OASIS Committee Note

# Event Terms List – User's Guide Version 1.0

## Committee Note 01

## Public Review 01

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### Related work:

This document is related to:

- *Common Alerting Protocol Version 1.2*. Edited by Jacob Westfall. 01 July 2010. OASIS Standard. Latest version: http://docs.oasis-open.org/emergency/cap/v1.2/CAP-v1.2.html.

### Abstract:

The **OASIS Open Event Terms List – User's Guide** is a resource that has been developed with the aim of helping originators and consumers of CAP alert messages use the **OASIS Open Event Terms List – Lookup Table.** The resource aims to increase interoperability between digitally connected alerting systems in the business of alerting. The table entries have been formatted and structured to allow for seamless integration into any Common Alerting Protocol (CAP) based system, and the **OASIS Open Event Terms List – User's Guide** presents the details on how this can be accomplished**.**

At the time of this writing, the variety of practices employed regarding **event-types** in **CAP** messages has made it difficult to compare alert messages from different sources. The problem is one of reduced interoperability between alerting systems due to differences in the practices surrounding event-based elements in CAP messages. Aligning practices around these elements is the focus adopted for this OASIS Open work product to address the interoperability concern. The approach for this User's Guide is to provide CAP originators and CAP consumers with the guidance needed to align their practices for these elements.

### Status:

This is a Non-Standards Track Work Product. The patent provisions of the OASIS IPR Policy do not apply.

This document was last revised or approved by the OASIS Emergency Management TC on the above date. The level of approval is also listed above. Check the "Latest stage" location noted above for possible later revisions of this document. Any other numbered Versions and other technical work produced by the Technical Committee (TC) are listed at https://www.oasis-open.org/committees/tc_home.php?wg_abbrev=emergency#technical.

TC members should send comments on this document to the TC's email list. Others, including all resource users, should send comments to the TC's public comment list, after subscribing to it by following the instructions at the "Send A Comment to this TC" linked page on the TC's web page at https://www.oasis-open.org/committees/emergency/.

### Citation format:

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# Notices

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# 1 Introduction

The Emergency Management Technical Committee (**EMTC**) of **OASIS Open**, has developed this ***OASIS Open Event Terms List - User's Guide*** to support the objective of **interoperability** in the **business-of-alerting**. Interoperability is the term given to systems working together for a common cause, and this guide addresses an important aspect of that cause – the handling of information associated with an **event** deemed worthy of being alerted for. Event information is a key piece of the overall information in the **situation**.

This User's Guide discusses the concept of an event across the alerting process – throughout the **originating** phase to the **consuming** phase. The aim is to help originating **agents** provide standardized (and interoperable) **alert-worthy event** information in alert messages for consuming agents in the process [1]. This guide has been constructed to address both the observation and analysis of an event, and the larger **alerting situation** the event creates for an alerting **audience**.

Interoperability is a primary objective of the **EMTC** and many of the **Common Alerting Protocol (CAP)** based alerting systems that operate world-wide. Many of these systems are digitally connected – originating and/or consuming CAP-based **messages** on a routine basis. CAP messages are **XML**-based document files where interoperability is a key objective in its design. CAP is a means for alerting **practitioners** (a term used to combine originators and consumers into one reference), to exchange alerting information in a standardized way.

In this guide, the premise is that an **event** is identified and an alerting process is set to begin. Once the event's significance is confirmed, it is designated as an **event-of-interest**, and the analysis broadens to encompass the entire alerting situation (inclusive of the event and the alerting process). Addressing the situation, from the event **inception** to the audience **notification**, is what **OASIS Open** considers to be an alerting **service**. The ***OASIS Open Event Terms List - User's Guide*** makes frequent reference to CAP in discussing this service [2].

Prior to this User's Guide, **OASIS Open** had already published version 1.0 of an ***OASIS Open Event Terms List*** **resource**. The resource was a work product published for the purposes of promoting interoperability between alerting practitioners. Subsequent to publishing, many practitioners requested guidance on how the content of the list is best integrated within CAP. With ***OASIS Open Event Terms List - User's Guide v1.0,*** and with a backwards compatible ***OASIS Open Event Terms List - Lookup Table v2.0***, practitioners now have guidance on how to incorporate the **OASIS Open** managed list of universal event **terms** and **codes** into their service.

[1] Refer to the ***OASIS Open Event Terms List – Concept Guide*** for more on **alert-worthy** events (forthcoming).
[2] For more on **CAP**, and **OASIS Open** recommended alerting practices, see the ***OASIS Open Alerting Practices*** family of resources (forthcoming).

## 1.1 Executive Summary

The ***OASIS Open Event Terms List - User's Guide*** is less for the casual reader, and more for the expert **practitioner** (e.g. service architect, system designer, processing agent, etc.). The aim is to help practitioners build and operate a better **system** - one that connects seamlessly (i.e. is **interoperable**) with **agencies** and **audiences** on a business/client level, and with **originating** and **consuming agents** on a technical/functional level.

The **CAP** standard is a proven data standard for obtaining this goal. It is a standard for conveying all-**event,** all-**alert** information in an end-to-end alerting system devoted to the alerting objective. The CAP standard allows for a "many-originator" to "many-consumer" transfer of information on the technical and functional level, including the use of customized alerting information (if needed), in any originator/consumer relationship.

The focus of this ***User's Guide*** - the **alert-worthy** event and its larger alerting situation [3] - is just one key component of alerting information to be conveyed to consuming agents and audiences. To that end, the ***User's Guide*** discusses how to organize, structure, format, and subsequently originate and consume, the following event-based information within a CAP alert message:

a) the **nature** of an event;
b) the **impacts** of an event;
c) the **location** and **timing** of an event;
d) the event and its **relationship** to any associated secondary events; and
e) the **calls-to-action** the event may warrant.

The guide also discusses the tasks of the various processing agents involved in the alerting **service**. This includes:

a) the business front-line alert originators (observers, analysts, social scientists);
b) the technical and functional back-line CAP originators (builders, publishers, data operators);
c) the technical and functional back-line CAP consumers (aggregators, re-distributers, presenters).

It is the back-line consuming agents that are employed to service the target alerting audience. It is the front-line originating agents that start the process.

This ***User's Guide*** is also part of a series of event-focussed alerting **resources** prepared by the **OASIS Open EMTC** to cover the full spectrum of event-based information in a **business-of-alerting.**

[3] Refer to other **OASIS Open** resources, such as the ***OASIS Open Alerting Practices and Strategies*** family of resources for more on other components of alerting.

# 2 How to Use the Resource?

The **OASIS Open Event Terms List (ETL)** is a collection of 4 resources.

- ***Event Terms List - Lookup Table***
- ***Event Terms List - User's Guide***
- ***Event Terms List - Concept Guide***
- ***Event Terms List - Spectrum Analysis***

The **OASIS Open Event Terms List - User's Guide**, as part of this collection, will make reference to the other resources as needed. For more on a compiled list of **OASIS Open** event terms and codes, see the ***OASIS Open Event Terms List – Lookup Table***. For more on understanding the basic characteristics of an event, including ways to classify the nature, impacts, location, timing, and behaviors of an event, see the ***OASIS Open Event Terms List – Event Concepts***. And finally, for more on understanding the naming of events, and social science that accompanies those naming decisions, see the ***OASIS Open Event Terms List – Spectrum Analysis***.

The **OASIS Open** ***Event Terms List*** - ***User's Guide*** resource was compiled to provide guidance for **originating agencies** and their **agents** on how to select the best terms and codes from the ***OASIS Open Event Terms List*** - ***Lookup Table***, and how **consuming agencies** and their **agents** can subsequently process the chosen terms and codes. If alerting **practitioners** (originators and consumers) are only looking to obtain a basic level of functionality with this material (i.e. its standardized use and its basic benefit of interoperability), the subsections marked as "**Basic**" in section 4 will suffice. With the guidance of this User's Guide, the **OASIS Open EMTC** is asking all CAP practitioners to minimally incorporate the "Basic" function of the ***OASIS Open Event Terms List*** into their business-of-alerting service to further the objective of interoperability.

However, if the practitioner is looking to take full advantage of the ***OASIS Open Event Terms List***, and gain a deeper understanding of events and the alerting situation in the process, the subsections marked "**More advanced**" and "**Fully advanced**" in section 4 are recommended. The advanced material presented makes it possible to handle any conceivable type of event that may be considered an **event-of-interest** worth alerting for.

This Users' Guide breaks down the process of creating a **subject event** – the topic of discussion in an alert message. It does this by utilizing a series of event-based sub-processes appropriate for various entities involved in the exercise. It begins with an **observing** sub-process, followed by an **analyzing** sub-process, leading to a CAP **originating** process, and ending with a CAP **consuming** process [4].

[4] For a detailed breakdown of the processes and sub-processes of alerting, and an introduction to the terms used in each of the stages, see the ***OASIS Open Event Terms List – Concept Guide*****.**

An ***OASIS Open Alerting Practices and Strategies - Glossary*** (forthcoming) is a resource being assembled to house terms from across the many **OASIS Open** alerting based resources. Terms that are both bold and underlined, in this and other resources, are terms that can be found in the glossary. The first time a term is used in a section of a resource, that is also found in the glossary, it will be bolded and underlined to let the reader know there is a provided definition in the glossary. Being familiar with the defined terms will help with using this guide and will make navigating the resource quicker and easier.

This guide is also intended to help alerting **agencies** build a better **system**. Most existing **alerting** system documentation, whether that documentation is based on business **analysis**, business **requirements**, system **specifications**, **service**, or **training**; have been observed to use a mixture of terms from different views into the process. Mixing views can lead to **confusion** for agents building, operating, and promoting alerting systems. This guide does not go into actual system design, but learning the language of the various processes used here will help avoid some of the problems system builders often encounter [5].

## 2.1 Public Review Version [6]

This presentation of the ***OASIS Open Event Terms List – User's Guide*** is a **Public Review** presentation. In this particular presentation all feedback will be collected and reviewed. Suggestions, comments, and questions can be on any content, including the terms and codes found in the ***OASIS Open Event Terms List – Lookup Table***. Each feedback item may be used to adjust the final release copies of the ***OASIS Open Event Terms List*** family of resources (as applicable).

**OASIS Open** plans to publish a set of resources in roughly the following order as a best effort exercise (with no set timeline due to the inability to predict the availability of volunteer resources):

1) ***OASIS Open Event Terms List – Lookup Table v2.0***
2) ***OASIS Open Event Terms List – User's Guide v1.0***
3) ***OASIS Open Alerting Practices and Strategies – Glossary v1.0 (***forthcoming***)***
4) ***OASIS Open Event Terms List – Concept Guide v1.0 (***forthcoming***)***
5) ***OASIS Open Event Terms List – Spectrum Analysis v2.0 (***forthcoming***)***
6) ***OASIS Open Event Terms List – Lookup Table v2.1 (***planned***)***
7) ***OASIS Open Alerting Practices and Strategies – Glossary v1.1 (***planned***)***
8) ***OASIS Open Event Terms List – User's Guide v2.0 (***planned***)***
9) ***OASIS Open Event Terms List – Concept Guide v2.0*** (planned)

At the end of this publish cycle all resources, in the family of ***OASIS Open Event Terms List*** resources, will be at v2.0, with the **Lookup Table** having advanced to v2.1 or greater. All version 2.X resources will be jointly compatible as a package, all anchored to version 2.0.

[5] Refer to the **OASIS Open Alerting Practices and Strategies** family of resources (forthcoming) for more on system design.

[6] This Public Review section will be removed before the final Committee Note for v1.0 of this resource is published.

## 2.2 **Activity-of-Alerting** Suggested Task List

The following is a suggested list of tasks as recommended by the **OASIS Open EMTC** when conducting an **event**-based alerting process. Each ordered task aligns with the objectives and processes discussed in this ***User's Guide*** and with the material covered in the ***OASIS Open Event Terms List*** family of resources. Many of the descriptive terms used in this list are discussed in detail in the ***OASIS Open Event Terms List – Concept Guide***.

**Originating agents:**

a) **Observe** and **identify** an event **situation** (**single** or **complex** [7]);
b) **Analyse** the events in the situation and devise and form the **events-of-interest** (an event-of-interest could cover the entirety of the event situation, or any subset part of the situation, with each dependent upon the nature of it's **conditions** and **impacts)**;
c) **Devise** and **form** the **alert-worthy** events for the target client (an alert-worthy event could also cover the entirety of the situation, or any subset part of the situation, with each dependent upon the nature of it's **conditions**, **impacts, location** and **timing)**;
d) **Associate** the alert-worthy events with other associated secondary events-of-interest to devise and form a **subject event** for the alerting process (there is wide leeway to what constitutes a subject-event). Subject events may be composed of a single event, a complex event, or an even larger complex event once all the secondary events are taken into consideration);
e) **Assemble** the larger alerting-situation information (this includes information on the subject-event; any and all supporting information; and any lead time, intersection time, and follow time information the target audience needs for coping with the subject event). This also includes using terms and codes as given in the ***OASIS Open Event Terms List***;
f) **Originate** an **alert** (the process of publishing one or more alert messages, ideally in CAP form, to address the larger alerting situation).

**Consuming agents**:

a) **Initiate** or confirm a **connection** (for consuming CAP **messages**);
b) **Consume** messages for processing;
c) **Interrogate** each alert message and subject event (for filtering, routing and presenting purposes);
d) **Establish,** and if necessary **maintain,** an alert notification signal for either:
    a. the next agent along the path of distribution, or
    b. the last-mile target audience at the end of the path of distribution.

