

Harmonized Heat Warning and Information System for Ontario, 2023

Ministry of Health
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Preamble

Reference Documents are program or topic-specific documents that provide information and best practices relevant to implementing the Ontario Public Health Standards: Requirements for Programs, Services, and Accountability (Standards), Protocols and Guidelines. Reference Documents are not enforceable; the aim of Reference Documents is to provide professional staff employed by local boards of health support in operationalizing and implementing requirements outlined in the Standards, Protocols and Guidelines.

Purpose

This document outlines a Harmonized Heat Warning and Information System (HWIS) for dealing with heat events. The aspects of this HWIS include:

- Governance: roles, responsibilities, and decision-making structures
- Triggers for the issuing of various heat warning to the public health units (PHUs) from a central source, and mechanisms for disseminating these warnings
- Definitions of warnings, along with suggested core activities
- Communications messaging to support the various warning levels
- Planning guidance to support PHUs and local partners in their heat response planning

This document is intended to support planning for boards of health and PHUs in Ontario. Other levels of government and potential partners may also choose to use the guidance contained in this document.

It is recognized that there is a wide variation in local response plans. Essential activities under the HWIS are focused on notification and communication processes. The HWIS will enable PHUs to increase consistency in response to heat events and to better protect residents, vulnerable community members and visitors.

Roles and Responsibilities

The [Ontario Public Health Standards](#) (OPHS) establish the minimum requirements for fundamental public health programs and services to be delivered by Ontario's 34 boards of health, which include assessment and surveillance, health promotion, health protection, and disease and injury prevention. The OPHS are published by the Minister of Health and Long-Term Care, pursuant to Section 7 of the [Health Protection and Promotion Act, R.S.O. 1990, c. H.7](#).

Under the [Health Hazard Response Protocol, 2019](#), public health units are required to prevent and reduce the burden of illness from health hazards in the physical environment, including extreme weather and extreme temperatures.

Public Health Units (PHUs)

Health unit actions to mitigate heat health impacts may include alerting and response activities. The response activities that the PHU itself is directly responsible may vary due to the variability in municipal hot weather response plans. PHUs may also have varying responsibilities in working with municipalities and other community partners to ensure that other aspects of the response plans are delivered. PHUs should ensure that roles and responsibilities are clear, and that planning links are well established prior to a heat event. As part of the Ontario HWIS, PHUs can expect to:

- Receive the heat warnings provided by Environment and Climate Change Canada (ECCC)
- Communicate information based on the heat warnings and appropriate health protective measures
- Review any existing guidance regarding local partnerships and planning activities, and share with partners for their consideration in local heat response and/or emergency management plans
- Conduct surveillance of local heat related health impacts
- Participate in evaluation activities

Local Municipalities and Community Partners

Municipalities and community agencies will be key partners for PHUs. Precise roles will vary. It is recommended that PHUs include appropriate local partners in the review of the response planning guidance included in this document. While local response to heat will continue to be based largely on the varied existing local heat response plans, there may be opportunities for plan improvement or enhanced coordination in the areas of:

- Local partner notification processes
- Public communications and support to public health heat education opportunities
- Making cooling spaces and hydration accessible to the public
- Working to address the needs of vulnerable populations
- Responding to impacts on municipally-delivered health services such as Emergency Medical Services or Long-Term Care
- Responding to impacts on critical infrastructure such as power supply
- Occupational health and safety for their own workers in hot weather
- Potential activation of local Emergency Operations Centres, and activation of other local emergency response plans/protocols as required.

The municipalities' roles may involve a range of various departments/divisions, ranging from recreation to public works to social services, as well as multiple community partners, from the Red Cross and utility companies to landlords, faith-based organizations, and smaller local service organizations.

Ministry of Health (MOH)

The Ministry of Health is responsible for setting standards for public health units and monitoring PHU activity. The ministry also provides provincial emergency management leadership in the areas of human health, disease and epidemics, and health services during an emergency:

- The Office of the Chief Medical Officer Health, Public Health (OCMOHPH) to provide ongoing PHU advice in planning and evaluation activities.

- While heat response is often handled within the mechanisms of local level plans, in the event of a widespread, severe, or prolonged heat emergency, or where impact on the health care system is significant (e.g., widespread loss of power) additional provincial emergency management coordination may be required.

