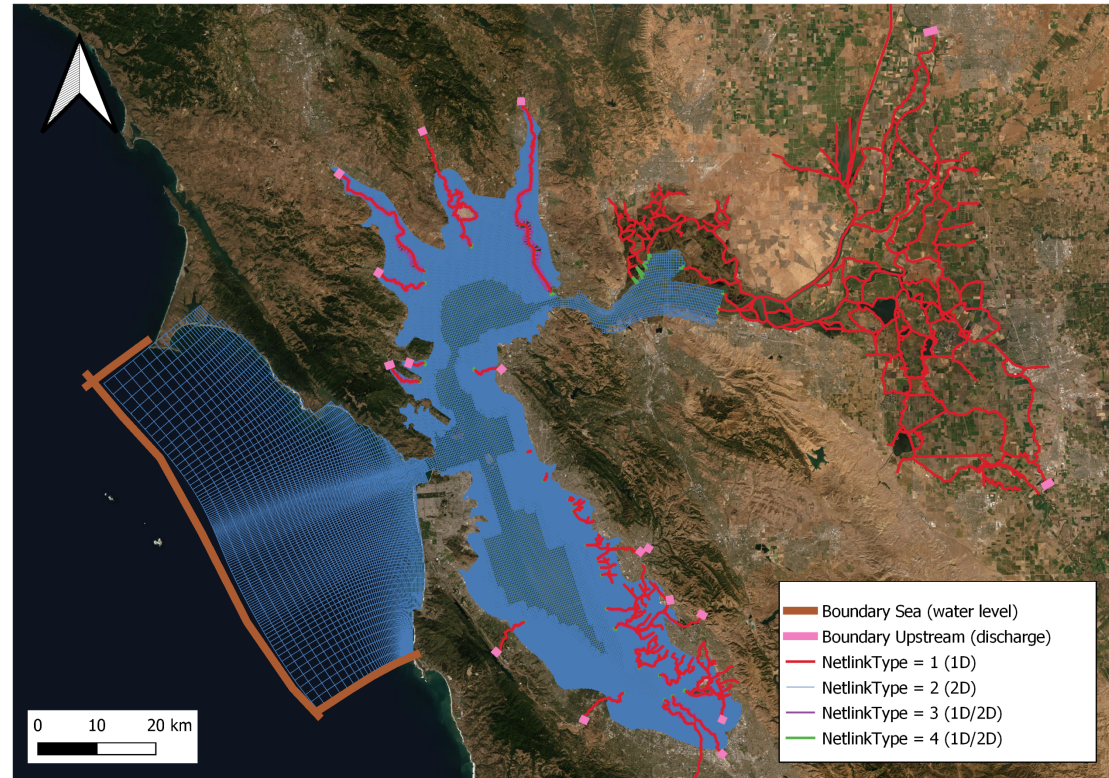
- **Discharge Forecasts (NWM)**
 - We are working on adding more tributaries

Offshore Boundary

- **Astronomical Tides**
- **Sea Surface Anomalies from Global Water Level Forecast System (HYCOM)**
 - We are also working with NOS to nest our model into their West Coast Operational Forecast System (WCOFS)
- **Offshore Wave Parameters from Global Wave Model (WaveWatchIII)**

Atmospheric Inputs

- **Surface Mean Sea-Level Pressure (HRRR)**
- **Surface Wind Velocities (HRRR)**
- **Precipitation (HRRR)**