[7] A **complex event** is a group of two or more events gathered into one event and dealt with as a group event. Refer to the ***OASIS Open Event Terms List – Concept Guide*** for more on **complex events**.

# 3 Event-Based Processes

In this ***User's Guide***, a variety of larger alerting situations are exampled. The terms used in the examples are associated to one or more of the event-based processes as discussed in the ***OASIS Open Event Terms List – Concept Guide*****.** With the ***Concept Guide*** and this ***User's Guide***, there are four main processes (sub-processes to the overall process), that attributed to the four main identifiable parties involved in the alerting process.

1) **"Observing" process:** a process that pertains to agencies and agents responsible for observing and identifying events.

2) **"Analyzing" process:** a process that pertains to agencies and agents responsible for analysing **events, events-of-interest, alert-worthy events,** and **subject events**, all for the purpose of potentially alerting for them [8].

3) **"CAP Originating" process:** a process that pertains to **agents** responsible for originating a CAP-based alert message.

4) "**CAP Consuming" process:** a process that pertains to agents and audiences found at the end of the path-of-distribution of a CAP-based alert message.

## 3.1 "Observing" Process

In the "**Observing**" process, the objective is to identify any events, and any secondary related events, as potential **events-of-interest**, specifically for the purposes of advancing the alerting process. Events-of-interest can be singular events (one identifiable event) or complex events (two or more identifiable events that together as a group are considered one larger event). They are identified by their nature (i.e. by their **observed condition** and **impact**) [9].

## 3.2 "Analyzing" Process

In the "**Analyzing**" process, the objective is to reconcile the details of the **events-of-interest** from the perspective of impacted parties. The process takes the **event situation** and establishes a communication framework for the forthcoming **alerting situation** (i.e. the agency/audience interaction and all which that encompasses). It is here where **alert-worthy** events, the **subject event**, and any noteworthy **secondary events**, are clarified. It also where new events, such as

[8] The terms **event, event-of-interest, alert-worthy event,** and **subject event**, all pertain to the same situation under observation, however, each term is used under a different set of circumstances in the alerting process. Each term is used in progression in the alerting process as the details of the situation are examined. Not all events become events-of-interest; and not all events-of-interest become alert-worthy events; and not all alert-worthy events become subject events. For more on these terms, see the ***OASIS Open Event Terms List – Concept Guide***.
[9] Refer to the ***OASIS Open Event Terms List – Concept Guide*** for more on **observed condition** and **impact**.

solicited **action** events the alerting agency is asking of impacted parties (i.e. any actions to take during the lead time (ahead of the event), the intersection time (during the event) and the follow time (after the event) all due to instance and occasion of the subject event).

## 3.3 "CAP Originating" Process

In the CAP Originating process, the objective is to clarify the pieces of information that support originators building a proper alert message using the CAP standard. Elements of information in the CAP model are designed to make the exchange of information meaningful to all parties. The aim of CAP originating parties is to create a set of standardized elements of technical and functional alerting information for agents of their consuming client's needs.

One objective of the **User's Guide** is to make the originating process easier while simultaneously meeting the needs of all the various consuming parties. The **OASIS Open EMTC** perspective for CAP originators is to not necessarily have them create separately structured CAP product for each and every CAP consuming party, but to have one CAP message that can service them all [10]. The CAP standard is designed to make this possible [11].

## 3.4 "CAP Consuming" Process

In the CAP Consuming process, the objective is to clarify the pieces of information that support consumers processing a proper alert message based on the CAP standard. Elements of information in the CAP model are designed to make the exchange of information meaningful to all parties with the aim of having consuming parties able to properly use the elements for their needs.

One objective the ***User's Guide*** is to make the consuming process easier while simultaneously allowing originating parties the ability to service all their consuming partners simultaneously with the same set of CAP alert messages. The **OASIS Open EMTC** perspective for CAP consumers is to not have them make improper assumptions on the information received, nor have to create additional information to make their service successful. The CAP standard was designed to make this possible [12].

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[10] The strategy of one message for all consumers has its advantages and disadvantages, however, the disadvantages stem more from a poor system design than from the standard itself. **OASIS Open** recommends becoming familiar with good system design with the help of the **OASIS Open** resources built for this purpose, so that the many advantages inherent with using the one CAP message for all consumers can be realized.

[11] While the CAP Originating view covers much more than just event information in the larger alerting situation, this guide primarily focuses on event information. For more on the CAP Originating view regarding events, see the ***OASIS Open Event Terms List – Concept Guide***. For more on the CAP Originating view regarding other aspects of alerting, see the ***OASIS Open Alerting Practices*** family of resources.

[12] While the CAP Consuming view covers much more than just **event** information in the larger alerting situation, this guide does primarily focus on **event** information. For more on the CAP Consuming view regarding **events**, see the ***OASIS Open Event Terms List – Concept Guide***. For more on the CAP Consuming view regarding other aspects of alerting, see the ***OASIS Open Alerting Practices*** family of documents.

# 4 Establishing the Baseline for the Alerting Process

This section outlines the foundational alerting workflow that underpins the four **business-of-alerting** processes defined in the ***OASIS Open Event Terms List*** family of resources. It reinforces terminology introduced in the ***Concept Guide*** and introduces additional terms as required.

Following the process discussion, a representative event situation is presented. This scenario serves as a baseline case for establishing a set of baseline steps that can be adapted to a variety of real-world situations. These steps form the backbone of consistent alerting practices across event types.

The ***Example Situations*** section of this guide builds upon this baseline by exploring case-specific variations. While these examples retain the core principles outlined here, they also highlight distinctive circumstances and considerations unique to each scenario. The primary focus remains on the concept of "**event**," while other components of the alerting process (alerting signals, layers, profiles, over-alerting, etc…), are covered in separate documents within the **OASIS Open** set of resources [13].

The process accommodates both **single-event** and **complex-event** scenarios. Complex-events often involve multiple events as observed and are explored in depth in this guide. Single-events are treated as subsets of complex-events and serve as entry points for new users. Learning to manage single-event scenarios is encouraged before tackling complex-event cases [14].

The baseline case presented here involves a **complex-event** that associates several individual **single-events** into one event situation. It is analyzed through three lenses:

- Simple alerting situation (picking one event at exclusion of the others)
- Advanced alerting situation (picking two events that can easily be aggregated into one larger event)
- Fully advanced alerting situation (picking four events that are all associated with each as suggested by business policy and the example event situation as given).

Each perspective demonstrates how the Common Alerting Protocol (CAP) standard's features can be leveraged effectively [15].

[13] Such as the **OASIS Open Alerting Practices** family of resources.

[14] Refer to the **OASIS Open Event Terms List - Concept Guide** for more on single and complex event situations.

[15] The analysis and discussions provided here reflect the **OASIS Open** perspective and do not imply any absolutes in the alerting process. However, they are intended to serve as guidance, offering a path forward toward achieving **interoperability** between alerting services, whether or not the Common Alerting Protocol (**CAP**) is actually utilized in the process.

## 4.1 Baseline Process

This guide presents a comprehensive, end-to-end sequence for alerting, beginning with the observation of an **event** (real or imagined [16]), and concluding with an alert **notification** of a **subject event** to the alerting agency's target audience. While the steps are described broadly, some components of the baseline process may be unfamiliar to certain agencies.

This example baseline case serves as the universal reference model for all subsequent examples provided in the ***Example Situations*** section. Unless explicitly stated, the principles outlined in this baseline case will apply across all additional scenarios. Subsequent analyses of the additional scenarios will focus on how each case diverges from the baseline case, shedding light on their unique elements.

To achieve interoperability across organizations, the **OASIS Open EMTC** recommends standardizing specific steps within the CAP alerting workflow. These universal steps span the following sub-processes: observing, analyzing, originating, and consuming. This guide aligns these steps with the use of **events**, **event-types**, and **event terms**, as discussed in the ***OASIS Open Event Terms List*** family of resources.

The **OASIS Open EMTC** strongly advises CAP originators to include at least one event code from the ***Event Terms List*** in every CAP message. This practice ensures consistency and facilitates system interoperability. If no exact match is found, the event-based framework described here still applies, and the ***Users' Guide*** offers instructions for maintaining interoperability in such cases.

Lastly, it's important to recognize that this process applies to all alerting agencies - public, private, and restricted alike. Whether alerts are broadly disseminated (e.g., CAP <scope> = "public") or directed to specific recipients (e.g., CAP <scope> = "private" or "restricted"), the core process remains consistent [17].

[16] Refer to the **OASIS Open Event Terms List - Concept Guide** for more on real and imagined events.
[17] For more on **distribution scope**, see the **OASIS Open Alerting Practices** family of resources (forthcoming).

### 4.1.1 Observing Process

**Typical process for identifying an event-of-interest for the alerting process:**

1) An alerting agency observes an **event situation** [18], that involves one or more **events**, with each event having the potential to lead an observer to devise and form an **event-of-interest**. The agency gathers data about the events (using direct observation, sensors, and predictive models), to help with the event-of-interest determination. The event-of-interest is an abstract concept devised and formed from the same observable conditions of the event's nature, impacts, location and timing. The boundaries of each event-of-interest's conditions, may end up being a subset part of the event it is derived from [19].

    a. The events involved are determined by the alerting business and typically pertain to those that by policy, lead to an event-of-interest (and therefore a possible larger alerting situation). The observed events ideally would be ones to have an associated **event-type** on record.

    b. The observation is conducted with a concerned **client** in mind (i.e., the target audience in the larger alerting process). Ideally, the initial observation for each event is carried out before any impacts to the client occur, however, the observation activity is expected to continue throughout the life of an event - before, during, and sometimes after the impacts for the client are realized. Sometimes, the observation process begins after the event has already impacted the audience.

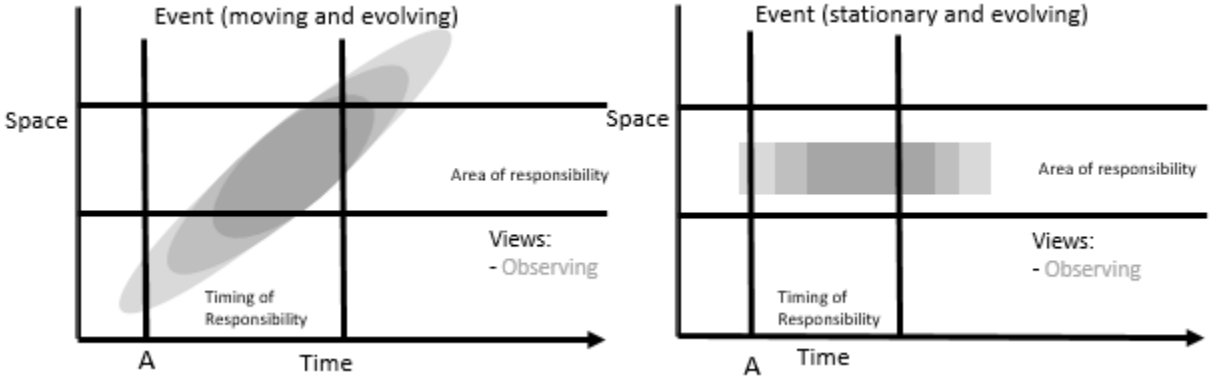
    c. The analysis stage, the stage following the observing stage, is when the **full** determination of **events-of-interest** is made. If the analysis confirms the nature, impact, location and timing are indeed interesting (either for the present or for the future), an event-of-interest **marker** is applied to the event and the observation stage continues until the event is no longer interesting.

[18] Either observed as **real** through direct observation or sensors, or observed as **imagined** based on the output of forecasting and predictive models.

[19] For further information on **events** vs. **events-of-interest** events, refer to **the Oasis Open Event Terms List – Concept Guide** for additional details.

**Background:**

In the two diagrams below, two real events (both illustrated in grey) are present at point-in-time A [20]. One event is moving and evolving, and the other is stationary and evolving [21]. Point-in-time A serves as the starting point for the observation exercise as in these two diagrams, point-in-time A is when the observer became aware of the event. Note that the events are shown as conceptual representations, without a defined scale for space or time, and the two point-in-time A markers have no relationship to each other in these illustrations – they represent separate cases.

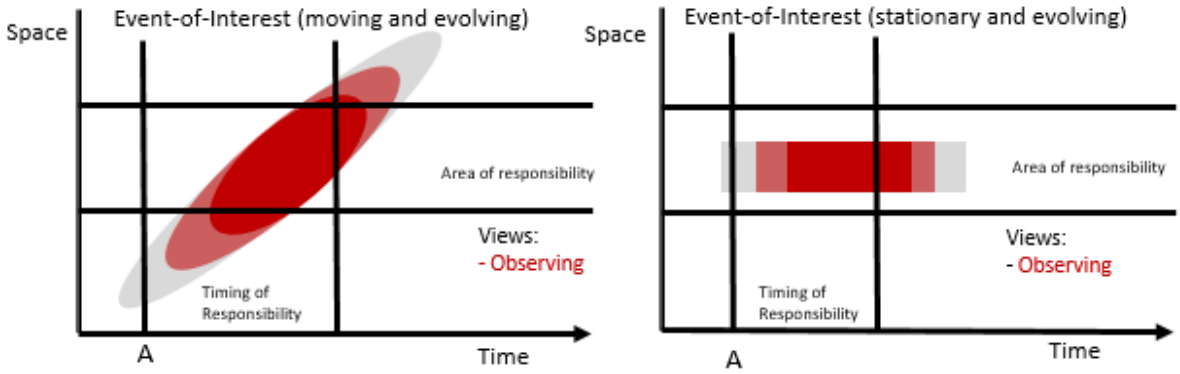



In the two example cases, the nature, impacts, location, and timing will meet or exceed the defined measures of significance (for at least some measurable segment of time), as illustrated in the concentric darker grey areas. The objective is simply to try and identify an observed situation as containing a probable **event-of-interest** (subset or otherwise), along with a general sense of the **event-types** involved.