Environment and Climate Change Canada (ECCC)

- Weather surveillance, forecasting, and issuance of:
 - Public weather forecasts and early notification products
 - Ontario Vigilance Bulletin (OVB)
 - Public Weather Forecasts
 - Metnotes
 - Other potential products may be available
 - Public Weather Alerts related to Heat including:
 - Heat Warnings
 - Special Weather Statements (SWS) related to heat

Health Canada

- Providing evidence-based heat health information
- Providing guidance documents and best practices

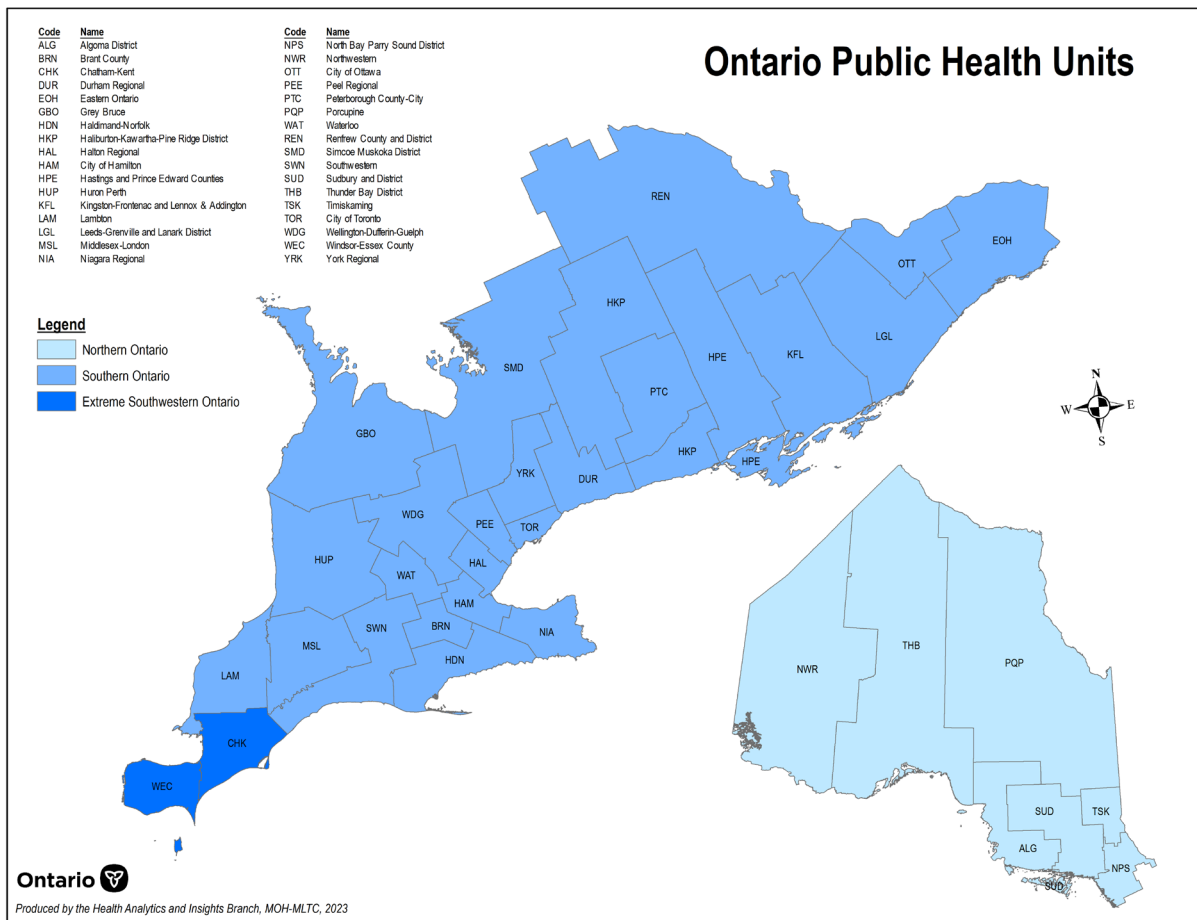
Heat Warning Triggers

With support from Health Canada, Public Health Ontario (PHO) conducted an epidemiological study¹ to better understand the health impacts of extreme heat in Ontario and to support PHUs in implementing a harmonized heat warning and information system that is based on health evidence and representative of the local climate of each PHU. Health-related criteria for the Ontario heat warnings have been