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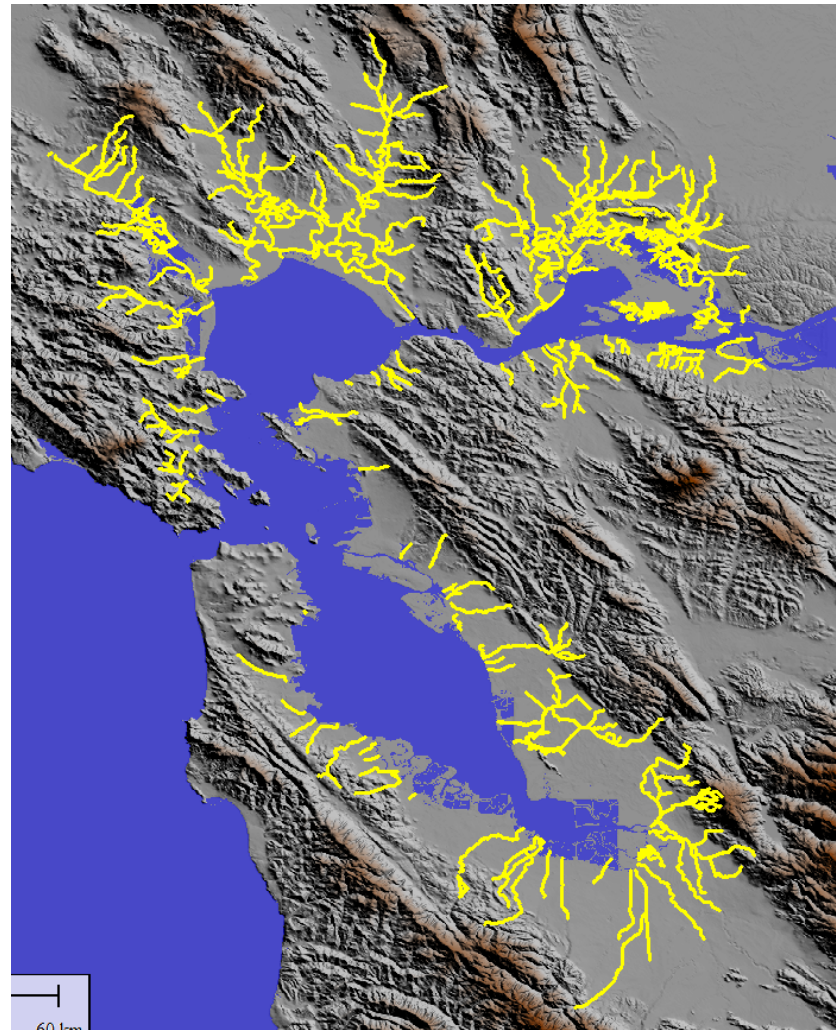
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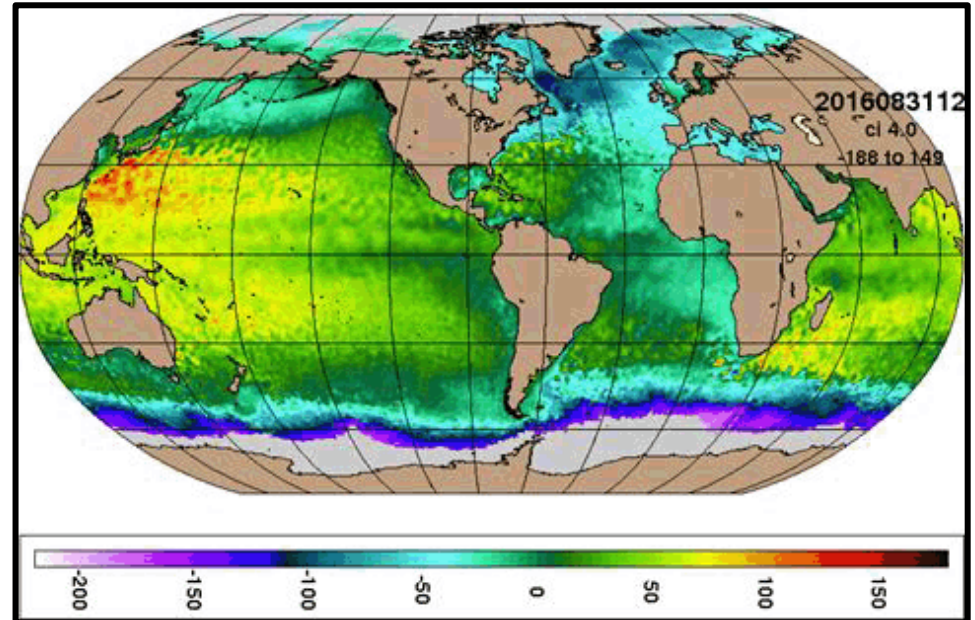