In the two illustrated example cases, the probable events-of-interest, as per the observing process, are devised and formed as shown in red in the diagrams below. They are probable, as the area in red is in the future (as of point-in-time A). The leftover event areas shown in grey in the diagrams below, are part of the observed events that do not meet the measure of nature and impact of significant events, and therefore are not part of the probable events-of-interest.

[20] Refer to the **Event Terms List – Concept Guide** for more on the use of space/time diagrams and on concepts such as the **area-of-responsibility** and the **timing-of-responsibility**.

[21] For further information on **moving** vs. **stationary** events, refer to **the Oasis Open Event Terms List – Concept Guide**. For further information on **evolving** events (and its binary compliment, the static event), refer to **the Oasis Open Event Terms List – Concept Guide**. Static event cases are simply a subset of evolving event cases and, although not shown, they are equally applicable to these diagrams and the observing process.




There are now two events shown in each of the two diagrams, the core **event** in grey and the **event-of-interest** in red. And while they stem from the same event situation and comprise many of the same conditions, they are treated as separate and distinct events, each with its own devised and formed interpretation (two grey and two red).

All four interpretations are abstract constructs. Each construct is based on a different set of bounding criteria which form each interpretation [22]. Additional interpretations, the **alert-worthy** alerting event and the resulting alert message **subject-event**, are discussed later in the analysis stage.

2) For any observed event within the situation, if the **level of significance** for any one of the **measures** listed below is not close to being met ("close" being a subjective assessment), the observed event may be excluded as a probable event-of-interest and dismissed from further analysis [23].

   a. If the **nature** of an event in the observed situation does not satisfy any measure of conditional significance, the event may be dismissed (e.g., a wind event situation being nothing more than a breeze).

   b. If the known **impacts** of an event, based on its event-type, does not meet any measure of impact significance, the event may be dismissed (e.g., a wind situation isolated to a mountain peak. It may fall within an agency's area and

[22] For further information on these interpretations and other interpretations of the same core event, refer to **the Oasis Open Event Terms List – Concept Guide** for additional details.

[23] The measure of an **event-of-interest** in the observing view is an incomplete assessment, resulting in more leeway in assigning the event-of-interest tag to an event than that of the analysing view. The efforts of the analysing view are to determine an **actual** event-of-interest status.

timing of responsibility, however, it could still be outside the audience's **area-of-concern** due to no actual audience present, resulting in no audience impact [24]).

c. If the spatial **location** of an **event** in the observed situation is not significant, the event may be dismissed (e.g., an offshore storm moving away from any agency's **areas-of-responsibility**).

d. If the **timing** of an **event** in the observed situation is not significant, the event may be dismissed (e.g., a distant storm that is not expected to reach the area of responsibility until much later, well after the agency's current **timing-of-responsibility** period).

    i. If the event is a moving event, and its most likely path is anticipated to bring it into the area-of-responsibility at some far distant time, it would likely qualify as an event-of-interest, however, not yet leading to an alert-worthy event. It remains under observation until some future point-in-time when the situation changes [25].

3) At the **current** point in time, determine whether the events-of-interest are in a real or imagined state [26]. This is done while acknowledging that any imagined state may not be realized, or may change to a real state over time as new information becomes available.

4) The monitoring range in **space** for **moving** situations is likely much **broader** than the range in space for stationary situations. For stationary situations, the monitoring range would typically **align** with the alerting agency's area-of-responsibility.

5) The monitoring range in **time** for **evolving** situations is likely much **longer** than the range in time for static situations. For static situations, the monitoring range would typically align with the alerting agency's timing-of-responsibility.

[24] Meaning no "public" impact; however, if a search and rescue operation were underway on the mountain peak and in contact with the alerting agency, a **temporary** area-of-concern could be established. For more on area-of-concern refer to the **OASIS Open Event Terms List – Concept Guide**.

[25] This is also highly dependent on the lead-time policies of the alerting agency and the current sensitivities of the audience. An area that has recently experienced a series of storms causing disruptions within its area-of-responsibility might prompt the alerting agency to extend the timing-of-responsibility period to address the audience's heightened sensitivities.

[26] Refer to the section on real vs. imagined events in the **Oasis Open Event Terms List – Concept Guide** for additional details.

6) The criteria for measuring the significance of an **event-of-interest**, based solely on the **nature** of the events, are likely broader in scope than the agency's criteria for an actual **alert-worthy event** (see next section). The evolving and sometimes unpredictable nature of certain events could easily transform a **nearly** alert-worthy event-of-interest into an **actual** alert-worthy event-of-interest at a future time.

7) The alerting agency typically identifies a **primary** event within the observed situation. This could be an individual event (e.g., a tornado) or a complex-event event (e.g., a storm, composed of a wind event and a precipitation event) [27]. This preliminary assessment may change during the subsequent analysis stage.

8) The alerting agency should identify any **secondary** events within the observed situation. If any secondary events are deemed events-of-interest, the situation is tentatively classified as a **complex-event** situation. However, the resulting larger alerting situation may still deal with the multiple events-of-interest separately, a determination made in the analysis stage.

9) The alerting agency should identify **risk** or **threat** events that may lead to one or more follow-on events-of-interest [28]. These risk or threat events, which are pre-existing and/or antecedent secondary events, form part of the larger alerting situation surrounding a follow-on alert-worthy event. Pre-existing or antecedent condition events are treated the same as other events and are also classified as real or imagined based on their own nature [29].

10) The alerting agency may assign a **label** to the observed situation, such as a name or an incident tracking identifier (e.g., a name like "Tropical Storm Milton" or an identifier like "AAA-001," where "AAA" represents the reporting entity's code and "001" is the incident tracking number for that entity). This label assignment may also be applied during the analysis stage.

11) The alerting agency may choose to record the observing-process event information in a data object for post-analysis and future research. Such activities often help identify improved methods for observing similar situations in the future. Observing-process event information, with its wider leeway parameters, may extend beyond the scope of the analyzing-process event information compiled later.

[27] Refer to the section on **complex-event** situations in the **Oasis Open Event Terms List – Concept Guide** for additional details.
[28] Refer to the section on **risk** and **threat** events in the **Oasis Open Event Terms List – Concept Guide** for additional details.
[29] Refer to the **Example Situations** section later in this guide for additional insights and discussion.

### 4.1.2 Analyzing Process

**Typical process for identifying alert-worthy events and subject events in the alerting process:**

1) An alerting agency analyzes the event data of an observed **situation** to determine if any devised and formed events-of-interest are **true** events-of-interest – possibly leading to the need for an **alert-worthy** event construct [30]. The analysis would apply to both the current and future states of an event-of-interest (as per the standard practices of the alerting agency).

    a. Each potential event-of-interest in the observed situation would be assessed against its own **measures of significance** based on condition, impacts, location, and timing (as outlined by the alerting agency's policies based on event-type) [31].

        i. For each potential event-of-interest the alerting agency **assesses** the accuracy of the reported situation in the observing process and validates or adjusts the reported conditions to a final working assessment for the remainder of the analysis process.

2) The alerting agency analyzes the events-of-interest to determine any **alert-worthy events**. Like events-of-interest, alert-worthy events are abstract constructs - separate events devised and formed from the same observable conditions. Each construct (event-of-interest and alert-worthy event) is based on a different set of bounding criteria which form the event interpretations.

        i. For each event-of-interest the alerting agency **compares** the alerting agency area-of-responsibility and timing-of-responsibility with the event-of-interest area and timing. An analysis is completed to determine where and when the two areas and timings intersect with each other. The intersection defines the interpretation of an **alert-worthy** event (i.e. it creates the space and time boundaries of an alert-worthy event).

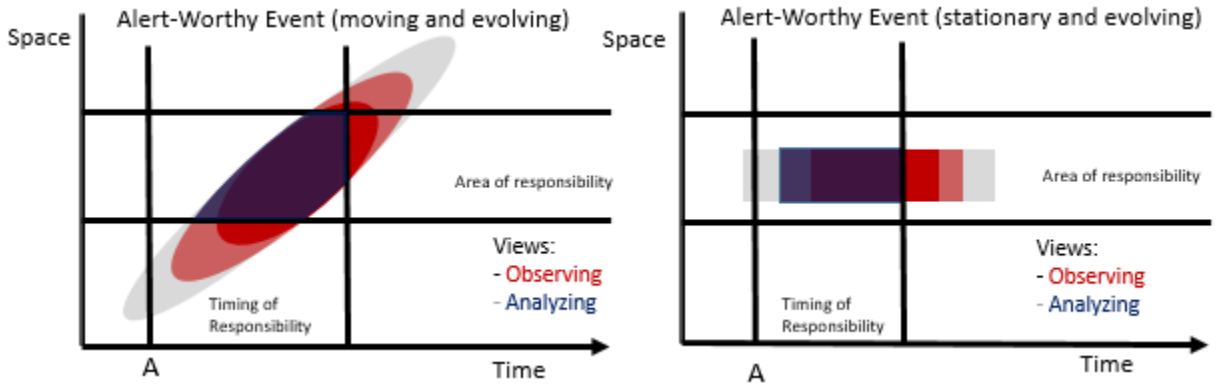
        ii. If an event-of-interest is determined to not be an alert-worthy event after analysis, it may still be interesting, either as an associated secondary event to another alert-worthy event, or as a possible future alert-worthy event. It may also be worth commenting on in the larger alerting situation for the target audience of the associated alert-worthy event.

[30] Refer to the section on **alert-worthy** events in the **Oasis Open Event Terms List – Concept Guide** for additional details.

[31] Typically done as one activity, they are discussed here separately to clarify the overall objective of the task.

**Background:**

The diagrams below, using the same two real and evolving events exampled in the observing process earlier, illustrate in blue the **alert-worthy** space and time boundaries of concern for the two events. In these examples, the alert-worthy event interpretation is a subset event of the event-of-interest.




a. For each alert-worthy event the alerting agency determines the **degree** of significance based on the **nature** of the event within the area and timing of responsibility.

b. For each alert-worthy event the alerting agency determines the **degree** of significance based on **impacts** of the event within the area and timing of responsibility [32].

3) For each event-of-interest, the alerting agency references the relevant history, research, science, conventional wisdom, and policies from the **event-type** for useable **alert-worthy event** based information (i.e. policies, practices, procedures, etc.).

4) If there is more than one event-of-interest, the overall situation is a **complex-event** situation. The alerting agency then is to decide how many alerting situations involving alert-worthy events are actually contained within the overall situation [33].

a. For each alerting situation in the observed situation, the alerting agency determines which alert-worthy events are to be part of which alerting situation.

[32] Impacts may include the spawning of yet another event-of-interest that is part of the subject event of the alerting process, a new event-of-interest with its own set of impacts. However, pre-existing and antecedent conditions may also play a factor in those other impacts. See the later **Example Situations** section for such cases.
[33] See section on Complex Events in the **OASIS Open Event Terms List – Concept Guide** for more information.

b. If two or more alert-worthy events are placed into one alerting situation, then that alerting situation is a **complex-event** alerting situation [34].

c. Placing one alert-worthy event into two or more alerting situations is also a possibility and it is the purview of the alerting agency to do so, however, it does presume that two or more co-existing alerting situations stemming from the same alert-worthy event would not be providing contradictory information.

5) Each event-of-interest that becomes a **primary** alert-worthy event in one alerting situation, could still be considered as a secondary event in another alerting situation.

a. As part of the alerting situation, the alerting agency clarifies the **primary** alert-worthy event and any associated secondary events-of-interests (e.g. a secondary earthquake event-of-interest that a primary tsunami alert-worthy event associates back to). The association can be made by standard alerting agency policy (i.e. certain event types always associate with other event types, for example, snow and cold), or can be made based on familiarity (i.e. certain event types associate with each other based on the experiences of the agency and its agents, for example, wind and electrical power grid outages) [35].

6) Determining an actual location in space and interval in time for the entire event (the grey areas in the above diagram, including the red and blue area), is often considered valuable information for parties that might have an interest in such information. Such information is sometimes useful when telling the story as part of the larger alerting situation to an audience. This would be at the discretion of the alerting agency to decide whether to include it or not as part of the story.

7) During the entire event-of-interest, if there is an oscillation (i.e. an ebb and flow of an evolving event being in and out of significance), the decision on whether to treat the observed situation as one or several event-of-interests is usually a business policy decision. Often, such decisions derive from working backwards from the alerting situation (e.g., knowing what the preferred outcome of the larger alerting process is). This would be a consideration in the earlier analysis process [36].

[34] Alerting for more than one alert-worthy event in a single alerting process (i.e. a single alerting situation) is not uncommon for alerting agencies. Such approaches are often employed as a means to reduce message fatigue, however, this would need to be balanced against overloading a message with too much information making the message difficult to digest easily. Refer the to the **OASIS Open Alerting Practices and Strategies** family of resources for more information on how to handle this balancing.

[35] Refer to the section on **Associated Events** in the **OASIS Open Event Terms List – Concept Guide** for more information.

[36] Refer to the **Examples Situations** section for such cases and the **OASIS Open Alerting Practices family of resources** for more information (forthcoming).

