

Using Social Media to Help Manage Water Quality Issues

A Water Quality Surveillance and Response System Application

June 2022

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U.S. EPA, Office of Groundwater and Drinking Water

Water Security Division



Disclaimer

The Water Security Division of the Office of Ground Water and Drinking Water has reviewed and approved this guidance document for publication. This document is intended for drinking water utilities who use social media.

This guidance is new. It does not modify or replace any previous EPA guidance documents. This guidance document is intended for use by public water systems to help manage water quality issues via social media. This document does not impose legally binding requirements on any party. The information in this document is intended solely to recommend or suggest and does not imply any requirements. Neither the U.S. Government nor any of its employees, contractors or their employees make any warranty, expressed or implied, or assumes any legal liability or responsibility for any third party's use of any information, product or process discussed in this document, or represents that its use by such party would not infringe on privately owned rights. Mention of trade names or commercial products does not constitute endorsement or recommendation for use.

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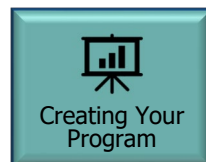
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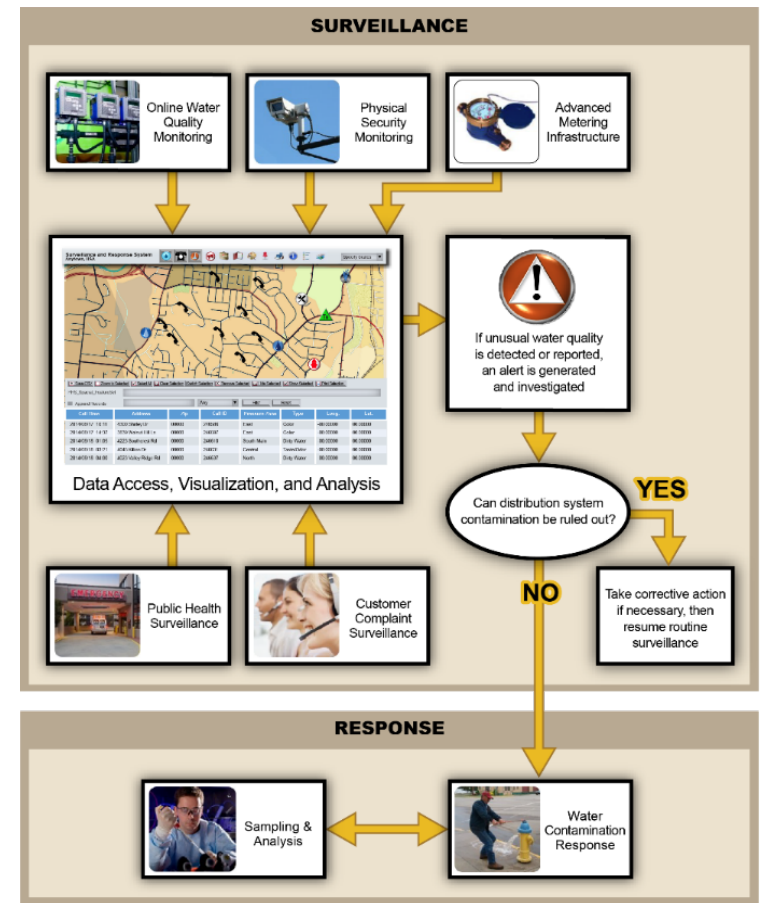
Introduction to Social Media Management for Water Utilities

Social media has become a key feature in our daily life. Many companies and organizations utilize social media as a resource to understand customer experience, manage emergencies, and increase security. Specifically, water utilities can employ social media as an additional communication tool to reach customers, address customer complaints, and help manage water quality issues. Through social listening, which is the process of understanding and analyzing applicable keywords and hashtags, utilities can use customer complaints to quickly address water quality issues.

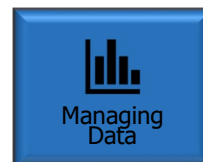
The EPA has developed two guidance documents to assist water utilities in using social media with [Customer Complaint Surveillance \(CCS\)](#).