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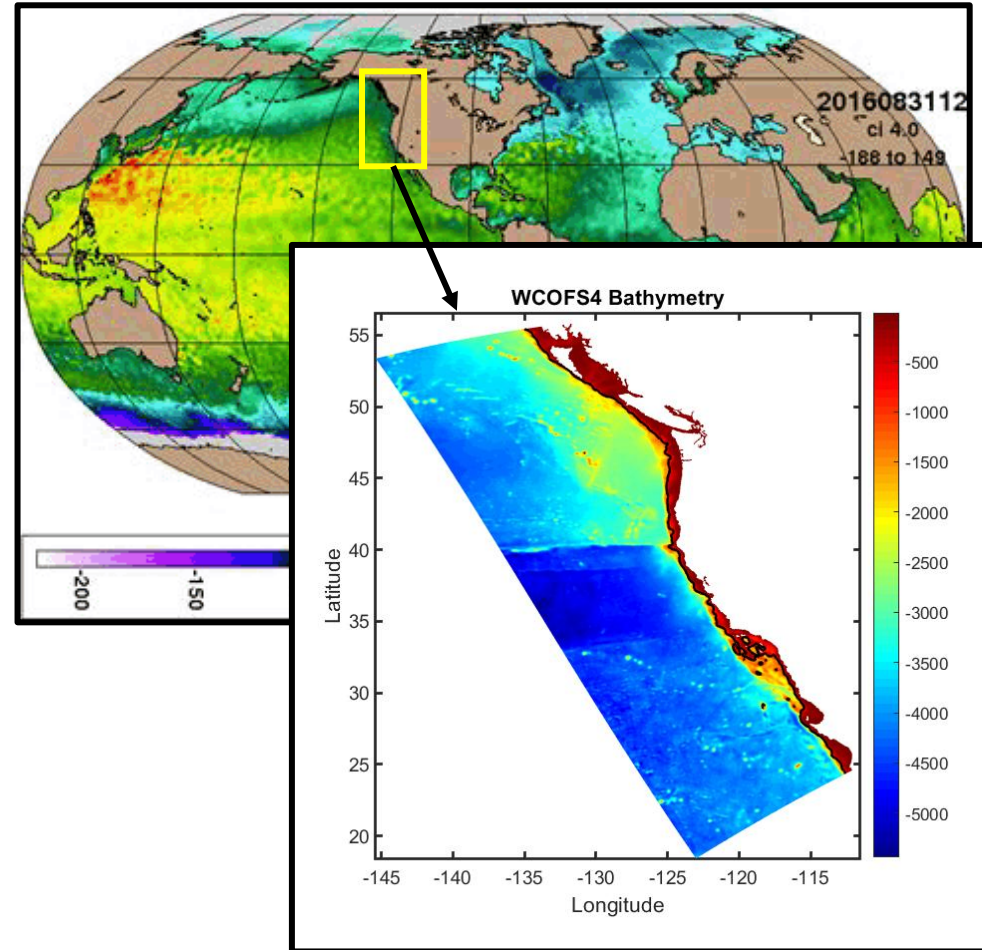
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Machine to Machine Data Transfer