8) Once the compliment of **alert-worthy** events for each alerting situation has been determined, the union of the alert-worthy events then becomes the **subject-event** for the alerting situation. The subject event is another abstract construct – another event-based definition devised and formed from the same set of observable conditions.

    a. If the entire event situation is a single event, the compliment of alert-worthy events is only one event, thereby making the **alert-worthy event** and the **subject-event** the same.

    b. For a **complex-event** case, this may mean assigning some of the **subject-event** details from one **alert-worthy** event and some of the details from another **alert-worthy event**, or alternatively, having the details from one alert-worthy event become proxies for the others [37].

9) Alerting agencies sometimes recognize that the space and time boundaries of an event-of-interest are not measurable. If that is the case, the missing boundaries are not necessarily a critical missing piece of the subject-event at this point. Location and timing policies for alert-worthy events and subject events can be set by policy to produce space and time boundaries for those constructs [38].

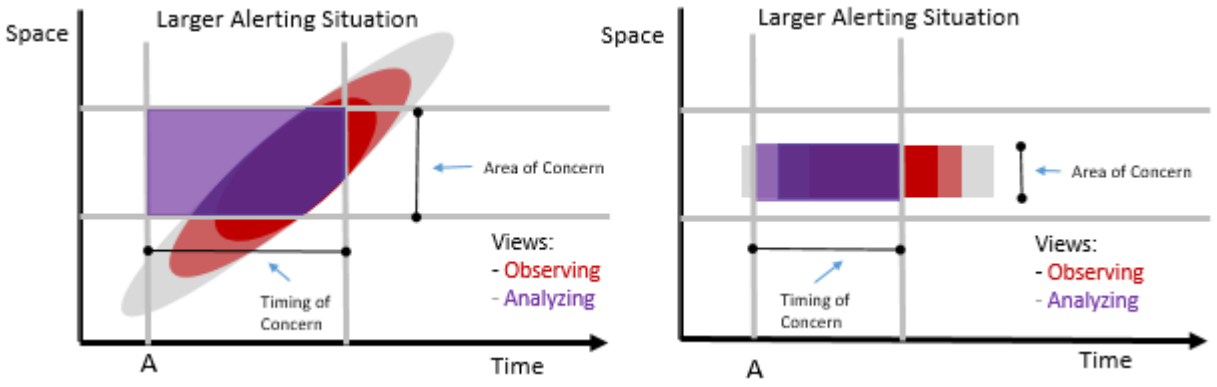
10) Near the end of the analysis stage, the alerting agency re-connects the **subject-event** back to known event-types. The event types are likely the same as they were during the observation stage, however, it could have changed based on the analysis of the event situation and the larger alerting situation.

    a. The analysis collectively includes the **primary** event-of-interest, the group of associated secondary events-of-interest, and from experience, a general idea of what the larger alerting situation for the target audience may end up being. The re-connection back to event types can be formal (as part of alerting agency policy), or informal (based on the experiences of the agency, community, and their agents). Any secondary event-of-interests should be similarly re-connected to their event types. Occasionally, during the analysis, a secondary event-of-interest may take over as the primary event-of-interest.

[37] See the later Example Situations section for more on such cases.

[38] See the examples and analysis sections for such cases and the **OASIS Open Alerting Practices** family of resources for more information (forthcoming).

11) After the alerting agency determines the make-up of the **subject event**, the focus is on the **larger alerting situation** as it pertains to the consuming audience (as shown in purple in the diagram below).




a. If the **subject-event** is an anticipated event (real or imagined), the larger alerting situation will have a timing that includes lead timing, intersection timing, and possible follow timing [39].

b. If the subject-event is underway within an area-of-concern, the larger alerting situation will have no lead timing for some or part of the area, especially if the event is a moving event. Past event information, while interesting, is outside of the lead time period and is now just information for the larger audience story.

c. Follow-timing information is less often incorporated in the alerting story, however, it can be important if follow-time impacts are expected. Follow-time situations, after the alert-worthy event has ended, are typically used for extremely hazardous event situations. Past information is common in follow-time alert messaging.

    i. If the primary alert-worthy event is ended (a real past event), and there are still follow time impacts which linger, the larger alerting situation will have a timing that now includes only follow-timing. The subject-event for the alerting situation now changes to one of the follow time secondary events. That subject event would now have a focus on a follow time alert-worthy event which would become the primary event in follow time messages.

[39] Refer to the section on **Situation Timing** in the **OASIS Open Event Terms List – Concept Guide** for more information.

ii. The alerting situation may still be considered the same alerting situation after the initial primary event has ended (e.g. a “typhoon” alert-worthy event that has ended, however, a “typhoon emergency” alert-worthy event remains - due to devastating and lasting impacts of the recent typhoon).

1. The alerting agency might want to name the alerting situation a “typhoon emergency” from the very beginning, anticipating follow-on messaging. This strategy connects messages published before, during and after the typhoon emergency to a single named event – supplying quick context to the follow time messaging.

12) When the subject-event is for a **complex-event**, then the larger alerting situation is considered a **complex-event** alerting situation. In such cases, it is recommended that the name of the larger alerting situation should represent the “complex event” (i.e. a “storm” situation, when two “rain” and “wind” events are combined to make up the complex event storm situation). Alternatively, if two separate and distinct alerting situations are preferred by the alerting agency (one wind, one rain), then this is a case of how the alerting process itself can affect the overall situation analysis [40].

13) The alerting agency takes the additional details of the larger alerting situation and reconciles these details with respect to a story they want to convey to their alerting audience.

a. Details to reconcile with the larger alerting situation may be unique to the situation and be introduced as a judgement call during the analysis (i.e. evacuation routes that are normally used might be blocked due reasons outside of the control of emergency responders).

b. Details may emerge from the larger situation involving proxies based on the capabilities of the alerting process itself. Knowing the alerting process capabilities, the construction of alert messages may be affected.

[40] Such situation-based attributing information can be compiled into the complex-event event type, if applicable, and should be therefore be available for use in the event-of-interest analysis stage.

iii. The actual true location of the **subject event** may not match with any pre-defined alerting zones used by an agency. A true alert-worthy event location-mapping to alerting-zone process may expand on the area, resulting in a larger alerting area than that of the event-of-interest that triggered the alert (i.e. a case of over-alerting the area-of-concern) [41].

iv. The actual true timing of the larger situation may not match with the publishing timing of new alert messages. The alerting update process typically is done based on the workload of front-line agents and often updates or endings of an alert occur after portions of the audience are already free of the impacts of the event-of-interest [42].

14) The alerting agency determines the name for an **alert** best suited to cover the larger alerting situation. An alerting agency typically names an alert in consideration of the alerting audience, trying for a short, accurate, descriptive name for use in the any presentation of the alert messages (i.e. as used in titles/headlines/etc.). Those alert names typically include a descriptor involving the event type, however, that is not always the case [43].

    a. If any associated event-of-interests and secondary events are to be covered within the alerting situation, select a name for the alert that best covers the larger complex-event situation.

15) The alerting agency constructs well suited alert message text for the larger alerting situation. This would be based on the chosen subject-event part of the larger alerting situation as well as any message text for each alert-worthy event that is included.

16) The alerting agency augments the alert message text from the previous step based on the relevant compiled history, research, science, conventional wisdom, and policies stored with the corresponding event types that make up the subject event.

[41] From the messaging view, as dictated by the process, all pre-defined alerting zones that overlap with the true area of the subject-event are usually included leading to spatial over-alerting for some of the area within an alerting zone. For more on over-alerting, see the **OASIS Open Alerting Practices** family of resources (forthcoming).
[42] From the messaging view, as dictated by the process, time and location referencing in alerting messages is often for group locations, causing some subject-event locations to experience temporal over-alerting for some of the area within an alerting zone. For more on over-alerting, see the **OASIS Open Alerting Practices** family of resources (forthcoming).
[43] Refer to the section on **Naming Alert Objects** in the **OASIS Open Event Terms List – Concept Guide** for more information.

a. Knowing the primary event type for the subject event and the composition of the larger alerting situation, the alerting agency checks the compiled history, research, science, conventional wisdom, and business policies for helpful information on terms, instructions, known impacts, call-to-action statements, codes, procedures, etc. to include in the alert message.

17) If the larger alerting situation is expected to change, or continue on past the current timing-of-responsibility for the alerting agency, then a continuation of the alert is to be dealt with using updated alert messages published at a later time. Knowing this, the focus of the larger alerting situation can be weighted to the near future, leaving the far future details for these later messages.

a. These later messages include ended messages (i.e. a CAP message type of "Cancel" where the last mile presentation agency is instructed to discontinue the alerting signal).

### 4.1.3 CAP Originating process

**Typical process for originating a CAP alert message with event based information:**

The process outlined here is typical for an agent on behalf of an alerting agency when originating a **CAP** alert message. The **OASIS Open EMTC** recommends populating the **subject-event** information and the larger **alerting situation** information into CAP messages as per the following steps. The agent could either be an operator entering alerting information into a CAP-based interface or a written program that converts externally entered information into CAP-based alert messaging [44].

A CAP message revolves around a **subject event**, which is a group of one or more alert-worthy events, each with their **event type**. Without an event type, the alerting situation addressed by the message would likely require a lengthier qualifying description, demanding more time and effort than is typically ideal for an audience in the consuming moment of concern. By introducing the event through an associated event type (e.g., using a headline or other mechanism), an alerting agency can convey the importance or significance of a subject event quickly and efficiently. The full details of the actual alerting situation can then be subsequently shared with an audience that is already engaged as a result of consuming the headline. The event types used in this messaging process are derived from the earlier analysis stage that has already been completed.

**The alerting agency initiates a process to originate a valid CAP file. The CAP elements outlined below are linked to the event or event types in a CAP alert message.**

1) **Element: <event>** cap.alertInfo.event.text (required).
   This is a basic element that is required in CAP. A CAP message with no **<event>** element is an invalid CAP message.

   **Definition (CAP v1.2):** The text denoting the type of **subject-event** of the alert message.

   **Objective:** The objective of the <**event**> element is to assist consuming agencies in clearly communicating to their audiences the type of event associated to the subject-event in messages published by the CAP alerting agency.

   b. With the expectation of well-crafted text, as per the social science of the situation, the <**event**> element's value is designed to provide immediate context to an audience the reason for the alert message. The text should generate an association to a familiar type of event for the audience. Audiences are then prepared to receive, with context, the remaining message information that follows.

[44] Refer to the baseline case example situation later in this section for further details.

c. The <**event**> element is a display-based, audience-facing element composed of free-form text. It is designed in CAP to be a fully flexible element, capable of delivering **event-type** information to any audience without the limitation of pre-published values. As an audience-facing element, the meaning of the value is only constrained to the operating language of the alerting service, not to any functional language between agents executing the service.

    i. The <**event**> element is often constrained within an alerting service to pre-set values (as pre-set values are a sub-set of all possible values), however, the decision to do so risks affecting the ability of alerting agencies to adjust to unexpected situations and/or adapt to changes moving forward when constrained to a formalized change process.

        1. New event types are typically discovered as they are happening. Change process delays, due to new configuration and partner coordination, may impact the ability to provide a timely service for new event types if only pre-set values are used. The ability to add new types quickly is highly recommended in any alerting service.

        2. The **OASIS Open EMTC** recommends, that originating agencies that employ a set of enumerated **event-types** that provide pre-set values for the <**event**> text element, should make it clear:

            a. that the names associated to the **event-types** are for display purposes and could change without notice; and

            b. that consuming agents and agencies wishing to automate processing functions (based on the <**event**> element)**,** should use other CAP elements, including the agency's compliment of <**eventCode**> elements [45].

d. The originating agency expects the <**event**> value to be either displayed as provided (e.g., <**event**>); used within a constructed presentation that incorporates the value (e.g., "**Event type: <event>**"), or omitted in favor of alternative elements such as <**headline**>, or other presentation constructs derived from the <**eventCode**> element (e.g., **icons** or **symbols**).

[45] <**eventCode**> elements are enumerated into a finite and predictable set for consumers, making the <**eventCode**> element the preferred choice for automation processes based on event-type. For more on <**eventCode**>, refer to later sections in this Guide and the related **OASIS Open Event Terms List – Concept Guide**.

e. The alerting agency should construct the <**event**> element in a CAP message using an attribute of the **event-type** that describes the event-type by name. This name attribute should be defined as free-form text, reflecting the alerting agency's local terminology in accordance with the operating language of the alerting service. The selected value should take into account the perspective of the target audience.

    i. The <**event**> element is not used to describe an actual event; rather, it is populated to indicate a type of event. For example, the <**event**> element would be assigned <**event**>hurricane</**event**> (an event-type name) rather than <**event**>hurricane Katrina</**event**> (the name of a specific event).

f. If no acceptable event-type name is available locally, a term may be entered manually if the local process allows. The entered term would be expected to be displayed by consuming agencies as given. Alternatively, the originating agency may also check the **OASIS Open Event Terms List – Lookup Table** to find an event-type term that aligns with the local event-type's meaning and understanding. Note that since the **OASIS Open Event Terms List** is not translated into other languages, any necessary translations should have been completed in advance and stored as part of the **event-type** information.

g. If no exact match is found in the **OASIS Open Event Terms List**, a close acceptable match may be selected. Suitable alternatives include:

    i. variations of the same term (e.g. "flood", "floods", "flooding"), or

    ii. synonymous terms (e.g. "tropical storm" and "tropical cyclone"), or

    iii. a more general term that serves as an acceptable proxy for a more specific term along the general-to-specific spectrum (e.g., "wind" as a broader term for "small craft wind") [46], or

    iv. a best judgement call.