- Users not familiar with establishing or working in social media programs are encouraged to first review the “Setting up a Social Media Program” document, which explains how to set up a utility social media program. A basic social media program can be used to engage with customers, increase brand recognition on social media, and communicate during a crisis.
- This document builds on the “Setting up a Social Media Program” document and explains how to search and manage social media data. This guidance document will demonstrate how to leverage a basic social media program as a powerful resource to identify water quality issues.

To review the “Setting up a Social Media Program” Guidance Document click the document icon.



Surveillance and Response System Components. Source: EPA’s Designing CCS Guidance Document.





Creating Your Program

Roles & Responsibilities

Process Flow

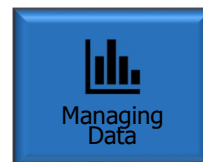
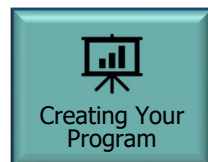
Managing Your Social Media Program

This section reviews how to set up a social media program including roles, responsibilities, and process flows for responding to complaints on social media.

Assigning Social Media Management Roles & Responsibilities

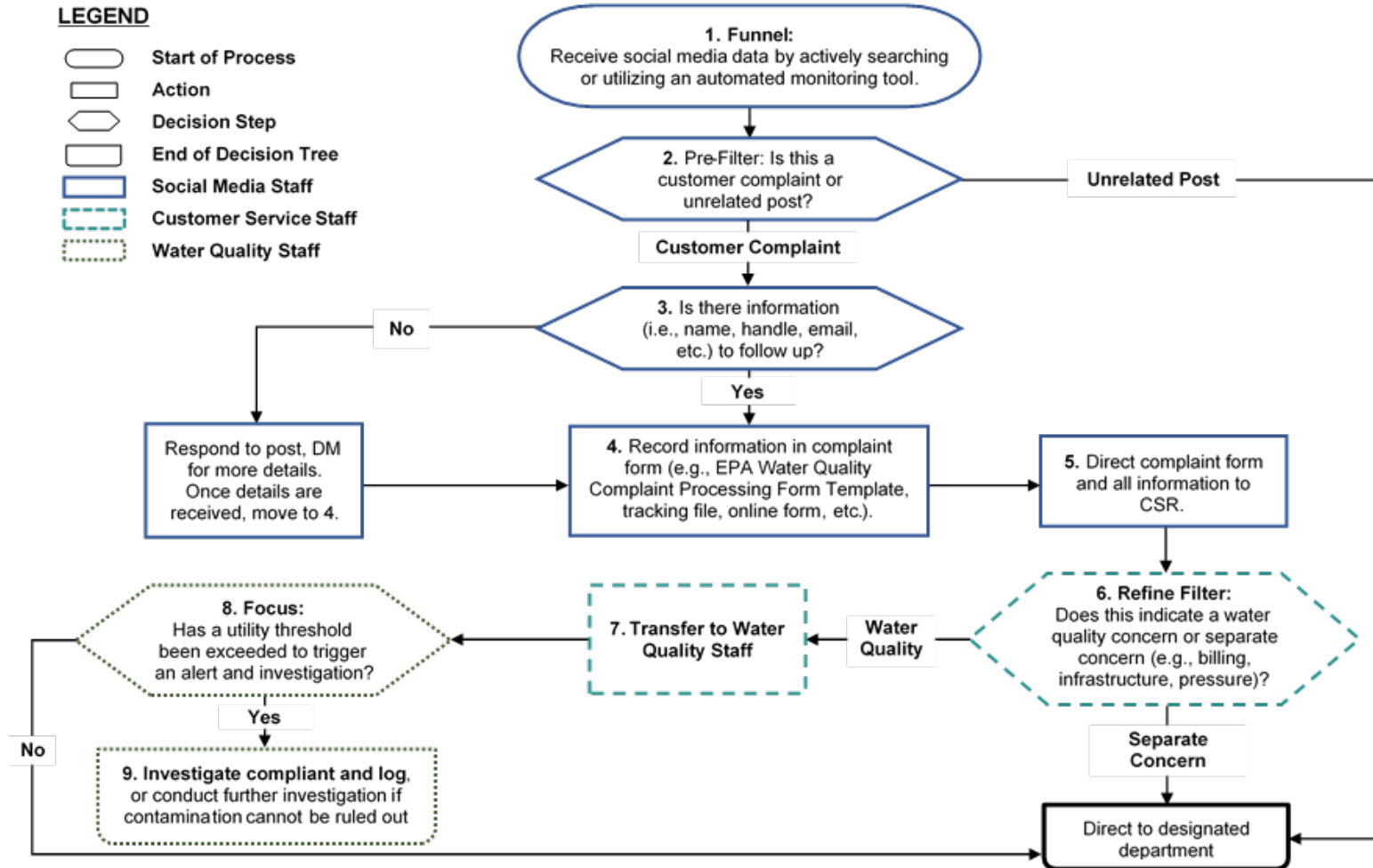
To expand a social media program to a listening program, additional responsibilities need to be assigned. The roles and responsibilities included below build upon the responsibilities for a social media program team in the [“Setting Up a Social Media Program”](#) guidance document. Additional roles and responsibilities are included below:

Team Member Role	Responsibilities	Name and Department	Status
Social Media Team Lead	<input type="checkbox"/> Overall management <input type="checkbox"/> Approves all emergency content pre-post <input type="checkbox"/> Creating a policy and guidelines for social media <input type="checkbox"/> Regularly check accounts to ensure consistent messaging across platforms		<input type="checkbox"/> Full-Time <input type="checkbox"/> Part-Time
Digital Content Lead	<input type="checkbox"/> Develop and curate content for emergency communication posts <input type="checkbox"/> Send content and design to Account Manager for posting		<input type="checkbox"/> Full-Time <input type="checkbox"/> Part-Time
Social Media Listening Data Manager	<input type="checkbox"/> Create and manage social media accounts <input type="checkbox"/> Clear content with Social Media Team Lead and posts approved content <input type="checkbox"/> Respond to all incoming posts <i>or</i> <input type="checkbox"/> Direct the Customer Service Representative (CSR) to respond to complaints <input type="checkbox"/> If utility hashtags are used, search hashtags at least once a day <input type="checkbox"/> If using keyword searches, check keywords at least once a week		<input type="checkbox"/> Full-Time <input type="checkbox"/> Part-Time
Customer Service Representative (CSR)	<input type="checkbox"/> Respond to customer’s complaints when directed by Account Manager <input type="checkbox"/> Collect detailed information from customers regarding water quality complaints during normal business hours <input type="checkbox"/> Advise customers about water quality incidents related to typical distribution system issues (e.g., rusty water due to flushing, chlorine odor due to operations) <input type="checkbox"/> Provide details on specific water quality complaints to the CSR Supervisor		<input type="checkbox"/> Full-Time <input type="checkbox"/> Part-Time
CSR Supervisor	<input type="checkbox"/> Receive and assist in the investigation of alerts with the utility’s Water Quality Surveillance and Response System Manager		<input type="checkbox"/> Full-Time <input type="checkbox"/> Part-Time



Process Flow for Responding to Social Media Complaints

Once staff roles are assigned, use this process flow to understand the origins of water quality complaints detected through social media. This is a systematic process used to determine whether the complaint(s) could be indicative of a possible water contamination incident. A link to the Processing Form Template referred to in Step 4 can be found on page 22 of [EPA's Designing CCS Guidance Document](#), which utilizes a "Funnel, Filter, and Focus" methodology for detecting water quality issues through customer feedback (EPA, 2017).



Searching & Managing

Actively Searching

Management Tools

Search Strings

Keywords

Searching & Managing Social Media for Water Quality Complaints

This section includes information about searching and managing social media for water quality complaints. Searching is an active process built around keywords or hashtags. Listening is a passive process that relies on automated social media listening tools to trigger alerts.