- Variables
 - Water Levels
 - Inundation Extent
 - Velocities
 - Time of Peak Flood
- Data Type
 1. Spatial
 2. Cross-section
 3. Point
- Monitor and Alert Criteria



Machine to Machine Data Transfer

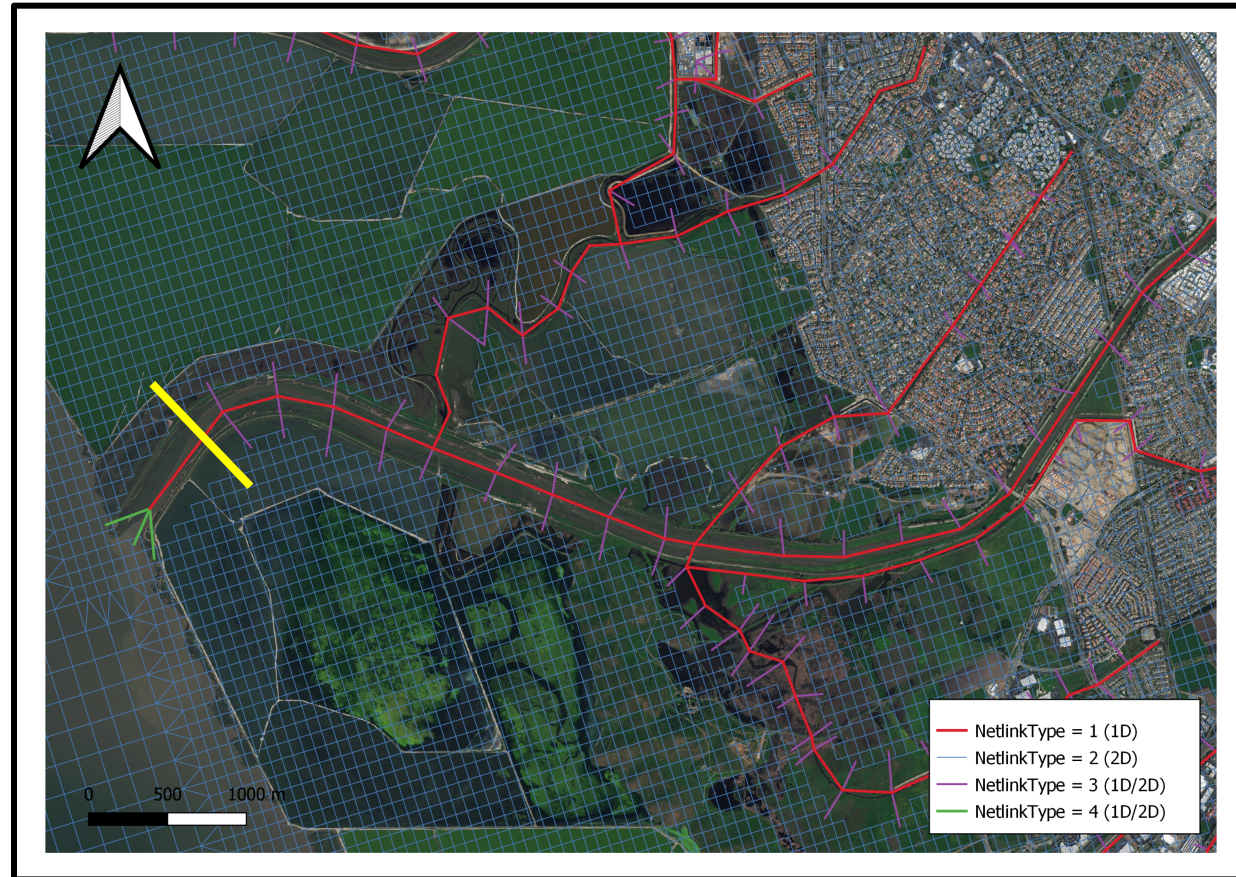
