Nervous Norman

1. I see a storm is coming, will it flood near me? (Yes or No)
2. Is my home at 123 Main St, Anytown,USA in danger of being flooded during the approaching weather system?
3. Will I have access to food, power and fuel during this storm?
4. How long will I have to ride out the storm?
5. Is there a possibility of damage to my house?
6. Will I need to evacuate? If so, how soon and what is the safest route?
7. Will my water be safe to drink? Is there contamination in nearby water resources?
8. Alert me when a risk point in the given bounding box is predicted to be flooded.
9. Whom do I contact to report flooding near my house?
10. I'm considering purchasing 124 Main St, Anytown, USA. Tell me how often it has flooded in the past?
11. I'm a business owner that needs to shut down operations. How long will the flooding last? When will I be able to return to the area to restart operations?
12. How do I claim flood insurance? Should I move or stay in the long-term?

Powerful Pete

1. I see a storm is coming, will the lat/lon (aka my substation) be in danger of flooding?
2. Which of the given substations may flood during the coming weather system?
3. Which substations do I need to shut down (need warning of 30 min before flood depth reaches 2ft) and how could it impact other critical infrastructure?
4. Which catchments/water sources, if flooded, will impact my downstream substations?
    a. Alert me when one of these is predicted to flood.
5. Which access roads will be flooded and for how long?
6. Forecasted depth of flooded water.
7. Weather forecast.
8. Cascading failure: would the flooded substation cause other parts of the power grid to fail?
9. How many customers and where would be affected?
10. Would any critical infrastructure get affected?
11. When should I restart inactive substations?
12. Should I prestage employees? If so, when and where?
13. What is the best route for employees to reach work? Reach inactive substations?
14. Which part of the system is most vulnerable to power outages?
15. What is the likelihood of losing power at pumping stations and other infrastructure in the future?
16. The city is planning to install a new substation in the network in ABC community. Which is the safest location to install this substation?

Emergency Erica

1. I want to plan evacuation routes and staging of resources. What roadways will be flooded in my county and when?
2. Alert me when one of these selected risk points is predicted to flood?
3. Which neighborhoods will be affected first and should be evacuated earlier?
4. Will any neighborhood lose power during the event?
5. My crew needs to go to location X (or return to base from location X). Find them a safe route!
6. I need the list of infrastructure (road, bridges, levees, etc.) that will be flooded. How can I quickly generate this list?
7. Alert me 48-72 hours in advance if there is a chance of flooding in my city.
8. Can people use your app to notify us of their location and if they need help?
9. Beside the inundation prediction map, can I see an inundation map with spatial probability of getting inundated?
10. SImilar to Pin2Flood and based on flow depth and velocity, can I see which category of resources I should mobilize? (If the depth and velocity is high, I may need to use helicopters instead of ground vehicles)
11. Can UFOKN design an evacuation plan based on spatial inundation map? (this can be critical for big cities)

Stormwater Susan

A high intensity rainfall event is expected to hit the city (Anytown, USA) in the next couple of days. The following are the short term questions either before or during the storm:

1. Will the event overwhelm the stormwater system capacity? If so, which locations are the most vulnerable?
2. Which residents, businesses, and areas (neighborhood scale) are at risk of flooding?
3. Are overland flow relief paths adequate to convey stormwater without impacting dwellings for the forecasted event?
4. How will the upcoming rainfall event impact the sanitary sewer system? Is there a risk of sewer overflow? If so, where is the risk highest?
5. Which pumps/valves/gates should be activated to route or reroute the flow and/or create stormwater storage to minimize impact?
6. Where can the stormwater be stored until flooding subsides?
7. What is the likelihood of losing electric power at any given pumping station if the storm hits my city? How will this loss of power affect the stormwater system?
8. How will a loss of power impact the ability to route flows through the conveyance and storage system?
9. What is the risk of flooding for county roads? Which roads will flood first?

10. Where will sewage flow if a lift station fails? If a sewer line breaks? How much sewage has or will spill?
11. Is there a danger of combined sewer overflow in a neighborhood given forecast runoff?
12. When will bridges be closed and when?
13. Estimation of damage, cleanup and restoration costs
14. How will the system react to external stimuli like storm-surge?
15. Which district/area should be evacuated first, and which traffic routes are safe?
16. Is there danger from a “coincidental rainfall event?”
17. Should flood alerts/warnings be issued?
18. How long will it be until the water recedes to pre-event level?
19. What is the effect of upstream discharge to downstream water levels?

The following are longer term questions for design, planning, and research:

1. Which areas are most vulnerable to flooding?
2. Which culverts and channels need to be upsized or replaced?
3. Where can stormwater storage and treatment systems be installed?
4. Which short and long-term measures will improve community resilience and provide maximum benefit?
5. What stormwater/wastewater infrastructure (or other infrastructure like roads or trails) is likely to fail from a future flood?
6. How do flood induced failures affect vulnerable populations?
7. Should we install green infrastructure at location X?
8. What additional safeguards should be put in place to protect people and properties?
9. What are the flood inundation extents for various rainfall frequencies?

Proactive Paola

1. What’s the probability that my town will experience a 50-year flood?
2. Which areas are most vulnerable to flooding?
3. Which short and long-term measures will improve community resilience and provide maximum benefit?
4. How do flood induced failures affect vulnerable populations?
5. Should we install green infrastructure at location X?
6. What would be the impact of installing green infrastructure at location X on risk points Y and Z?
7. Is building/developing a parking lot at location X change the connectivity of impervious surfaces in the city?
8. What will be the impact of building/developing a parking lot at location X on risk point Y if we get 10 inches of rain?
9. Should a hospital/senior living home be built at location X?
10. What additional safeguards should be put in place to protect people and properties?
11. What are the flood inundation extents for various rainfall frequencies?

Manager Michael

1. I see in media reports that the snowpack in the watershed for the river draining past my lab is at record levels. Is my property in danger of flooding?
2. What is the predicted maximum discharge for the upcoming snowmelt flood.
3. What is the maximum discharge that can be handled without impact to my lab?
4. How high will the water get?
5. Do we need to take protective actions to protect the facility?
6. Protective actions I can think of include sandbagging, evacuation, turning off power and utilities, suspending operations and sending employees home. Which of these are necessary?
7. Where can I get sandbags and help sandbagging?
8. Where can I get help with turning off power and utilities?
9. If evacuation and suspending of operations is necessary, when will I know.

Researcher Rita

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2. .
3. .