[46] "Small craft wind" is not in the OASIS list due to it being a scale-based event type. For more information on the spectrums of terms, see the **OASIS Open Event Terms List – Spectrum Analysis** resource (forthcoming).

h. If no close acceptable match is found in the **OASIS Open Event Terms List**, then the event term "other" should be the **OASIS Open** term identified for use [47]. The use would be for the <**eventCode**> element as discussed below, not for the <**event**> element discussed here. The <event> element would be populated as discussed above in the previous sub section.

    i. For alerting originators, using "other" for the <**eventCode**> element means the matching process was attempted, however, nothing acceptable was found. This outcome is preferred as compared to the outcome where the matching process gives the impression of a step ot being attempted at all. The term "other" is an **interoperability** requirement allowing consumers some recourse of action when "other" is encountered as an <**eventCode**> – see the following **CAP Consuming process** section below.

    ii. The term "other" in the <event> value is not prohibited; it's typically considered meaningless for most presentation systems and therefore is not recommended.

    iii. If "other" is found as a match, the **OASIS Open EMTC** recommends that the alerting agency consider **submitting** a new event term for review. This term would replace "other" in future instances of the currently unmatched event-type for the local alerting agency. The submission process is outlined in the section on **Submitting Content** in the **OASIS Open Event Terms List – Lookup Table**.

i. If any associated **events-of-interest** are identified, and are to be handled collectively as one **complex-event**, the <**event**> element value should represent the broader event situation as a whole. For example, instead of specifying a narrower event such as <**event**>power grid failure</**event**>, a more encompassing event term like <**event**>service interruption</**event**> could be used instead [48].

    i. Continuing with the complex-event example, if the overall complex-event situation is deemed as a group the **primary** event-of-interest, the complex-event becomes the event that anchors the **larger alerting situation**. The individual events-of-interest that make up the complex-event may or may

[47] See the relevant examples in the later **Example Situations** section on how this is done.

[48] Complex-events cannot easily be addressed using a **standardized** methodology. Each individual event in the grouping is typically analyzed based on its unique characteristics, leading to diverse approaches for grouping them. For further discussion on complex-events, refer to the **OASIS Open Event Terms List – Concept Guide**.

not be explicitly addressed as part of this larger situation. If the agency so chooses to address any of the individual events-of-interest, the CAP standard allows for this to be part of the <**discussion**> element (for target audiences), and as part of the <**eventCode**> element (for processing agents. See <**eventCode**> element below). Consequently, the alerting agency may assign the **primary** event-of-interest to be the complex-event knowing that this messaging option is available for all the individual events-of-interest in **CAP** [49].

2) **Element: <eventCode>** cap.alertInfo.eventCode.group (optional).
This is an added element that is optional in CAP. A CAP message with no <**eventCode**> element is still valid CAP.

**Definition (CAP v1.2):** A system-specific code identifying an **event-type** for the alert message.

**Objective:** The objective of the <**eventCode**> group is to assist consuming agents when making processing decisions based on the type of event that the originating agents designate as the **subject event** for the alert messages.

a. **Sub-element: <eventCode>.<valueName>**
cap.alertInfo.eventCode.valueName.text (required).
This is a conditionally required element in CAP. An <**eventCode**> element group in CAP with no <valueName> sub-element is an invalid group.

**Objective**: The objective of the <**eventCode**>.<**valueName**> element is to reference the managed set of event-type codes in use when populating the corresponding <**eventCode**>.<**value**> element within the group.

b. **Sub-element: <eventCode>.<value>**
cap.alertInfo.eventCode.value.code (required).
This is a conditionally required element in CAP. An <**eventCode**> element group in CAP with no <value> sub-element is an invalid group.

**Objective**: The objective of the **<eventCode>.<value>** element is to indicate to the consumer of the CAP message the chosen code in use within the group. The value is from the referenced **<eventCode>.<valueName>** set of event-type codes.

[49] See the relevant examples in the later **Example Situations** section on how this is done.

c. The **<eventCode>** group element is defined as a multi-instanced group element in a CAP message [50]. The alerting agency may optionally build none, one, or several **<eventCode>** element groups in a **CAP** message using values from one or several sets of standardized and managed event codes.

   i. In a zero instance case, with no <**eventCode**> group element, the **OASIS Open EMTC** recommends that such a case be best left for closed systems where the originator and consumer are both part of the same closed system. In open systems, where the originator and consumer are often unknown to each other, the zero case still allows for consuming system processing, however, it often leads to simpler presentations without any event-based controls. Consuming systems may interrogate less reliable elements for clues about the event-type, such as the loosely defined <**event**> element, however, the **OASIS Open EMTC** considers the results to be less reliable.

   ii. In a single instance case, with only one <**eventCode**> group element, the originating systems would be limiting the advantage of the <**eventCode**> element to consumers that use the referenced event-type set. The **OASIS Open EMTC** recommends that in the single instance case, the set referenced is the **OASIS Open Event Terms List.**

   iii. In a multi-instanced case, with two or more **<eventCode>** group elements, the elements within each group are each considered independent groups to processed separately. There may be single codes from two or more referenced sets of event codes, or multiple codes from a single referenced set of event codes, or, if the situation suggests, multiple codes from several referenced sets [51].

d. If there is a complex-event situation, the **OASIS Open EMTC** recommends that for maximum flexibility of all consuming agents, all the applicable codes from all the referenced sets in use by the agency be added to the CAP message [52]. In such

[50] An element is considered multi-instance if a data standard allows for more than one instance of the element in a single data file. The **OASIS Open** recommendation is that as many as applicable **OASIS Open Event Terms List** <**eventCode**> instances should appear in a **CAP** message, however, it is notable that many alerting agencies at the time of this writing put in no instances, or only put in one instance, even if two or more are apparent.

[51] Refer to the **Baseline Case** example in this guide for an example of just this case.

[52] See the **Example Situations** section for discussion on multiple <**eventCode**> element usage. Also see the **OASIS Open Alerting Practices** family of resources for a discussion on the advantages of multi-instanced elements.

cases, the **OASIS Open EMTC** recommends listing the **primary** event-of-interest type first.

e. The <**eventCode**>.**<value>** may be displayed by consuming agencies as provided or incorporated into a presentation that includes the value (e.g. "Event code: ***<eventCode>.<value>***"). However, it is considered a value primarily designed for agents along the path of distribution to make decisions rather than for direct presentation to the final audience.

    i. If the target audience is emergency services personnel responding to the alert message by providing follow-on services, the <**eventCode**>.<**value**> itself may hold significance in that presentation.

**3) Element: <category>**: cap.alertInfo.category.code (required).
This is a basic element that is required in CAP. A CAP message with no **<category>** element is an invalid CAP message.

**Definition (CAP v1.2):** The code denoting the category (or categories) of the subject event of the alert message.

**Objective:** The objective of the <**category**> element is to assist consuming agents in making clear processing decisions based on one or more standard CAP <**category**> values. These values are selected from an enumerated set of allowable options as defined by the CAP standard for this element.

a. With the expectation that categories are appropriately assigned based on the event situation, the <**category**> element's value is intended to provide immediate filtering context for consuming agents. This helps them process or redirect the message effectively along the path of distribution.

b. The <**category**> element is designed as a multi-instance element within a CAP message. The alerting agency has the option to include one or more <**category**> elements as needed.

    i. In cases where only a single instance of the <**category**> element is used, despite the situation containing multiple applicable options, the originating systems may be restricting the intended advantage of the <**category**> element as defined.

ii. In a multi-instance scenario where two or more <**category**> elements are included, each value is treated as an independent entity to be processed separately. The **OASIS Open EMTC** recommends adopting the multiple <**category**> approach to maximize flexibility for consuming agents [53].

c. If a complex-event situation involves multiple event types, multiple <**category**> instances should be used to list all relevant categories contributing to the broader situation. When multiple <**category**> groups are necessary, the **OASIS Open EMTC** recommends listing the **primary** event-of-interest categories first [54].

d. A default set of one or more associated CAP <**category**> values should be pre-assigned for all business **event-types** during the research and science stage of **event-type** development. These values should be filed as part of the event-type information. The **OASIS Open EMTC** advises against selecting event-type CAP <category> values during the alerting process (i.e. on the fly), as this approach may lead to varied interpretations among agents and clients, potentially compromising the integrity of the agency's alerting service over time.

i. The <**category**> element is determined locally by selecting one or more enumerated values from the CAP standard or choosing matching event-term entries from the **OASIS Open Event Terms List** [55].

ii. One option is to include all categories as listed in the mapping. However, since the **OASIS Open Event Terms List – Lookup Table** is also accessible to consuming agents, they can independently use the given <**eventCode**> value to look up all **OASIS Open** assigned CAP <**category**> values if they choose to do so.

iii. Consuming agencies, along with their clients, can establish customized arrangements to incorporate a CAP category into their partnership, ensuring clients receive services tailored to their preferences. For example, an agency may choose to add the CAP category "Safety" to an

[53] See the **Example Situations** section for discussion on multiple <**category**> element usage. Also see the **OASIS Open Alerting Practices and Strategies** family of resources for a discussion on the advantages of multi-instanced elements.

[54] For further discussion, refer to the advanced section within the following **baseline case** example situation.

[55] The OASIS Open CAP Category values were determined by committee and are not considered absolute. This process is ongoing and subject to change, primarily through user-suggested additions and mappings for each entry rather than the removal of existing values. For more details, see the **OASIS Open Event Terms List – Lookup Table** and the section on User Submitted Content.

**OASIS Open** event term, even if **OASIS Open** does not include "Safety" among its listed mappings [56].

iv. If an acceptable entry in the **OASIS Open Event Terms List** is matched, but no suitable CAP category is available (in the opinion of the alerting agency), the agency may still select other CAP Category values from the CAP standard. Additionally, the agency should consider submitting a new CAP category to the **OASIS Open EMTC** for review to accompany the identified **OASIS Open** event term [57].

**4) Element: <headline>**: cap.alertInfo.headline (optional).
This is an added element that is optional in CAP. A CAP message with no <**headline**> element is still valid CAP.

**Definition (CAP v1.2):** The text headline of the alert message.

**Objective:** The objective of the <**headline**> element is to assist consuming agents in introducing the alert message to audiences. It provides a brief, concise summary with the most relevant details to ensure quick comprehension.

a. The alerting agency should construct the CAP <**headline**> element, as well as other audience-facing text-based CAP message elements (e.g., <**description**> and <**instruction**>), using their local event term naming label (in their operating language), to represent the broader event-type situation. Additionally, any relevant details from the larger alerting situation that enhance clarity may be included in a concise, attention-grabbing statement. The <headline> should motivate the audience to explore the full alert message for further information.

[56] "Safety," as a CAP category, could theoretically be assigned to many listed event terms but is not. From the OASIS Open perspective, "Safety" is considered a consequence of various events rather than a direct indicator of the event's nature. For example, "poor visibility" is not mapped to "Safety," even though it presents a safety concern for drivers. Additionally, the CAP standard does not explicitly define what "Category" represents, leaving users to interpret its meaning based on the CAP categories provided. For further clarification, refer to the **OASIS Open Event Terms List – Lookup Table** for **OASIS Open** definitions of the CAP categories.

[57] **OASIS Open** is not an alerting agency. While significant effort has been made to assign CAP categories **to OASIS Open** Event Terms, the process remains evergreen, meaning assignments will continuously evolve and expand through user submissions over time.

5) **Element: <onset>**: cap.alertInfo.onset (optional).
This is an added element that is optional in CAP. A CAP message with no <**onset**> element is still valid CAP.

**Definition (CAP v1.2):** The expected time of the beginning of the **subject event** of the alert message.

**Objective:** The objective of the <**onset**> element is to assist consuming agents in communicating the expected start time of the subject-event within the area-of-concern to audiences.

a. If the subject-event's beginning time is unknown, or is quite varied across the area-of-concern, the <**onset**> element may be omitted from the CAP message. In such cases, the <**discussion**> element can be used to provide a descriptive explanation of the expected start time as appropriate for the situation.

b. If the subject-event involves a risk or threat event that could lead to a possible event-of-interest in the area-of-concern, the **OASIS Open EMTC** recommends omitting the optional <**onset**> element from the CAP message. Including the onset of the risk event could mistakenly be interpreted as the onset of the actual event-of-interest that the risk event is attempting to reference [58].

6) **Element: <parameter>**: cap.alertInfo.parameter.group (optional).
This is an added element that is optional in CAP. A CAP message with no <**parameter**> element is still valid CAP.

**Definition (CAP v1.2):** A system-specific additional parameter associated with the alert message.

**Objective:** The objective of the <**parameter**> group element is to assist consuming agents in processing additional, non-standardized alert message information that originating agencies wish to convey. This additional information may be **event-based** or **event-type-based** and can serve either as **display-based**, audience-facing content or as **decision-based**, agent-facing data - or both [59].

[58] Refer to the Risk and Threat section of the **OASIS Open Event Terms List – Concept Guide** for further details on the onset of risk and threat events.
[59] Refer to the **OASIS Open Alerting Practices and Strategies** family of resources for further details on the <**parameter**> element.

a. **Sub-element: <parameter>.<valueName>**
cap.alertInfo.parameter.valueName.text (required).
This is a conditionally required element in CAP. An <**parameter**> element group in CAP with no <valueName> sub-element is an invalid group.

**Objective**: The objective of the <**parameter**>.<**valueName**> element is to provide an assigned naming reference for the information contained in the corresponding <**parameter**>.<**value**> element within the group.

b. **Sub-element: <parameter><value>**
cap.alertInfo.parameter.value.text (required).
This is a conditionally required element in CAP. A <**parameter**> element group in CAP with no <value> sub-element is an invalid group.