Actively Searching Social Media Complaints

The utility can actively locate customer complaints by regularly checking their social media account and searching for their hashtags. Customers may submit complaints on social media using one or a combination of these methods:

- **Tag:** Directly tagging the utility's handle in a public social media post.
- **Direct Message:** Submitting a private direct message to the utility.
- **Hashtag:** Using a utility hashtag (e.g., #WaterQualityIssue) in their public post.

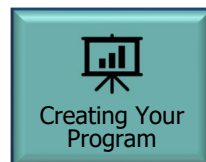
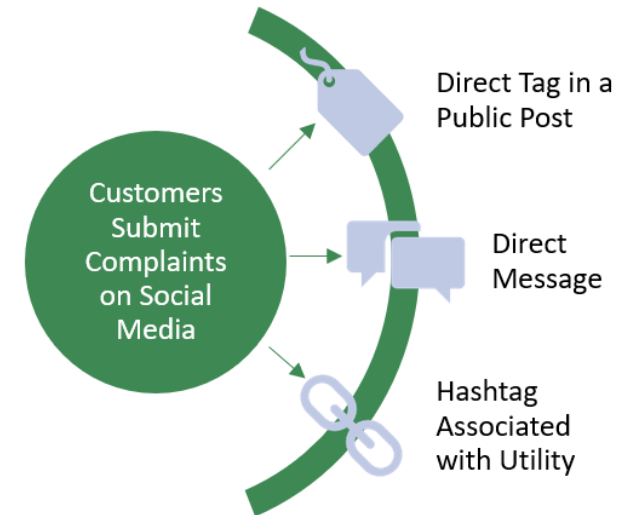
If the customer chooses to contact the utility by tagging or direct messaging them, the utility will automatically be informed via the platform's notifications. If the customer uses a utility-related hashtag but does not tag the utility, the utility will not automatically receive a notification. Additionally, to receive direct messages, certain privacy settings may need to be enabled. Refer to the platform-specific privacy settings for more information.

See the Twitter conversation below between a customer and utility for an example of tagging and hashtag use to initiate an exchange via direct messages.



John Smith
@JohnSmith
[@CityWaterUtility](#) My water is cloudy. Please DM me for more details. [#WaterQualityIssue](#)
2:41 PM Aug, 20, 2020 [Twitter for Android](#)

City Water Utility
@CityWaterUtility
[@JohnSmith](#) Thanks for letting us know. We will DM you for details.
2:48 PM Aug, 20, 2020 [Twitter](#)



Creating Your Program



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Management Tools to Capture Complaints

Some larger utilities with high engagement use social media management tools to increase efficiency, response times, and searching capabilities. Depending on your utility’s size, engagement, and budget, consider if a management tool is necessary and if so, which tool is best. Utilities that use these optional tools, typically spend \$500 - \$5,000 yearly on services (WRF, 2017).

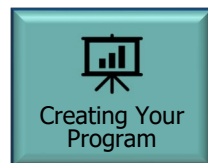
There are many social media management tools that are beneficial to track engagement, analyze messaging, and evaluate brand recognition. These tools have various capabilities such as:

- Analytics to create reports on social media engagement and followers;
- Archiving features to record and organize past posts and interactions with customers;
- Manage and automate the posting of pre-written social media content at predetermined times;
- Data visualization to create visually appealing graphics of social media usage; and
- Listening algorithms to monitor posts for keywords.

Some tools perform all or some of these listed functions, while others are specialized. Below is a summary of some of the more commonly used tools. Note: New tools are routinely introduced.