¹ Henderson, D., Aubin, L., Behan, K. *et al.* Developing a harmonized heat warning and information system for Ontario: a case study in collaboration. *Can J Public Health* **111**, 426–432 (2020). <https://doi.org/10.17269/s41997-020-00337-y>

developed based on the relationship between mortality, air temperature or humidex, along with other key factors such as air pollution, climate, and population characteristics. These triggers have been designated across three regions as depicted in Figure 1.

Figure 1: Map of Ontario Heat Regions



Criteria to establish heat health triggers have been developed using results from the epidemiological study conducted by PHO and considering best practices and lessons learned from other Canadian communities. Heat warning criteria have been developed based on intensity and duration of a heat event. All warning levels are based on forecasted conditions as depicted in Table 1.

Table 1: Heat Warning Regions and Associated Triggers (Region, Intensity and Duration)

Heat Warning Region	Condition	Duration
Extreme Southwestern Ontario	*Tmax ≥ 31°C and Tmin ≥ 21°C OR Humidex ≥ 42	2+ days
Southern Ontario	Tmax ≥ 31°C and Tmin ≥ 20°C OR Humidex ≥ 40	2+ days
Northern Ontario	Tmax ≥ 29°C and Tmin ≥ 18°C OR Humidex ≥ 36	2+ days

* Tmax represents maximum daily temperature or daytime High.

Tmin represents minimum nighttime temperature, overnight Low.

Day 1	Night 1	Day 2	Night 2	Day 3 + Night 3+
Tmax met	Tmin met	Tmax met	Tmin met	Tmax met Tmin met
ECCC Heat Warning			ECCC Heat Warning PHU Extended Heat Warning	

Early Notification – Ontario Vigilance Bulletin

Before issuing a public-facing Heat Warning and within the limits of predictability, ECCC makes every effort to capture potential heat events in their significant weather outlook email to its health sector and emergency management partner distribution list once forecast guidance is certain enough to warrant elevated likelihood of a heat event. This product, called the Ontario Vigilance Bulletin (OVB) is sent as a PDF via e-mail 7 days a week by 4PM ET by the Ontario Storm Prediction Centre. The OVB will communicate expected conditions, coverage, and expected duration as is possible with available forecast guidance.

PHUs may choose to communicate this early notification to their key partners or wait for the official ECCC warning. PHUs can forward the OVB to their key partners directly or direct their key partners to sign up for the OVB. If PHUs have non-public partners involved in the provision of their heat program, they are encouraged to contact ECCC regarding the distribution of the OVB.

Early Notification – ECAAlertMe

ECCC's Warning Preparedness Meteorologists and Ontario Storm Prediction Centre operational forecasters are supporting early mobilization of public health units by notifying them in advance (up to one hour) of issuing a Heat Warning through ECAAlertMe. This allows for public health units to enhance weather monitoring, intervene with those most vulnerable and to get prepared for the potential of ECCC issuing a Heat Warning. ECCC will provide an Early Notification (EN) to PHUs that threshold conditions are predicted to be exceeded. These advance EN alerts are available via the ECAAlertMe system.

This prototype interface allows public partners to sign up for e-mail alerts for any alert message types and forecast regions that the Meteorological Service of Canada (MSC) forecasts. PHU and public partners involved in heat should indicate that they are part of the broader health sector to enable them to receive the one-hour advance EN that precedes a Heat Warning from ECCC. This is a self-managed subscription service, but additional instructions to support registering an account and setting up alerts are available upon request.

PHUs may sign up for an ECAAlertMe account at:
https://ecalertme.weather.gc.ca/home_en.php.

Warning Process

When conditions are likely to meet two days or more of warning criteria, then ECCC will issue a **Heat Warning**. To determine when the warning should be issued, forecasters will assess the certainty of experiencing two consecutive days of weather that meets the set criteria for humidex and temperature (daytime highs and nighttime lows). If either temperature or humidex conditions are expected to be met, a Heat Warning will be issued. ECCC will use criteria which vary across the province for the three regions as identified in Figure 1.

