Rainy Days Newsletter

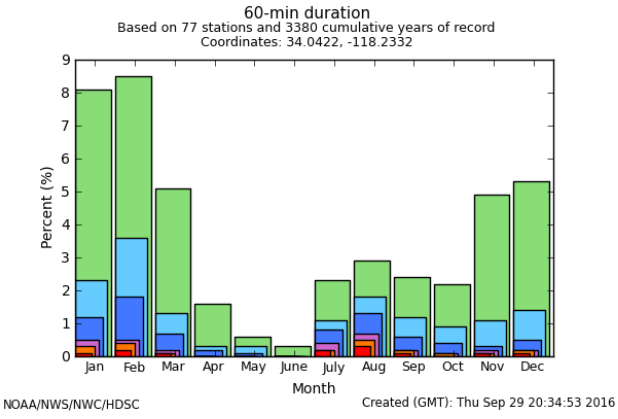
SCS Engineers - Your Protection from the Stormwater Permitting Storm

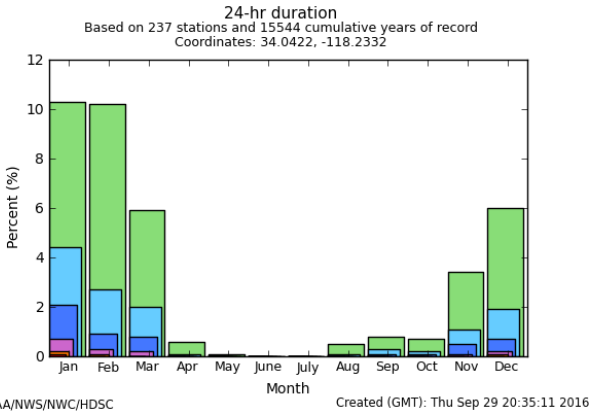
Welcome to the *Rainy Days* - *SCS Engineers' newsletter on everything Stormwater! We have shared some information below about stormwater compliance to help you understand and navigate the sometimes confusing regulatory process – a process that may leave you in a "daze".*

Rainfall in California

In California, it generally rains more frequently in the fall. Rainfall distributions for the largest cities in California show how certain months can have increased frequency and therefore increased stormwater runoff. See 60-minute and 24-hour rainfall duration charts below for the City of Los Angeles. Notice how, contrary to popular opinion, short duration storms do occur in the summer months and longer duration storms tend to be much less frequent in the summer. Statistically speaking, the longer and heavier storms occur during the months of November to March, but short-duration storms occur during the remaining 7 months as well, so being prepared all year long should be your standard operating practice.

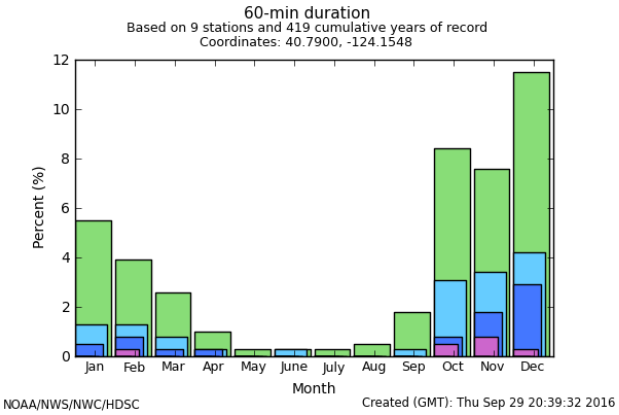
Los Angeles, CA

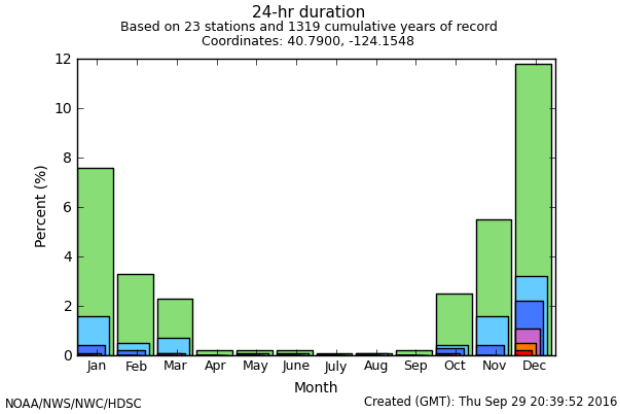




In **Eureka, CA**, the climate is more temperate, therefore frequencies of short duration rainfalls are more evenly spread out, and longer duration events are more concentrated in the winter and late fall months.