**Objective**: The objective of the **<parameter>.<value>** element is to indicate to the consumer of the CAP message the chosen value for the additional, non-standardized alert message information within the group.

c. The **<parameter>** group element is defined as a multi-instanced group element in a CAP message. The alerting agency may optionally build none, one, or several **<parameter>** element groups in a **CAP** message providing values for as many additional, non-standardized alert message pieces of information as desired.

**7) Element: <effective>** cap.alertInfo.effective.time (optional).
This is an added element that is optional in CAP. A CAP message with no <**effective**> element is still valid CAP.

**Definition (CAP v1.2):** The effective time of the information of the alert message.

**Objective:** The objective of the <**effective**> element is to assist consuming agents in determining when the presentation of the information within the alert message should begin. The begin time is derived from the broader event situation, which in turn in turn is composed of the subject event and, if applicable, its lead time [60].

[60] For further details on the <**effective**> element, refer to the **OASIS Open Alerting Practices** family of resources.

a. If the alert message is intended for presentation to an audience at a future time, that moment marks when the originating agency seeks to initiate audience **awareness** of the subject event. Such larger alerting situations are primarily used for distant future events, where the beginning of the lead time period itself falls to a future point in time [61].

b. If the preferred <**effective**> time for the alerting agency has already passed, the <**effective**> element may be omitted from the CAP message, as the effective time would then be equivalent to the message's publish time. This is a common practice for update CAP messages when the subject-event is already having an impact.

**8) Element: <expires>** cap.alertInfo.expires.time (optional).
This is an added element that is optional in CAP. A CAP message with no <**expires**> element is still valid CAP.

**Definition (CAP v1.2):** The expires time of the information of the alert message.

**Objective:** The objective of the <**expires**> element is to assist consuming agents in determining when the presentation of the information within the alert message should conclude. The end time is typically based on the broader event situation, which in turn is composed of the subject event and, if applicable, its follow time [62].

a. The alerting agency fills in the optional <**expires**> element with either the anticipated end time of the larger alerting situation or the end time of the agency's current period of responsibility (at the time of publishing). This includes if the larger event situation extends beyond that expires point. Typically, for short-duration events, the overall situation's end time aligns with the conclusion of the event-of-interest.

b. The CAP standard permits the <**expires**> element to be optionally omitted from the CAP message. However, the **OASIS Open EMTC** recommends including the <**expires**> element and assigning a value based on an alerting business policy - typically the current end time of the alerting agency's timing-of-responsibility, as determined at the time of publishing [63].

[61] For further details on lead time, refer to the **OASIS Open Event Terms List – Concept Guide**.
[62] For further details on the <**expires**> element, refer to the **OASIS Open Alerting Practices** family of resources.
[63] The business policy governing the <**expires**> element is influenced by factors beyond the event-of-interest. For further details on common <**expires**> practices, refer to the **OASIS Open Alerting Practices** family of resources (forthcoming).

i. The <**expires**> element is optional, but its absence can be concerning for consuming agents, as there is no formal directive specifying when the message presentation should end. In such cases, consuming agents must assume that the originator will eventually provide a follow-up update or cancellation message within a reasonable timeframe to address the expiration timing of the alerting signal.

ii. When an <**expires**> time is absent, consumers must assume that no network or system issue will disrupt the delivery of a follow-up message through the distribution path. To avoid appearing delinquent in the alerting process (by not removing the message presentation in a timely manner), consuming agencies and agents generally prefer originators to include an upfront <**expires**> element in all CAP messages [64]. The **OASIS Open EMTC** recommends that the <**expires**> element always be present and assigned a reasonable end time for message presentation.

iii. Originators concerned about the potential for alert messages to expire on consuming systems, before a replacement message arrives to supersede the message, should factor in a reasonable buffer time beyond the true expires time for the message information. This would be a value balanced by the alerting agency recognizing the consuming agencies desire to not have expired information be presented well after the message, and its information, has gone stale [65].

**9) Element: <incidents>** cap.alert.incidents.group (optional).
This is an added element that is optional in CAP. A CAP message with no <**incidents**> element is still valid CAP.

**Definition (CAP v1.2):** The “group listing” naming the referent incident(s) of the alert message.

**Objective:** The objective of the <**incidents**> element in a CAP message is to link the current alert message to a broader observed situation identified by a name and/or index. An alerting agency may optionally include an <**incidents**> element for cross-referencing and tracking purposes, assisting consumers in understanding the context (e.g., a named event like "Hurricane Katrina"). Identifiers may take the form of incident

[64] This is so that the responsibility for making sure the instruction to both start and stop any alerting signal is always there. It also puts the onus on the originator to make sure the path of distribution they use is reliable, as missed messages now are the responsibility of the originator.
[65] For further details on **buffer** <**expires**> time, refer to the **OASIS Open Alerting Practices** family of resources.

tracking codes assigned by different reporting agencies (e.g., AAA-001, BBB-007), allowing multiple agencies to cross-reference their incident records [66].

a. The incident naming or incident indexing practice is determined by the alerting agency as part of its organizational profile. Consumers of the originating agency's CAP messaging can then utilize the assigned value for tracking and cross-referencing purposes.

b. International naming and indexing activities for extreme events (e.g., earthquakes, volcanoes, etc.) are among the tracking considerations an alerting agency may take into account when utilizing the <**incidents**> element.

**The following element(s) (including sub-elements) outline additional OASIS Open EMTC recommendations for improving interoperability in Common Alerting Protocol (CAP) across digitally connected systems and are applicable to the event and event-type aspects of the alerting process.**

**10) Element: <code>** cap.alert.code.code (optional).

This is an added element that is optional in CAP. A CAP message with no <**code**> element is still valid CAP.

**Definition (CAP v1.2):** A code denoting special handling of the alert message.

**Objective:** The objective of the <**code**> element is to assist consuming agencies in processing special handling information that may be included in a CAP message.

a. Special handling information refers to details that go beyond the standard alerting data in a CAP message. This may include additional information layers or constrained elements as part of a profiled limitation (e.g., a maximum length for a free-form text value). Some consumers may choose to ignore special handling information so originators should treat <code> as an element that may not be relevant to all recipients. For example, a size limitation not relevant to a consumer, but indicated by an originator, can easily be ignored by the consumer.

[66] For further details on the <**incidents**> element and the standardization of index values, refer to the **OASIS Open Alerting Practices** family of resources.

b. The **<code>** element is defined as a multi-instanced element in a CAP message.

   i. The **OASIS Open EMTC** recommends that alerting agencies utilizing the **OASIS Open Event Terms List** populate at least one **<code>** element with the following value, as defined by **OASIS Open** [67]**:** **<code>layer:OASIS-Open:ETL-LT:v2.0</code>.**

      1. The **OASIS Open EMTC** classifies the **Event Terms List** as a **layer** and specifies that the term **"layer"** must be included, as demonstrated in the example.

      2. The **OASIS Open EMTC** prefers the use of a hyphen to fill in blank spaces in its name for the <**code**> element and specifies that "**OASIS-Open**" be the form of the name, as per the example, not "**OASIS Open**".

      3. The **OASIS Open EMTC** defines versions for the list and specifies that the version reference "**v2.0**" be included, as per the example.

c. Omitting or ignoring a <**code**> element does not negatively impact the **CAP** message for originators or consumers. However, when included, advanced consuming agents can process the <**code**> element and utilize it as intended. Its presence indicates that the originating agency is adhering to the rules of a "**layer**" or "**profile**" as defined by the layer or profile owner.

   i. In the **OASIS Open Event Terms List**, the layer owner is **OASIS Open**, and the special handling rules specify that at least one <**eventCode**> element must be included in the following **CAP** message. This element will contain a code value sourced from the **OASIS Open Event Terms List – Lookup Table**. Ensuring interoperability, this approach enables consumers to rely on the element and its assigned value.

[67] For further details on the <**code**> element, refer to the **OASIS Open Alerting Practices** family of resources.

### 4.1.4 CAP Consuming process

**Typical process for consuming a CAP alert message with event based information:**

This process is commonly followed by an agent, acting on behalf of an alerting agency's dissemination partner or target audience, when interpreting a **CAP** alert message. The **OASIS Open EMTC** recommends decoding the **subject-event** and broader alerting situation information in **CAP** messages according to the steps outlined below. Refer to the baseline case example situation later in this section for further details.

**The consuming agency initiates a process to consume a valid CAP file. The CAP elements outlined below are linked to the event or event-types in a CAP alert message.**

1) **Elements: <eventCode>** (optional) and/or **<category>** (required). <eventCode> is an added element that is optional in CAP. A CAP message with no <**eventCode**> element is still valid CAP. <category> is an element required in CAP. A CAP message with no <**category**> element is invalid CAP.

   **Objective:** If any **event-based** filtering or routing of the CAP message is to be undertaken, the **<eventCode>** element (if populated) and the **<category>** element (as populated), are recommended as the two **event type-based** elements to use for this purpose [68].

   a. The filter and routing process can follow either an inclusive or exclusive approach.

      i. An inclusive filter identifies at least one event code and/or category value that matches the CAP event codes and categories relevant to the consumer [69].

      ii. An exclusive filter seeks to exclude event codes and CAP categories that are not relevant to the consumer [70].

[68] Event-based filtering and routing are actions that typically occur after filtering and routing actions based on an alerting agency's <**identifier**> and/or <**senderName**> are processed. Additional filtering and routing based on other elements are also possible. For more information on message filtering and routing, refer to the **OASIS Open Alerting Practices** family of resources.

[69] If an inclusive filter is used, newly added terms of interest in standard event code lists will not be **filtered in** unless the filtering process is updated to incorporate these new entries.

[70] If an exclusive filter is used, newly added terms not of interest added to standard event code lists would miss not be **filtered out** unless the filtering process is updated to incorporate these new entries.

iii. The **OASIS Open EMTC** recommends adopting the inclusive filter approach [71].

b. The "**at least one**" strategy applies when a **CAP** message includes multiple event codes and categories. In scenarios where two or more events of interest are present - one related to the condition of the event (e.g., flood) and another to its impact (e.g., evacuation) - the consumer can match either event independently or both as part of their operational process. For further discussion on this strategy, refer to the advanced section of the baseline case example situation.

c. The **OASIS Open EMTC** recommends a configurable lookup table approach, allowing the list of inclusive event types to be updated as needed without modifying the processing software. If the processing software dynamically references this list for each new incoming **CAP** alert message, the list can be updated and implemented separately without impacting the message processing system.

d. As an advanced processing method, a consuming agent can retrieve <**eventCode**> element values and cross-reference them with corresponding **OASIS Open** CAP Category(s) from the **OASIS Event Terms List**. The resulting category list can then be used to augment the existing **CAP** Category values within the **CAP** message. This expanded list of **CAP** Categories has the potential to increase the scope of an inclusive filtering process [72].

2) **Element: <event>** (required).
This is a basic element that is required in CAP. A CAP message with no <event> element is an invalid CAP message.

**Objective:** If the <**event**> element is utilized by a CAP consuming agency in a presentation, it should clearly convey its value as an event type, rather than an actual event. For example, it should be displayed as “Event type: <**event**>” instead of “Event: <**event**>”. The preferred messaging should emphasize that “an alert has been issued for an event of type X”, rather than “an alert has been issued for event X”.

a. A key benefit of this approach is its applicability to both condition-based and impact-based events. It helps convey impact-based events more clearly, reducing potential confusion. For example, presenting “**Event type: emergency**” is

[71] For more information, refer to the **OASIS Open Alerting Practices** family of resources.
[72] Consumer filtering based on <**eventCode**> or <**category**> in an incoming message requires trust that the originating agency has properly considered the <**category**> element. The inclusion of the <**code**> element serves as a tangible verification of this consideration, reinforcing consumer confidence in the originator.

generally better understood in the social science of alerting than "**Event: emergency**".

3) **Element: <headline>** (optional).
This is an added element that is optional in CAP. A CAP message with no <headline> element is still valid CAP.

**Objective:** The CAP consuming agency should present the CAP originator's <**headline**> element as provided. While constructing a custom headline is not an **OASIS Open EMTC** recommended practice, OASIS Open acknowledges that some consuming agencies may lack presentation systems capable of accommodating all CAP <**headline**> elements. In such cases, creating a custom headline may be necessary [73].

a. If <headline> is present in the CAP message, the **OASIS Open EMTC** recommends presenting it as is, ensuring it reflects the preference of the originating alerting agency. For example, displaying "Headline: <**headline**>" is preferred, though presenting "<**headline**>" alone is also common and considered acceptable.

b. If the <**headline**> element is omitted, an alternative presentation may still be effective. However, the **OASIS Open EMTC** strongly recommends displaying at least the <**event**> element in such cases (e.g., "**Event type: emergency**").

4) **Element: <parameter>**

**Objective:** A **CAP** consuming agency may choose to process <**parameter**> group elements, which are optional and may contain customized information related to the event and event types included in the alert message. The format of this customized information layer is defined by the alerting agency and can take various forms, including freeform text [74].

5) **Element: <incidents>**

**Objective:** A **CAP** consuming agency may opt to process the <**incidents**> element. This optional element can include information about related events-of-interest and messages, indexed via a provided incident name or code. [75].

[73] For more information on <**headline>**, refer to the **OASIS Open Alerting Practices** family of resources (forthcoming).
[74] For more information on <**parameter**>, refer to the **OASIS Open Alerting Practices** family of resources (forthcoming).
[75] For more information on <**incidents**>, refer to the **OASIS Open Alerting Practices** family of resources. (forthcoming).

**The following element(s) (including sub-elements) outline additional OASIS Open EMTC recommendations for improving interoperability in Common Alerting Protocol (CAP) across digitally connected systems and are applicable to the event and event-type aspects of the alerting process.**

1) **Element: <code>** cap.alert.code.code (optional).
   This is an added element that is optional in CAP. A CAP message with no <**code**> element is still valid CAP.