In ideal circumstances, ECCC will issue Heat Warnings 18-24 hours in advance of heat conditions being met publicly via the WeatherCAN app and the [ECCC Weather Alerts webpage](#). Sometimes, the forecast is inconclusive or has a high degree of variability; this may result in delayed notification or delayed declaration of a heat warning referred to as a 'short-fuse' Heat Warning. An EN before public issuance of the Heat Warning can still be expected.

Summary of PHU activities based on ECCC notifications:

- **Early Notification** – PHUs activate notifications to key partners
- **Heat Warning** – PHUs notify key partners and activate communications activities, e.g. media activities, to share information with the public about risks and health protective measures, based on ECCC's Heat Warning
- **Extended Heat Warning** – (ECCC notification that heat warning is continuing beyond 2 days) – within the context of local plans, PHUs communicate the Extended Heat Warning message and work with municipal and community partners to implement response activities.

Some modification to existing heat response plans may be required, and local PHUs may need to issue additional media communications. The decision to operationalize additional response plans and/or media communications remains with local Medical Officers of Health.

The chart below identifies the key steps involved in the heat warning process. These steps are **not necessarily** sequential. For example, the notification may be initiated at the Heat Warning stage, or the event could be de-escalated, without an Extended Heat Warning being called.

Figure 2: Heat Warning Notification and Warning Process from ECCC to PHUs and Community Partners

Monitoring	Early Notification	Heat Warning	Extended Heat Warning	De-Escalation
<p>ECCC monitors weather forecast for potential of reaching warning criteria</p> <p>PHUs monitor for any alerts from ECCC</p>	<p>ECCC advises PHU that conditions/criteria are forecast to be met in advance of issuing a Heat Warning</p> <p>Warning is issued publicly 18-24 hours in advance of the criteria being achieved</p>	<p>ECCC advises PHU that conditions/criteria have been met.</p> <p>PHU gives a heads-up to municipalities/partners that conditions have been met and to prepare</p> <p>PHU notifies media of Heat Warning as appropriate (e.g., sharing health protective messaging with the public)</p>	<p>Continued if forecast conditions persist as advised in previous notification to PHU</p> <p>PHU notifies and works with municipalities and partners within the context of local plans to implement response activities</p>	<p>ECCC issues public notification that heat warning is ending as conditions are no longer in effect</p> <p>PHU notifies municipalities/partners and may decide on additional notifications to media as required</p>

Extended Heat Warnings

ECCC's Heat Warning that extends 3+ days would constitute an **Extended Heat Warning** at the local PHU level. While the ECCC terminology for a prolonged event will not change (i.e., Heat Warning), PHUs are strongly encouraged to use the term Extended Heat Warning, when communicating information about a heat event meeting the heat warning criteria that extends beyond 2 days. Refer to the Health Canada's Heat Health Messaging on page 12.

While Extended Heat Warnings are based on forecast conditions, PHUs are strongly encouraged to stage the escalation from Heat Warning to an Extended Heat Warning.

For example, if a 3-day heat event is forecasted, the PHU would notify partners and/or issue a heat warning on the day prior to the Heat Warning conditions being met (when ECCC issues heat warning). If on Day 2 of the heat warning, ECCC indicates the heat warning will continue into a third day, the PHU would upgrade to an Extended Heat Warning for the following day/s (and/or issue an extended heat warning). An example of the escalation process is depicted in Table 2. Extended Heat Warnings are not issued and/or disseminated by ECCC.

A PHU may consider additional local factors in the escalation to an extended heat warning, for example residents may not be acclimatized to extreme heat early in the season, power outages that may impact the ability of vulnerable populations to cool down, and surveillance of hospital visits attributable to extreme heat.