Social Media Management Tool	Monitors Multiple Social Media Platforms	Keyword Searching Available	Analytics Available	Archiving Available	Listening Available
Subscription Services (e.g., Hootsuite, Brandwatch, Mention, etc.) (Paid)	Yes.	Yes. (Number of keywords varies. May search by language, source, or tag).	Creates usage reports.	Yes. Stores social media posts.	Listening queries. Set up email alerts for keyword searches and queries.
Tweetdeck (Free)	No. Twitter only.	Yes. (Search by keyword, location, and date).	Manually save tweets in sections called “collections”.	No method for exporting posts to analyze.	Automatically organizes all tweets that mention your handle in one collection.
Google Analytics (Free)	Tracks website traffic.	N/A	Tracking reports.	N/A	N/A

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- Actively Searching
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Search Strings and Keywords

Since customers do not always know to direct complaints to the utility, they may post about their drinking water quality on social media without tagging or notifying the utility. By using keyword searches and management tools, you may locate unreported water quality complaints, therefore, increasing your opportunity to detect issues sooner.

Many social media management tools allow users to search for posts using Boolean keyword search strings such as 'OR', 'AND', and 'AND NOT'. These strings are used in keyword searches where Boolean operators are utilized to allow users to design advanced queries. These searches are particularly helpful when searching for a keyword that is used in many different contexts, such as "water." By searching for posts that contain 'water' 'AND NOT' 'swimming', utilities can filter out search results that are not useful. By combining searches for drinking water with keywords for specific water quality issues, utilities may be able to identify likely causes of water issues without the customer ever reporting them.

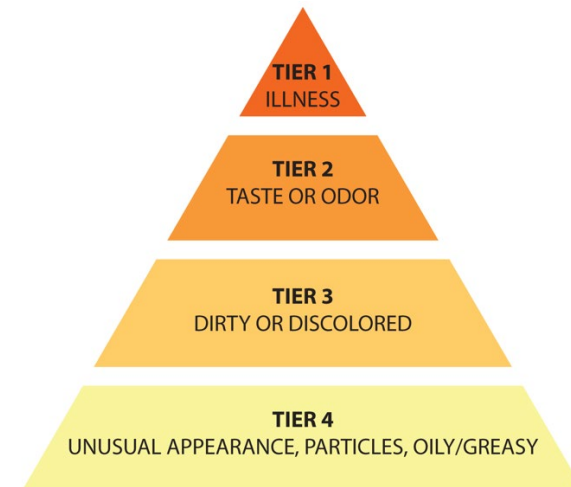
Geographical location data (i.e., geotagging) are used on most social media platforms and allows users to denote the location of the content of a given post. Utilities can use geotagging to locate water quality complaints more accurately. Additionally, posts that are not geotagged may still include exportable geographic location data based on the reported location of a user's profile.

The table on the next page summarizes useful keywords for each of the four complaint category tiers of [EPA's Designing CCS Guidance Document](#) (EPA, 2017). See Figure 2.

Some sample search strings are:

- ([Utility name] OR [Utility abbreviation] OR ([City name] AND Water)) AND ((Problem OR Issue) OR (Bad OR Nasty OR Gross))
- (Tap OR Water) AND ("Tastes like" OR "Smells like")
- (Tap AND Water) AND (Dirty OR Discolored OR Color OR Brown OR Yellow)
- ((Drink AND Water) AND (Sick OR Ill)) AND (Lake OR River OR Stream OR Well OR Intake OR Reservoir OR Spill OR Accident)
- ((Drink AND Water) AND (Sick OR Ill)) AND NOT (Pool OR Drain OR Sewer)
- ([Utility name] OR [Utility abbreviation] OR ([City name] AND Water)) AND ((Problem OR Issue) OR (Bill OR Pressure OR Leak OR Pipe OR Break))

Utilities can create their own search strings using these samples and relevant keywords from the table on the next page. Utilities can then search these using the social media platform's advanced search function or they can use a management tool to search for unreported water quality issues.



Example Customer Complaint Tier Chart. Source: EPA's Designing CCS Guidance Document.

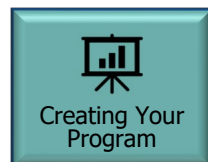
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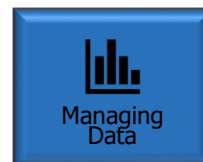
Keywords



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Keyword Search Table

This table shows a list of keywords which can be used for social media management and customer complaint surveillance. The keywords in the tier list were chosen based on EPA guidance and research, and a customer complaint surveillance literature review (Pacific Northwest Section AWWA Water Quality Management Committee, 1998; EPA, 2017; Whelton et al., 2017).