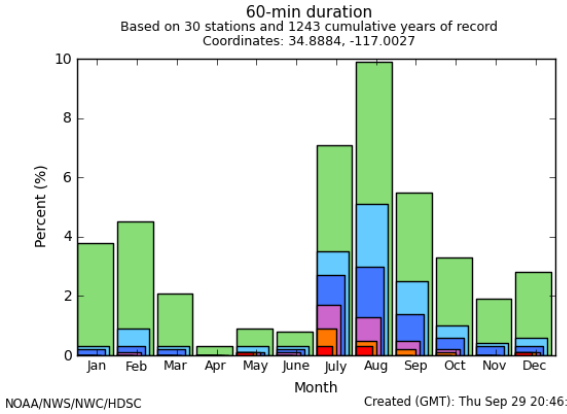
Eureka, CA

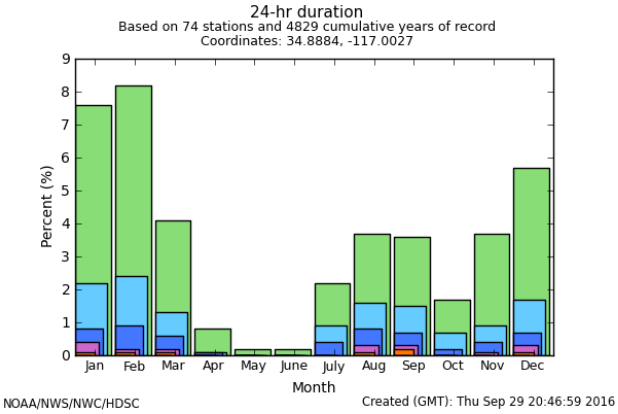




Surprisingly, desert regions have a similar weather pattern. In **Barstow, CA** there is much more exaggeration and the storms are reversed with the larger short-duration storms occurring in the heart of summer.

Barstow, CA





*Note: Charts above are from the NOAA ATLAS 14Point Precipitation Frequency Database: http://hdsc.nws.noaa.gov/hdsc/pfds/.

So what can we learn from this data? Storms can happen at any time of the year, and it is important to always be prepared to take action to comply with stormwater permitting requirements. Following are a few tips that may help you prepare for this year's storm season:

Tip # 1 Be aware that, in addition to the samples required by your National Pollutant Discharge Elimination System ("NPDES" or "Stormwater") permit, you also need to collect quality assurance/quality control (QA/QC) samples. Here are a few things you should know about QA/QC samples:

Rule of Thumb #1. Typically, you need about one duplicate sample for each 10 samples taken. However, since rainfall and runoff discharge times can be infrequent, it is typically good practice to take one duplicate sample during each storm. This will vary based on the number of sample locations at your facility. If you have at least two locations, you can alternate the duplicate sample location from storm to storm.

Rule of Thumb #2. Use proper duplicate sampling techniques. For example, you cannot take the duplicate sample *after* you have taken the qualifying storm sample. Although it may seem like it would be similar (and it probably is), it does not count as a duplicate. To create a better duplicate, follow the following procedure:

1. Make sure you have sterile gloves on hour hands. These can be powder-free disposable nitrile or latex gloves (sold by medical and laboratory suppliers). Do not use powdered gloves.
2. Use a flat surface to place the containers on. Make sure the area is covered so your samples to not get contaminated with falling rainwater.
3. Fill one sample container with your Stormwater sample. Try to take the sample directly from the point of compliance. This usually is best if there is a hydraulic drop.

Photo from EPA's Industrial Stormwater Monitoring and Sampling Guide

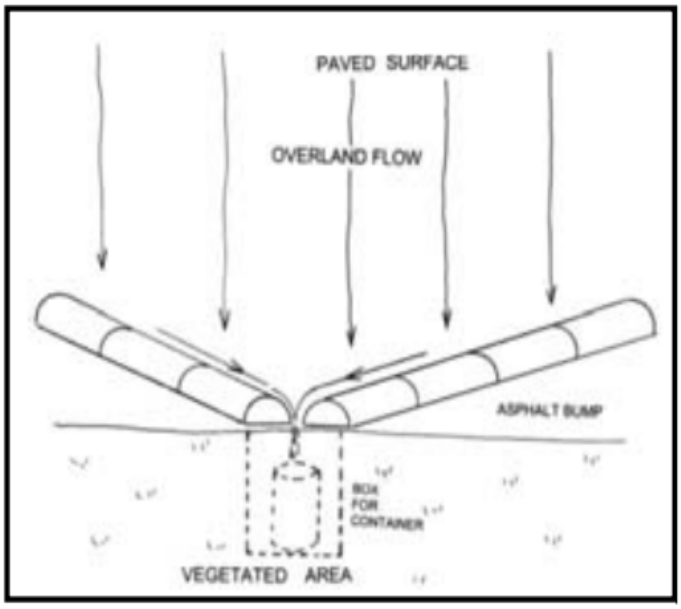
What happens if you cannot sample like the ideal conditions here? You may have to sample "sheet flow" off the ground. Here are a few sheet flow sampling tips on the next page.