Table 2: Example of Public Health Unit Action in Response to Heat Trigger Escalation

Action	Day -1	Day 0	Day 1	Day 2	Day 3	Day 4	Day 5
ECCC	Heat-related areas of concern are being displayed in the Ontario Vigilance Bulletin for 3+ days	Heat Warning issued today for conditions beginning tomorrow (PHUs receive 1 hour advance notice before public warning issued)	Heat Warning expected to continue for at least 3 days	Heat Warning expected to continue 2 more days	Heat Warning continued	Heat Warning will not be in effect as of tomorrow	Heat Warning ended
PHUs	May notify partners	Notify partners/ media re: Heat Warning criteria met; some PHUs may issue heat warning	Heat Warning in effect - May notify partners that conditions expected to continue at least 3 days	Heat Warning in effect - Notify partners that Heat Warning will continue /Extended Heat Warning criteria have been met; some PHUs may issue extended heat warning	Extended Heat Warning in effect	Extended Heat Warning in effect but with De-escalation: Notify partners that heat conditions are not expected to continue to day 5	May notify media that heat conditions are no longer in effect; or Extended Heat Warning has ended

While all PHUs will notify partners and media, some PHUs may choose to use language conveying that the PHU/local Medical Officers of Health (MOHs) has issued a heat warning (based on ECCC heat warning), and others may choose to simply relay ECCC's heat warning. It is important to note, however, that these notifications and issuances be based on ECCC's criteria for heat warnings.

As noted above, PHUs may consider additional factors when escalating to an Extended Heat Warning. PHUs may need to issue additional media communications, however, the decision for how these processes will be operationalized, remains with the individual local MOHs.

Other ECCC Public Facing Messaging

A **Special Weather Statement** will be issued at the discretion of the MSC with the first forecast of a heat event in the season up until the Canada Day weekend, when conditions do not meet heat warning criteria but could pose health risks, particularly to those vulnerable to the heat who are not yet acclimatized to the warmer weather. The MSC shall use single day criteria (for maximum temperature and/or maximum humidex) for the Special Weather Statement as guidance for issuance for affected forecast regions. Ideally, the Statement will be geographically relevant for entire Heat Regions. The MSC also maintains discretion for issuing Special Weather Statements for other one day events for the season. The MSC will endeavor to provide Early Notification emails one hour in advance of the Special Weather Statement. In all cases, the heat warning will trump the issuance of a Special Weather Statement for heat.

On the ECCC WeatherCAN app, there is a newer product available on Location pages called a **Metnote**. Metnotes are an opportunity for forecasters to communicate potentially impactful weather or weather of note that does not meet warning criteria to the public. Metnotes may occasionally reference temperatures or speak to abnormal temperature trends.

Communications and Messaging

The need for standardized heat health messaging has been identified as a key component of a harmonized HWIS. Some PHUs and municipalities disseminate heat-health communications to residents while some regions in Ontario do not. Without a consistent approach, residents who are exposed to messages from neighbouring jurisdictions often struggle to understand warning terminology and triggers. Consistency is important in both the types of heat-health messaging communicated, and the terminology used in communication.

As noted in the Heat Warning Section, while PHUs are encouraged to incorporate ECCC's "heat warning" terminology, some PHUs may choose to use language conveying that the PHU/local MOHs have issued a heat warning (based on ECCC heat warning), while others may choose to simply relay ECCC's heat warning.

Timing for dissemination of heat-health messages may also be improved by raising pre-season and pre-event awareness across the province, thereby contributing to better heat-health knowledge and preparedness of the public before the onset of a heat event. In addition, post-event communications are often omitted from heat-health communication plans in Ontario, revealing a missed window of opportunity for building awareness as well as delivery of messages to those who are still coping with post-event stress.

Municipalities and PHUs target similar heat-vulnerable populations. If effectively coordinated, heat-health communication campaigns can be strengthened through broad dissemination. Use of consistent and standardized messaging is integral.

Health Canada's [*Communicating the Health Risks of Extreme Heat Events: Toolkit for Public Health and Emergency Management Officials \(Toolkit\)*](#) identified scientifically sound heat-health messages for public communication. PHUs should use this messaging in their heat-health communications.

Health Canada's Heat-Health Messages

Message 1: Heat illnesses are preventable.

Message 2: While extreme heat can put everyone at risk from heat illnesses, health risks are greatest for:

- older adults;
- infants and young children;
- people with chronic illnesses, such as breathing difficulties, heart conditions, or psychiatric illnesses;
- pregnant women;
- people who work in the heat;
- people who exercise in the heat;
- people experiencing homelessness; and
- low-income earners.

Message 3: If you are taking medication or have a health condition, ask your doctor or pharmacist if it increases your health risk in the heat and follow their recommendations.