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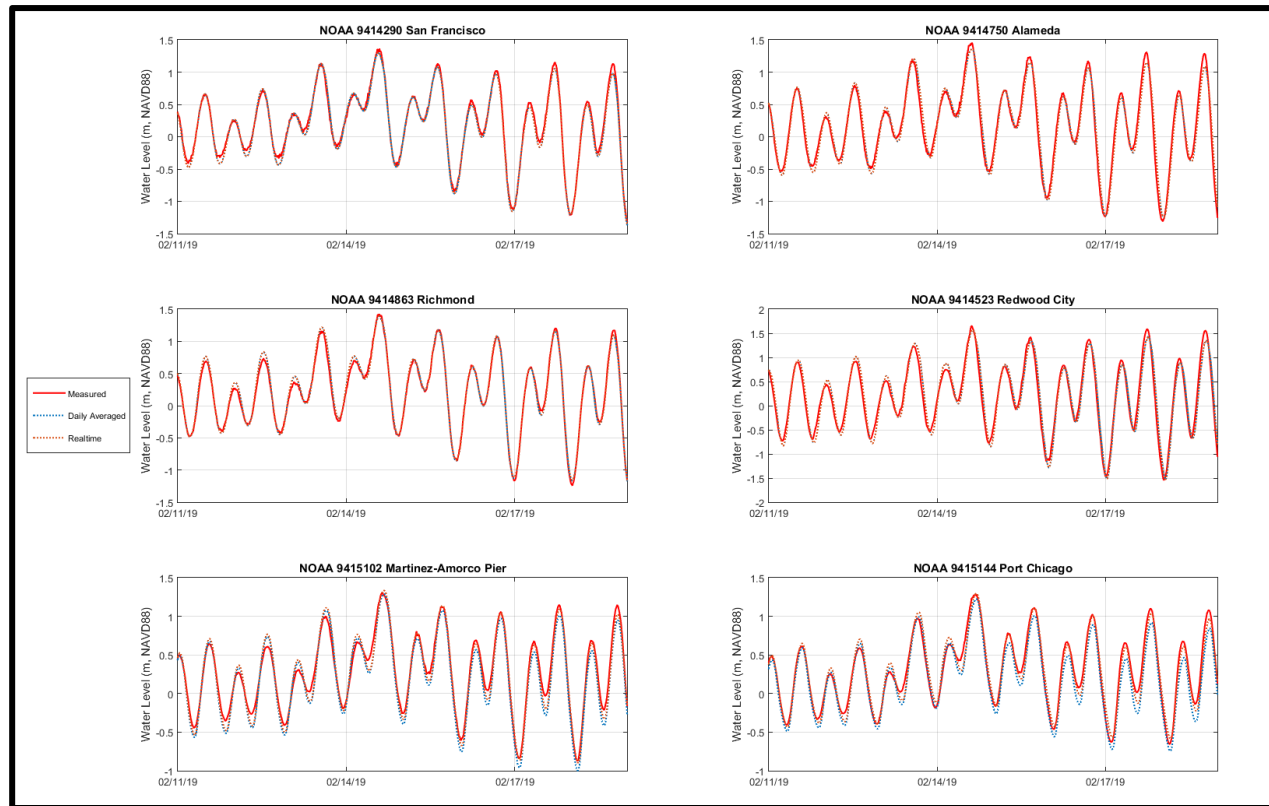
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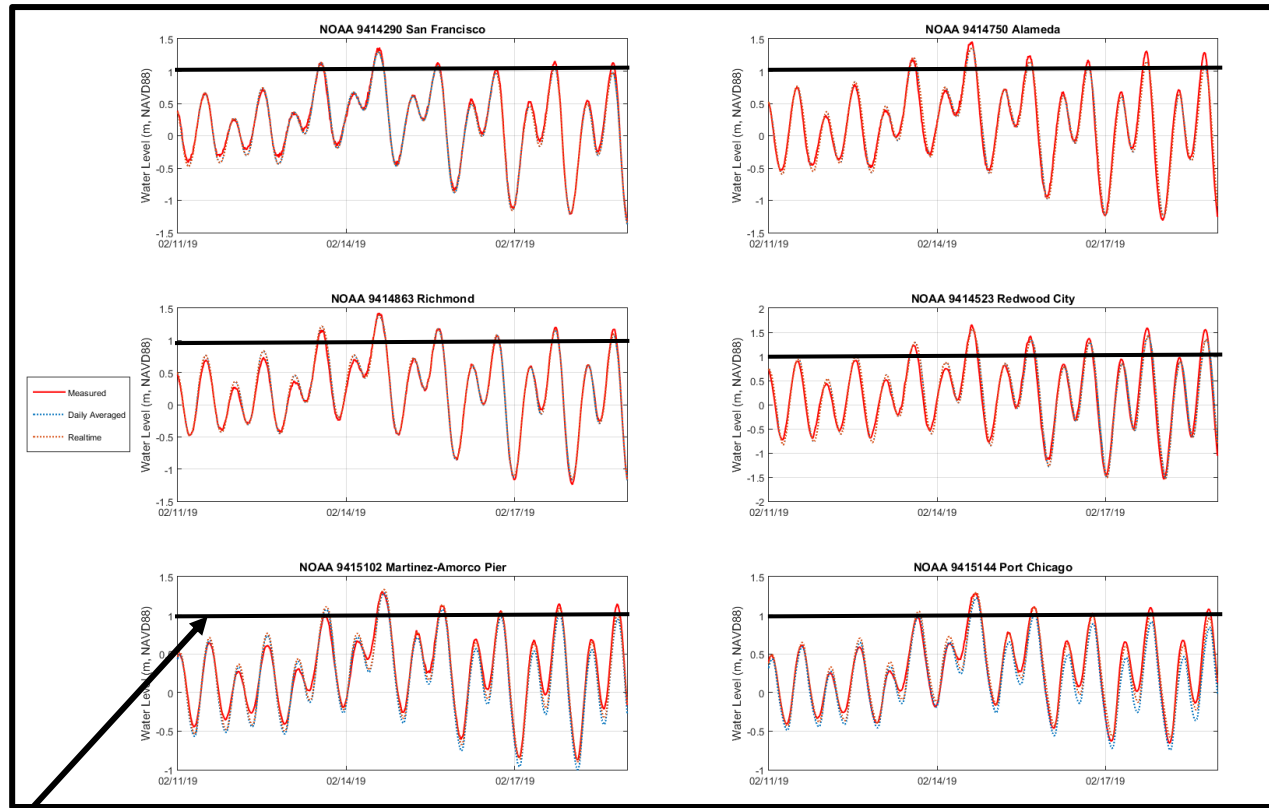
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Watershed Modeling Working Group Overview