#1 Use a lab certified sample scoop as shown below and make sure the lab cleans off the container.

#2 Use a stainless steel or disposable scoop as shown here.

If using a plastic scoop, and sampling for oil and grease, you must submit the scoop to the lab for decontamination, as oils may attach to the plastic container and the lab will "decon" the oils into the sample container for analysis

Or, #3, the preferred option, build a berm using sand bags or you can fill zip lock bags with soil. Create an obstruction in the flow path with a defined overflow path from the obstruction called a weir. Lay down fresh plastic sheeting obtained from the lab or a lab vendor. Collect sample into a sample container or use a plastic bag to collect the water sample. Submit the transfer bag with your sample container to the lab for each sample you take (e.g. one for Oil and Grease, one for TSS, one for metals.



EPA Industrial Stormwater Monitoring and Sampling

4. Fill the container full.
5. If the container does not have any sample preservatives in it, then close it, shake it. After shaking, pour half of the sample into a second container.
6. Then fill a quarter of the first sample container.
7. Then fill the remaining half of the duplicate container.
8. Then fill the last quarter of the first sample container.
9. If the bottle has preservatives in it, then only fill half of the first bottle first, then half of the second, and rotate back and forth with ¼ fill of the first, ½ fill of the second (duplicate), and the last ¼ of the first bottle. No shaking required or pouring between bottles should occur for sample bottles that have preservative in them, as provided by the laboratory.

This procedure will become easier after you have repeated it for a few storm events. For additional assistance on sample collection, please review this video for help. In California, the timeline for sample

collection is 4 hours from start of discharge, not 30 minutes as cited from the video, which mentions the requirements in Minnesota.

Tip # 2 There are several ways to monitor the weather to anticipate storm events so you can be prepared to collect samples when necessary:

1. Pay attention to the forecast. When the chance of rain is greater than 50%, be prepared to collect samples.
2. Monitor the sky for darker clouds and sometimes a drop in barometric pressure. If you see a slight sprinkle outside, take a walk outside as soon as possible to check the grounds. Look at the drainage features on-site: the curbs and gutters (is water flowing?); the pavement surface (does it look wet and are there small ponded areas?); etc. If you do not see these things, then you still have no discharge and, per your permit, your 4-hour sample collection period has not yet started. Water must be flowing off the property before you are required to take a qualifying storm sample. The sample must be taken within 4 hours of initiation, so be sure to check the site again within 4 hours. If you are leaving the site, inform the next shift or person in charge about the time you last checked the site, and document it in your Stormwater Inspection/Rainfall Sample Collection Log.
3. You can collect better information about rainfall on your site by using a recording rain gauge. Rain gauges are relatively inexpensive ($300 to $1000). The more robust route would be to install the kind of gauge used by the USGS. These devices can be hooked up to cell phones, satellites, or radio telemetry that can sync to your company's server or to a website that allows free uploads of rainfall data, such as www.wunderground.com. The data can be stored off-site and used to validate annual reports for your location.
4. Once your on-site rain gauge is synced with your technology, you can receive an email or text message to let you know that it is raining.
5. You can even take it a step further by setting up a bubbler or other instrumentation to verify the timing of discharges from your facility at the discharge location(s). This can also be synced to text messaging or email alerts.
6. When it is raining onsite and a discharge has been verified, do your best to estimate the start time of the discharge and collect your sample within 4 hours.
7. Write down the characteristics of the sample in your notes and/or inspection logs, including: Is it clear or does it have a color? Describe the color. Is there an oil sheen? Is there trash or other identifiable debris? Are there rocks and/or sand and/or fine sediments? Is there an odor? Describe the odor.
8. If the sample is not pristine and clean with no odors, do your due diligence. Do you know what may be causing the materials or odors in the water? If you can, take a few minutes to follow the flow upstream to identify potential sources. Look for things such as degraded pavement surfaces, open material piles, open trash containers, liquid waste containers and their secondary containment structures or berms, and protective covers that may have been damaged in the storm. Do you see areas with erosion and sediment

discharging? Look for wildlife habitats – do you see areas occupied by rodents or birds? Is the odor similar to your sample?

9. If you identify anything that can be fixed easily, such as applying straw wattle sediment controls, sand bags, etc., these can help reduce the quantity of sediments and debris leaving the facility during the storm. If you can make the fixes within your 4-hour window, you can still take a qualifying storm sample that might be cleaner.

We hope that you find these tips to be helpful as you prepare to conduct your routine storm event sampling during the 2016-2017 fall and winter storm season. If you have questions about sampling techniques, how to be prepared for storms, permitting, or obtaining testing supplies contact Cory Jones at cjones@scsengineers.com. Cory Jones, PE, QSD, QISP ToR, ENV SP is SCS Engineers' Southwest Stormwater Manager.