Message 4: Heat illnesses include heat stroke, heat exhaustion, heat fainting, heat edema (swelling of hands, feet and ankles), heat rash and heat cramps (muscle cramps). Watch for symptoms of heat illness, which include:

- dizziness or fainting;
- nausea or vomiting;
- headache;
- rapid breathing and heartbeat;
- extreme thirst; and
- decreased urination with unusually dark yellow urine.

If you experience any of these symptoms during extreme heat, immediately move to a cool place and drink liquids. Water is best.

Message 5: Heat stroke is a medical emergency! Call 911 or your local emergency number immediately if you are caring for someone, such as a neighbour, who has a high body temperature and is either unconscious, confused or has stopped sweating. While waiting for help - cool the person right away by:

- moving them to a cool place, if you can;
- applying cold water to large areas of the skin or clothing; and
- fanning the person as much as possible.

Message 6: Frequently visit neighbours, friends and older family members, especially those who are chronically ill, to make sure that they are cool and hydrated.

Message 7: Drink plenty of cool liquids, especially water, before you feel thirsty to decrease your risk of dehydration. Thirst is not a good indicator of dehydration.

Message 8: Reschedule or plan outdoor activities during cooler parts of the day.

Message 9: Wear loose-fitting, light-coloured clothing made of breathable fabric.

Message 10: Never leave people or pets in your care inside a parked vehicle or in direct sunlight.

Message 11: Take a break from the heat by spending a few hours in a cool place. It could be a tree-shaded area, swimming facility or an air-conditioned spot such as a public building, shopping mall, grocery store, place of worship or public library.

Message 12: Take cool showers or baths until you feel refreshed.

Message 13: Prepare meals that don't need to be cooked in your oven.

Message 14: Block sun out by closing awnings, curtains or blinds during the day.

Message 15: Avoid sun exposure. Shade yourself by wearing a wide-brimmed, breathable hat or using an umbrella.

Supplemental Messages

Message 16 (Heat-Health in the North): Extreme heat puts everyone at risk of heat illnesses. People living in areas with cooler climates can be more susceptible to extreme heat than those who are regularly exposed to hot environments and have had an opportunity to acclimatize to warmer temperatures. Heat illnesses include

heat stroke, heat exhaustion, heat fainting, heat edema (swelling of hands, feet and ankles), heat rash and heat cramps (muscle cramps). Watch for symptoms of heat illness, which include:

- dizziness or fainting;
- nausea or vomiting;
- headache;
- rapid breathing and heartbeat;
- extreme thirst; and
- decreased urination with unusually dark yellow urine.

If you experience any of these symptoms during extreme heat, immediately move to a cool place and drink liquids. Water is best.

Message 17 (Heat-Health and Air Quality): Reduce strenuous activity during periods of extreme heat, and plan physical activities for cooler parts of the day. Exercise in an air-conditioned place, or a cooler outdoor location such as a tree-shaded area away from high traffic to avoid high levels of air pollution. Pollution levels tend to be higher on hot days; the Air Quality Health Index can be used to determine the air quality in your neighbourhood.

Glossary

Special Weather Statement

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Early Notification (EN)

ECCC's Warning Preparedness Meteorologists and Ontario Storm Prediction Centre operational forecasters are supporting early mobilization of public health units by notifying them in advance of issuing a Heat Warning. This allows for public health units to enhance weather monitoring, intervene with those most vulnerable and to get prepared for the potential of ECCC issuing a Heat Warning. ECCC will provide an Early Notification (EN) to PHUs that threshold conditions are predicted to be exceeded. These one-hour advance EN alerts are available via our [ECAAlertMe](#) system

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Short-Fuse Event

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Document History

Revision Date	Document Section	Description of Revisions
2.0	All	Updated to reference 34 Public Health Units Inclusion of Ontario Vigilance Bulletin and ECAAlertMe notifications.

Resources

- [Ontario Public Health Standards: Health Hazard Response Protocol, 2019.](#)
- [Ontario Public Health Standards: Healthy Environments and Climate Change Guideline, 2018.](#)
- [Meteorological Service of Canada: Weather Alerts for Canada](#)
- Health Canada: [Communicating the Health Risks of Extreme Heat Events: Toolkit for Public Health and Emergency Management Officials \(Toolkit\)](#), 2011.