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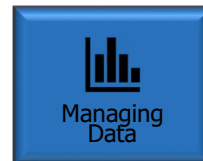
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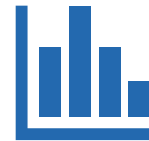
Keywords

Words to Search For – e.g., using ‘OR’, ‘AND’					
General Terms					
Drinking water	[Abbreviation of utility name]	Cannot/can’t drink	Pipe	Do not/don’t drink	Bad
Drink/drinking	[Name of utility]	[City] + water	Tap	Gross	Nasty
Water		Problem	Issue	Undrinkable	Wrong
Tier 1 – Illness					
Sick	Vomit/vomiting	Upset stomach	Sickening	Made (as in “made me sick”)	Diarrhea
Ill	Throw up	Puke			Nauseous/nausea
Tier 2 – Taste or Odor					
Tastes/smells like	Earthy	Acidic	Salty	Chalky	Fishy
Tastes/smells similar	Moldy	Vinegar	Swampy	Tingling	Sour
Tastes/smells bad	Rotten	Sickening	Petroleum	Rubbery	Bitter
Rancid	Grassy	Stale	Plastic	Blood	Chemical
Musty	Soil	Oily	Rusty	Sulfur	Solvent
Fruity	Metallic	Sweet	Moth balls	Herbal	Floral
Orange	Ether	Rotten eggs	Chlorine	Gasoline	Septic
Tier 3 – Dirty or Discolored					
Dirty	Not clear/unclear	Muddy	Dark	Yellow, yellowish	Grey/gray,
Discolored	Colored	Red, reddish	Black	Brown, brownish	Greyish/grayish
Tier 4 – Unusual Appearance, Particles, Oily/Greasy					
Particles	Specks	Oil/oily	Opaque	Bubbles/bubbly	Looks/Appears...
Particulate matter	Cloudy	Grease/greasy	Rust/rusty	Fizzes/fizzy	- weird/odd
Dirt/dirty	Floater/floating	Milky	Silt	Bacteria	- different/wrong
					- unusual/not right
Words to Exclude – e.g., using ‘AND NOT’					
Lake	Pool	Pond	Swimming	River	Sick (slang usage)



Social Media Data Management and Analysis

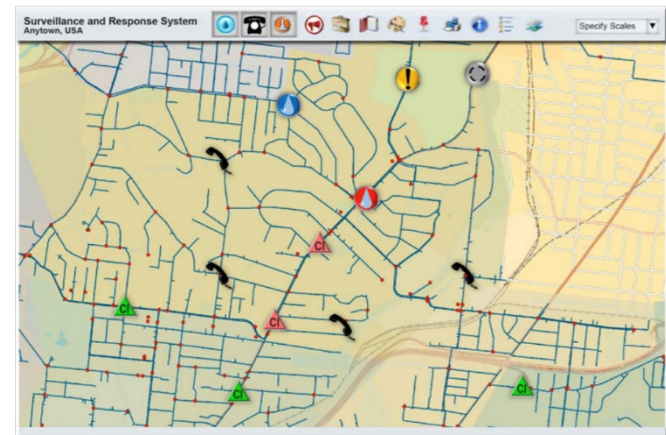
This section discusses strategies for managing social media data including recording complaints and creating alerts and thresholds.