   **Objective:** A **CAP** consuming agency may optionally process any <**code**> element in a **CAP** message. A <**code**> value, such as **<code>layer:OASIS-Open:ETL-LT:v2.0</code>,** serves as a **courtesy element** within CAP, signaling to the consumer that the message contains a layer of event-based information related to the published **OASIS Open Event Terms List**. The <**code**> element is designed to enhance processing integrity for advanced consuming systems [76].

   a. While the **CAP originator** constructs the CAP alert message, the **format and structure rules** of the <**code**> element instance are determined by the **layer owner** - in this case **OASIS Open** for the **OASIS Open Event Terms List.**

      i. The value between the opening and closing <**code**> tags is a single string that should ideally be processed and matched in its entirety. The matching string incorporates the colon delimiter, the "layer" designation, **OASIS Open** as the owner, the **OASIS Open** lookup table reference, and its version number. For the **OASIS Open Event Terms List – Lookup Table v2.0**, the standardized format is: **"layer:OASIS-Open:ETL-LT:v2.0".**

      ii. The four fields within the value serve as **courtesy fields** to help consuming agents and agencies understand the **OASIS Open reference** provided. Processing these fields individually is **not an expected activity** in an operational environment.

[76] See the **OASIS Open Alerting Practices** family of resources for more on <**code**> (forthcoming).

## 4.2 Baseline Case

The baseline case example situation outlined here serves as the universal reference model for all subsequent examples provided in the ***Example Situations*** section. Unless explicitly stated, the principles outlined in this baseline case will apply across all additional scenarios. Subsequent analyses of the additional scenarios will focus on how each case diverges from the baseline case, shedding light on their unique elements.

The **baseline case** begins with the **observing process**, progresses through various stages, and concludes with the **CAP consuming process**. Each section will introduce a list of relevant terms for the process, followed by discussions at increasing levels of complexity - starting with a **simple analysis**, then advancing to a **more detailed analysis**, and finally concluding with a **fully advanced analysis** on the larger alerting situation.

The **example situation** is a complex-event case categorized as **advanced**. The **simple discussion** presents the case as a straightforward basic alerting scenario, while the **more advanced** and **fully advanced** discussions explore a more **comprehensive approach**. These discussions involve numerous **decisions** based on the **inter-relationships** among the various observed events that collectively shape this **complex-event advanced situation**

The various **observed events** in the baseline case are **interdependent** within the broader context. And even though each event could be managed separately with individual alerts, the example also demonstrates how they can be **combined** into a single **complex-event situation** and handled through a **single** complex-event alert. The discussion offered here examples how **CAP features** are designed to manage both **single** and **complex-event situations**.

Determining whether to handle the overall event situation as a **series** of **single events**, each with its own alert, or as **one complex-event situation** within a **single alert,** falls to the **purview of an alerting agency**. Some may opt for the **complex-event approach,** using a single alert attempting to reduce the situation down to one **larger alerting situation** (in efforts to minimize the number of **active alert messages** in play); while others may opt for several **single-event approaches,** handling each with its own alerting situation (with overlapping active messages).

### 4.2.1 Example Situation - Flash Flood

In this **constructed,** baseline-case example situation, a **public agency** has been alerted to a **rapidly rising water levels** event within its **area of responsibility**. Water gauge sensors indicate that water levels are increasing at a rate exceeding the **pre-determined threshold** for a **flash flood.** Furthermore, the **hard-set level marker** for rate of increase of water levels, and the volume of water contributing the rise, is sufficient for a follow-on **flood** event to also be realized.

Recent records indicate that water levels were **normal** (not high) before the onset of this event situation. Additionally, a quick check confirmed that a **broken levee** at the **county reservoir** is what is causing the **large volumes of water** to spill into an **area of concern**. High degree of certainty observations strongly support that a **flooding situation** is actively unfolding [77].

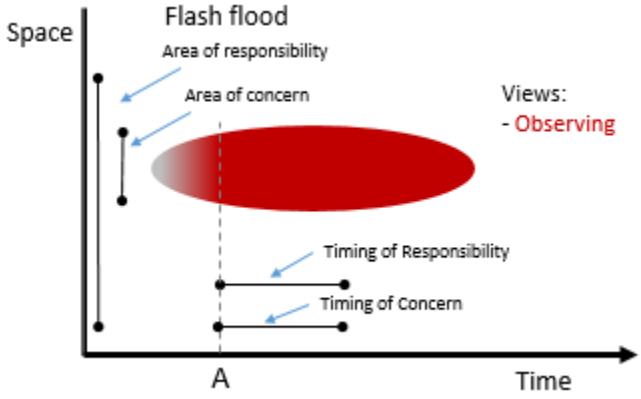
### 4.2.2 Observing Process

**Observed events:** flash flood, rainfall, levee collapse**,** flood
**Event-of-interest:** flash flood, flood
**Secondary events:** rainfall, levee collapse, flash flood, flood, evacuation

**Simple Observation:**

1) 1) A **flash flood** situation is observed, with several key observations noted regarding the fast-rising water levels:

    a. The event is recognized and found to be **real** and **occurring** within a portion of the alerting agency's **area-of-responsibility** at point-in-time A.




[77] Every situation is unique. This constructed example is specifically designed to highlight certain key discussion points, while acknowledging that numerous "what if" scenarios could be introduced - each potentially altering the situation in significant ways.

b. The left edge of the grey filled area on the left side of the marked event is when the event is acknowledged to have started, even though it wasn't observed immediately at that point-in-time (it is the time at which the broken levee occurred, i.e. the trigger event for the flash flood resulting in immediate impacts).

c. The red filled area is when the event became interesting to the various observing parties (when it came to be noticed by the various alerting agencies involved). The red filled area covers the grey filled area completely, except for a short beginning period. These two devised and formed events, the event (grey) and the event-of-interest (red), are constructs identical in nature, impacts, location and timing except for the beginning timing of when they started [78].

d. The rising water levels are observed to **exceed** the pre-determined **threshold** for a flash flood event.

e. The location of concern covers only a **portion** of the agency's area of responsibility.

f. The situation is promptly designated as a **"flash flood" event-of-interest**, as the term **flash flood** most accurately describes the circumstances at the time of observation. This classification is based on the **history** and **social science** conclusions of "flash flood" being the appropriate term.

2) The **area of concern** for the **flash flood** is straightforward to determine in this baseline case. The flash flood event had a **known start time**, based on **recorded observations**, and its **end time** can be **estimated,** using **scientific predictions** and **historical data** from similar past events.

a. The affected **area** is a **single, low-lying location** that is **known to be vulnerable** to flash flood events. The **outer edge fringe areas** surrounding this location will experience a **reduced level of impact** compared to the **inner core areas**.

b. The **duration** of the **flash flood situation** is closely aligning with predictions from a **modeled course**. Since the **rainfall event has ended**, no additional water is being introduced, reinforcing the accuracy of the forecasted timeline.

[78] After the fact, it is acknowledged that the actual event started at some point-in-time and the alerting agency event of observing it with interest started shortly after that.

c. The **flash flood-prone area** represents a **zone** requiring an **alert**. This area includes the currently rising water areas and the soon to be rising water areas, as the floodwaters continue to **spread (westward** from the **Highway 1 East levee breach** in the **eastern part of the county)**.

3) Additional events in the event situation include a **rainfall event**, a **levee collapse event**, and a **flood event**. These are summarily classified as **past and future secondary events**.

a. The **rainfall** and **levee collapse** events are past events that provide **background context** to explain the unfolding **flash flood** event. As such, they are **no longer relevant** going forward to the ongoing observing process.

b. The **flood event** is a **future event**, designated as a second **event-of-interest.** In a simple **alerting process**, it is to be addressed separately in the future with its **own alerting process**. The alerting agency will begin the separate flood event-of-interest process immediately after the flash flood event-of-interest process is addressed. The near term future flood event is an associated secondary event-of-interest to the flash flood event - one needing immediate attention in turn after the flash flood [79].

4) Based on **history, research, scientific understanding, and conventional wisdom**, flash floods are widely recognized as **high-impact events**. Given this, the **analysis** of the unfolding and real **flash flood** situation commences immediately.

[79] The alerting agency, in this example case, has a separate process for flash flood and flood events. The observing process could even be automated. Nevertheless, the result is the flash flood event is being dealt with ahead of the flood event.

**More Advanced Observation:**

1) In this more advanced approach, the alerting agency plans to combine two events-of-interest into one **complex-event** situation to be handled in one alerting situation.

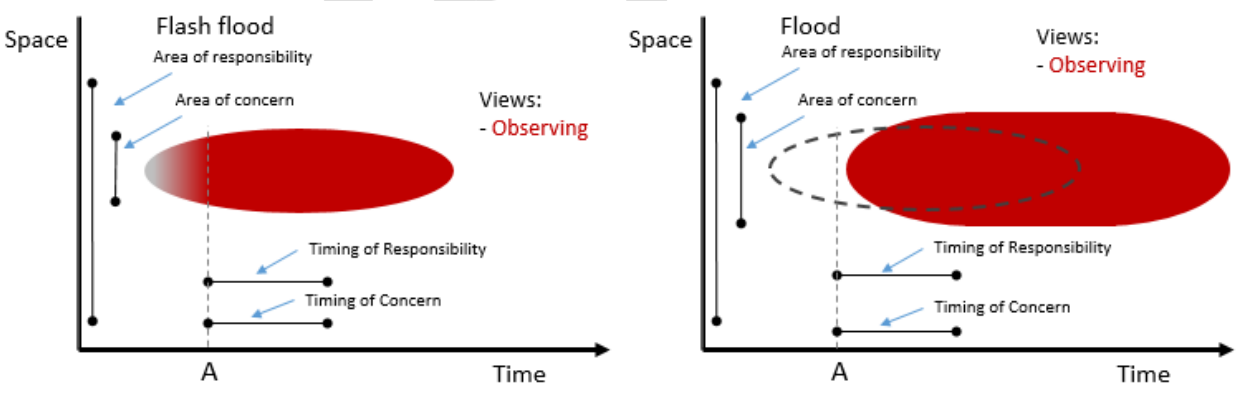
    a. In addition to bullet 1 in the initial **simple observation** above, further key observations are noted.

        i. The **volume of water** involved, combined with the **elevation** profile of the flash flood **area of concern**, will result in a flood event over a **larger area**.

            1. The flood observing process happens **concurrently** with the flash flood observing process.

            2. As the high water area continues to spread, its **rate of rise** will decrease, reducing the flash flood concern sooner than flood concern.

    b. The **flash flood event** is **real** and **occurring** within a portion of the alerting agency's **area-of-responsibility** at point-in-time A. In contrast, the **flood event** is **imagined** and anticipated. While these two events are **independent**, they are both part of a **larger event situation** sharing many of the same measurable conditions. Each event has its own **criteria for existence**, as well as distinct **areas** and **timing** of concern.




    c. The **fast-rising water event**, actively occurring within the **area of concern**, serves as **antecedent** conditions for the predicted **flood event**. Given the established **rising water levels condition**, the forecasted **flood event** is classified as having **high certainty**.

d. The **collapsed levee** is a **separate event** within the **larger event situation** and is being handled by **another agency**. This other event has the potential to **impact the duration** of both the **flash flood** and **flood events.**

    i. If the levee break is **addressed in a timely manner**, it may shorten the timing of the two flood based events. The **collapsed levee** is recognized as a **standalone situation** and serves as the "**incident" event** within the broader event situation. The broken levee **responding agency**, in this baseline case, has officially designated a name for the levee "**incident",** the **"Highway 1 East Levee Collapse"** incident.

e. The **preceding rainfall event**, occurring before the **levee collapse**, was responsible for **elevating water levels** in the **reservoir** beyond normal levels. This increased water volume will further **intensify** the overall **event situation**. While the **rainfall event** could arguably be classified as the overall **trigger event**, and thus the **primary "incident"** to use, rainfall events are **common occurrences**, whereas the **levee collapse** is an **exceptional occurrence**. Given this distinction, the **levee collapse** serves as the **most appropriate incident identifier** for the overall event situation.

2) Building on the **simple observation** section above, at the current **point-in-time A in the diagrams**, the **flash flood** event is the **most immediate concern**. However, as the event situation progresses, the **follow-on flood event** will eventually **become the main concern**, shifting the **primary** event-of-interest from a **flash flood** to a **flood**. This situation involves at least **two events-of-interest**, indicating that it qualifies as a **complex-event situation** [80].

    a. A **judgment call** is made in this situation, determining whether the **responsible agency** is losing significant advance warning time while concurrently assessing **both** flood-based **events-of-interest**. If the **observation-gathering process** for the **flood event** begins to **delay the timely publication** of an alert for the **flash flood event**, the agency may opt to **proceed** with issuing a **flash flood alert** first, with the understanding that it will quickly by an **updated message** covering **both the flash flood and flood events**. This will be determined in the analysis process to follow.

        i. Preliminary messages often overdo the area and timing of concern in the haste to get them published, a behavior that can be acknowledged with standard text indicating new messages will be issued with additional details as they become available.

[80] There could be many more, however for this example, these are the only two events-of-interest addressed.

3) If the **flash flood** were to trigger additional **secondary events**, such as **structural damage** to a **bridge,** or a **building collapse concern**, the overall **complex-event** situation would be evolving. However, in this **baseline case example situation**, the scenario is intentionally kept minimal, with no such additional events to consider.