- First meeting this Wednesday May 20, 2020
- Run by agencies.
- Foster collaboration between agencies.
- Best practices.
- Agencies to determine what they want to get out of working group meetings.
- Improvements to system for water model use.

Wastewater Working Group

- Concept – collaborate with EBDA agencies, a collection of wastewater operators.
- Elaborate problems, interests and needs.
- Begin in August, September 2020.
- Add agencies as makes sense.

Next steps: One on One Meetings

1:1 Timeline

1. Machine to Machine - data grabbing folks
2. Graphics - everyone else
3. Alerting & Monitoring specifics - all agencies

Meeting goals

Login, FTP access to AQPI User Interface

Tailor as much as possible to meet your specific needs

A grayscale topographic map of a region, likely a mountain range, showing contour lines and terrain features. The map is oriented horizontally and serves as the background for the text.

Numerical data now, graphical data summer

In order to get the most out of these we will need:

GIS points and areas of interest

highways, parking lots, dams, water treatment facility, rivers to watch, watershed boundaries

Alert/monitoring thresholds

atmospheric and hydrologic forecasts for points ie. 5 days out alert to watch your area to start looking at the data, get it flowing ALSO real-time models and observations -- MADIS & county rain gauges, radar nowcast

Case Studies

Potential topics:

CoSMoS - tidal influence on stream water levels

Radar & Rainfall products - QPE, Nowcast, QPF

HRRR - atmospheric modeling accuracy

National Water Model/ Tributary Hydrology

A grayscale topographic map of a region, likely a watershed, showing contour lines and terrain features. The map is the background for the text.

Working Groups

Watershed Modeling (machine to machine)

Wastewater

Ground Observations