Recording Social Media Complaints

It is useful for utilities to record social media complaints in a consistent manner to reduce confusion and duplication of work as well as increase the ability to recognize water quality issues. Here are some considerations when recording social media complaints:

- **Determine frequency:** Depending on the volume of the utility’s incoming posts, a utility may need to document complaints at varying rates (e.g., when there is a higher volume of incoming social media posts, documentation should occur more frequently).
- **Pick a process or tool:** To record complaints, filling out the CCS Water Quality Complaint Processing Form in Section 3.2.4 of [EPA’s Designing CCS Document](#) or the utility’s equivalent customer complaint tracking process is recommended (EPA, 2017). Additionally, there are many customer complaint systems that can help manage customer complaints as well as provide tools for customers to easily submit complaints. Many products have paid and free versions depending on your utilities budget.
- **Record information consistently:** Be sure to record the customer’s social media account information (e.g., name, handle, and email address if the information is public on the user’s profile) and indicate the social media platform used. This is useful in case follow-up communication is needed and to track the most utilized social media sites to inform management.
- **Define the complaint type and location:** Complaints received by social media will need to be categorized so the correct utility personnel respond to the post, e.g., billing related, water quality, etc. All social media data is automatically date and time stamped; however, geolocation capability is dependent on the user’s settings. If the customer’s social media data does not contain spatial information because the customer does not enable the geolocation capabilities, then maps, spatial statistical models, and customer relation management systems with application programming interfaces cannot be used.

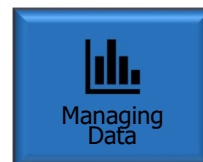
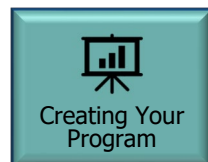


Interface showing geolocation of customer complaints.

Managing Data

Recording

Alerts & Thresholds



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Creating Alert Thresholds for Social Media Complaints

It is useful to establish a baseline of daily and weekly social media posts so that when the baseline is exceeded, an alert will notify the utility of a potential excess in customer complaints, which may indicate a larger water quality issue. The threshold for social media complaints can be reevaluated on a periodic basis as the number of followers and methods of outreach change.

Some social media management tools will establish thresholds and alerts based on historic social media usage and trends. Additionally, review Section 4.2 of [EPA's Designing CCS Document](#) to learn more about alert generation and establishing thresholds for water quality complaints (EPA, 2017). It contains useful tools such as, [the EPA's Alarm Estimation Tool \(AET\)](#) and [EPA's Threshold Analysis Tool \(TAT\)](#) (EPA, 2017).

Thresholds may be dependent on each utility's staffing capabilities, number of connections, followers, total customers, and percentage of customers that use social media. Furthermore, social media complaints are often treated as Tier 1 complaints – therefore having a threshold of 1 – because of brand and image concerns.

Advisory Alerts

DC Water was able to respond quickly to a water pressure issue with the help of customer's notification on Twitter.

In 2018, the water utility DC Water, had low water pressure that started at 8:30 pm on July 12 (DC Water, 2018). Customers quickly took to Twitter to notify DC Water of the issue; there were 55 tweets directed at DC Water before a Boil Water Advisory was publicly released, 10 of which were posted in the first 30 mins. DC Water followed up on reports of low pressure at 9:04 pm and identified and fixed the issue by 9:40 pm.

Setting an alert allows the utility to react quickly to customer complaints and address water quality issues. During July 2018, the average number of tweets posted to DC Water's social media accounts were approximately 18 per day, which could be used as a baseline to ensure DC Water is notified when customers reach out via social media in unusually high quantities. This serves as an example of how setting an alert threshold for social media can streamline investigation of customer complaints.



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Resources



AWWA, Pacific Northwest Section, Water Quality Management Committee. (1998). *Summary of Customer Complaint Causes/Responses*.

DC Water. (2018). *Boil Water Advisory Report*. <https://dcwater.com/whats-going-on/news/dc-water-releases-comprehensive-report-pressure-drop-and-boil-water-advisory>

EPA. (2017). *Designing Customer Complaint Surveillance*. https://www.epa.gov/sites/production/files/2018-02/documents/customer_complaint_surveillance_design_guidance.pdf

Water Research Foundation (WRF). (2017). *Social Media for Water Utilities*. Project #4638.

Whelton, A., Dietrich, A., Gallagher, D., Roberson, J., (2017). *Using Customer Feedback for Improved Water Quality and Infrastructure Monitoring*.