4) In addition to bullet 2 in the simple observation section above, the **area of concern** for the **flood events** is also straightforward to determine in this baseline case.

    a. The affected **area** is a **single, low-lying location** that is **known to be vulnerable** to flood events. The **outer edge fringe areas** surrounding this location will experience a **reduced level of impact** compared to the **inner core areas**.

    b. The duration of the flood event is less certain than the flash flood due to it's much longer future-time presence, as there is still a period of high water levels expected after the rising water nature ends.

    c. The **flood-prone area** represents a **zone** requiring an **alert**. The **low-lying flood-prone area** is a larger area as illustrated in the diagram.

5) The **trigger event** for the overall **event situation** could reasonably be attributed to either the **rainfall event**, which **caused the levee collapse**, or the **levee collapse itself**, potentially due to **structural failure**. However, at this stage, the **trigger event information** primarily serves as **historical context** for understanding the broader situation. The **focus** is now shifting to the **alerting process moving forward**.

    a. Reporting the **trigger event** is optional and depends on the **alerting agency's discretion**. Including it could either **complicate the narrative** or help **explain the situation quickly and concisely**. The agency may choose to **introduce the trigger event** in its **initial messaging** to establish context, and then **omit it in later updates** as the alerting situation evolves.

6) In addition to **bullet 4** in the **simple observation above**, historical data, research, scientific analysis, and conventional wisdom indicate that **floods** are also **high-impact events**. Given this, a **detailed analysis** of the **flood situation** can now begin, along with coordinated **communication** between **agencies** to ensure an effective response.

7) The two events-of-interest as a group, the flash flood and the flood, are considered related events of type "**aggregation**" [81].

   a. Relationship types of **aggregation** are neither the weakest nor the strongest type of relationships. Discussing either flood-based event-of-interest in isolation, may bring to mind the other events-of-interest, as they are closely related by event-type and the observed conditions.

   b. This relationship type is a preliminary assessment done in the observation process. This assessment could change in the analysis process to follow. For now, knowing this relationship type is in play, both events should be mentioned and passed on for analysis with full reference to each other.



[81] Event relationship types, of which there are three classified by **OASIS Open**, are not critical to the effectiveness of the alert signaling service, however, they are helpful in understanding the social science of the event situation and can help build a structured information service given the target audience. Refer to the **OASIS Open Event Terms List – Concept Guide** for more discussion on event **relationship** types.

**Fully Advanced Observation:**

1) In this fully advanced approach, the alerting agency plans to combine three events-of-interest, including the creation of a new one, an evacuation event-of-interest, all grouped into one **complex-event** situation [82].

    a. Further to **bullet 1** in the **more advanced observation section** above, additional aspects of the **overall event situation** are identified [83].

        i. The **affected population** has **limited recent experience** with such flood based events, as the last occurrence took place **over 15 years ago**. This lack of familiarity may impact **preparedness** and **response effectiveness**.

        ii. There has been **little to no public discussion** regarding the condition of the **Highway 1 East levee** for nearly the **same duration** - about **15 years**. As a result, the **levee failure** came as a **surprising and unexpected event** to the affected community.

        iii. An **evacuation order** may be considered as a **necessary action** given the unfolding event situation. It has its own **criteria for existence**, as well as distinct **areas** and **timing** of concern.

            1. Due to the **population density** of the affected area, any **evacuation effort** could lead to **severe congestion** at critical travel routes, potentially complicating emergency response and safety measures.

            2. Highway 1 East is not a **viable** route for evacuation. Information on viable evacuation routes would be helpful in the messaging, if such information were pre-determined and stored with an event-type relevant to the situation.

2) In addition to **bullet 2** in the **more advanced observation section**, considerations regarding an **immediate evacuation** are also incorporated into the thinking of the observation process.

[82] Note that in the analysis stage, a fourth event-of-interest is added. At the observation stage, this fourth event-of-interest has yet to be conceived.

[83] Observing all the **events-of-interest** in the **fully advanced situation** requires added expertise and training of the agents responsible for such tasks as such situations often require adapting to a rapidly changing situation as it unfolds.

3) In addition to **bullet 6** in the **more advanced observation above**, historical data, research, scientific analysis, and conventional wisdom indicate that **evacuations** are **high-impact events** requiring significant coordination between emergency services agencies and personnel. Given this, a **detailed analysis** of the **imagined evacuation event** can now begin.

4) In addition to **bullet 7** in the **more advanced observation above**, the three events-of-interest as a group, the flash flood, the flood, and the evacuation, are considered related events of type "**association**". The two flood events, as its own group, are considered related events of type "**aggregation**", however, the addition of the third event-of-interest puts them all into a different relationship type "**association**".

    a. Relationship types of **association** are the weakest relationships. An evacuation event-of-interest does not immediately bring to mind the flood based events-of-interest in the event situation. An evacuation event could be triggered by many events not flood-based. In this baseline case, they are only related by the observed conditions.

        i. Knowing this, the flood-based events, in this baseline case, need to be explicitly mentioned and discussed separately in the observing process.

    b. This relationship type is a preliminary assessment done in the observation process. This assessment could change in the analysis process to follow. For now, knowing this relationship type is in play, all events should be mentioned and passed on for analysis with full reference to each other.

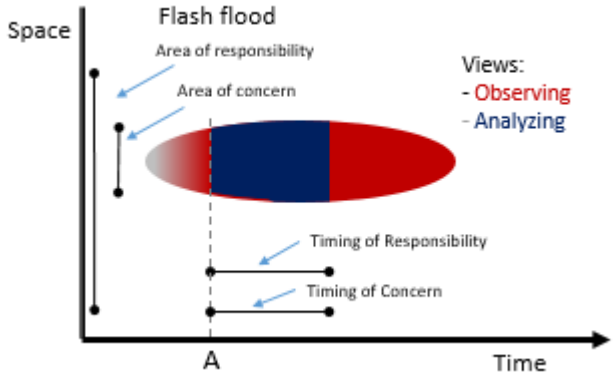
### 4.2.3 Analyzing Process

**Primary events-of-interest**: flash flood, flood, evacuation
**Secondary events:** rainfall, levee collapse, flash flood, flood, water barrier operations, evacuation, road closure
**Alert-worthy Events:** flash flood, flood, evacuation, emergency
**Trigger events:** rainfall, levee collapse
**Primary Event type:** flash flood, flood, evacuation, emergency
**Secondary Event Types:** rainfall, levee collapse, flash flood, flood, deployment of emergency services, evacuation, road closure
**Subject event**: flash flood, flood, evacuation, emergency

**Simple Analysis:**

1) Beyond what was captured in the **observing process**, the **analyzing process** identifies additional insights, including:

    a. Confirmation that the **flash flood event** (grey) is a truly a devised and formed event-of-interest (red), that does lead to a devised and formed **alert-worthy event** (blue).




    b. In this case, the primary difference between the **event-of-interest** and the **alert-worthy event** is the timing of the two event constructs. The alert-worthy event is constrained to the here and now for the client, relative to point-in-time A, and its worthiness ends when the timing-of-concern ends, again relative to point-in-time A. The **event-of-interest** construct has no such constraints, as its entire existence is of interest to the business [84].

[84] This approach is simply devising and forming the **event-of-interest** for the alerting agency and devising and forming the **alert-worthy** event to the alerting audience. It is the alert-worthy event's nature, impacts, location and timing that will be what the alerting agency focusses on at point-in-time A. Refer to the **OASIS Open Event Terms List – Concept Guide** for more discussion on the **area** and **timing-of-responsibility**.

c. Analysis confirms the secondary **flood event** is also a truly devised and formed event-of-interest, leading to a devised and formed alert-worthy event. The simple **analysis** also confirms it can be addressed separately after the **flash flood alert** has been **issued and published**. In this **baseline case**, the **flood event analysis** would begin **immediately after** the **flash flood analysis** due to its **rapidly developing and high impact nature** [85].

d. The **other agency** responsible for addressing the **levee collapse** has initiated a **"deployment of emergency services" event**. The **simple analysis** here confirms that this other event remains a **separate event**, however, it may be worth a mention.

2) The **analysis** confirms the alert-worthy **area of concern** for the client completely matches with the flash flood **event-of-interest** area. Although they match, this newly defined area construct is assigned to the **alert-worthy event area** in the **alerting process**. The alert-worthy event area is used to ensure focused communication and response efforts are directed to that area. For other event-type situations, matching areas may not be the case.

a. The **analysis** acknowledges that the **full extent** of the **area of concern** for the **flash flood event-of-interest** is based on a **prediction**. As conditions evolve and predictions change, **updated alert messages** will be able to **reflect any changes** to the area of concern, ensuring focused communication and response efforts remain appropriate to the situation.

b. The **scope of analysis** also determines a **set of flash flood based impacts** directly resulting from the **fast-rising water levels**. This would be extracted from the flash flood event-type information stored on hand, and as constrained by the alert-worthy area of concern.

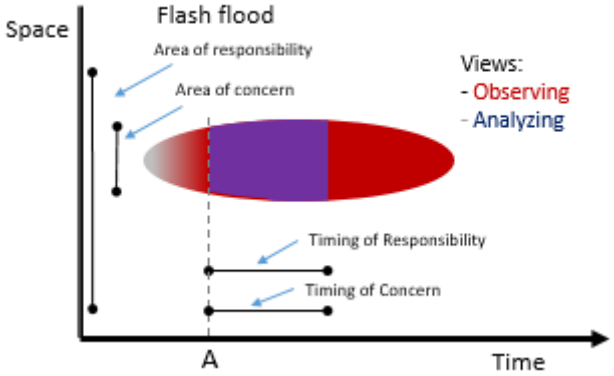
3) The **analysis** confirms the alert-worthy **timing of concern** for the client is a subset of the timing of the flood flash event-of-interest. This **timing** now serves as the **alert-worthy event timing**, and subsequently the **alert signaling process**, ensuring timely and accurate information. This timing analysis is updated frequently to keep it accurate.

a. The **response time** for impacted parties in this baseline case will be **limited**. For those located **near the collapsed levee**, its essentially zero. Given the **confirmed area** and **timing** of the **alert-worthy event**, the **urgency level** for an **alert message** is set to **immediate** to ensure as prompt action as possible of alerting partners.

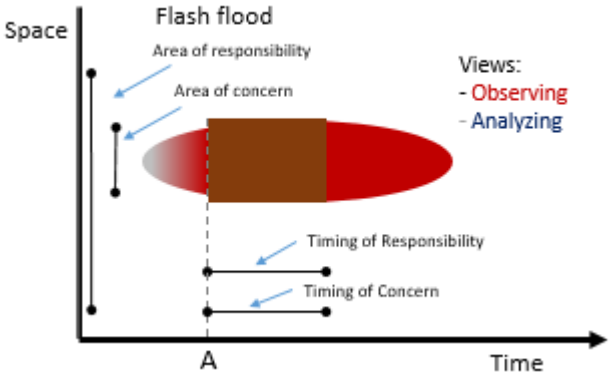
[85] The observation and analysis of events-of-interest as they happen in order, is purely for discussion purposes. If enough resources are available, such efforts could be handled simultaneously.

b. The **analysis** acknowledges that the **timing of concern** for the **flash flood event of interest** extends **far enough into the future** that its **end timing** is **not currently relevant** at the current **point-in-time A**. Future **update alert messages** will provide **timely information** regarding the **event's conclusion** well before the ending occurs.

4) As the **alert-worthy event** is to be addressed as a single-event-based alert, the **alert-worthy event** and the forthcoming devised and formed alert message **subject event** have identical nature, impacts, location and timing boundaries.




5) The **subject event** is then part of what defines the **larger alerting situation** area and timing.




a. The **larger alerting situation** is defined by the alert message, and includes a single set of begin and end times, and a single set of area references (as shown above). Both remaining fixed until a replacement message is published. In this baseline case, the **larger alerting situation** area is slightly larger than the **subject event** area. The

difference is subtle, however in some cases, it can be more. In this baseline case, some minimal edge areas at point-in-time A are over-alerted spatially [86].

6) The **analysis** confirms several key aspects of the **fast-rising water levels event.**

   a. The **current rising water levels** rate meets the **classification** of **fast-rising** as opposed to its binary compliment **not-fast-rising**. At this stage, it is designated as a **static event**, as it will remain **fast-rising** (above the rate threshold) until it is not. This fast-rising classification is expected to **persist for some time**.

   b. The **current rising water levels** event meets the **classification** of **growing-in-area** as opposed to its binary compliment **not- growing-in-area**. At this stage, it is designated as a **moving event**, as it will remain **growing** (moving and expanding in area until it is not). This classification is expected to **persist for some time**.

7) If **time permits**, the **analysis** can conclude data on **current water levels**, the **rate of rising water**, and the **currently observed extent of the affected area**. While these details are **not essential** to the **immediate alerting process**, they can be **valuable** for situational awareness and future decision-making.

8) Additional **lifecycle details** are gathered to aid in **constructing an alert**. These details include:

   a. If the flash flood alert is to **end** when the flash flood event ends (assuming a straight forward alerting process is determined by the analysis), both the **alert-worthy flash flood event** and **subject-event flash flood event** will end at the same time. The flash flood **larger alerting situation** would then be deemed as no longer existing.

9) Additional **process details** are gathered to aid in **constructing alert messages**. These details may include.

   a. **Building a polygon object** to define the **area of concern** at the time of messaging**.**

   b. **Assembling a list of proxy zones** (e.g., **county-based zones**) to represent the affected areas as per the alerting agency standard operating procedures.

[86] The spatial over-alerting conclusion here is subjective. Often some over-alerting is accepted as part of the cost of doing business due to technical constraints. Refer to the **OASIS Open Alerting Practices and Strategies – Concept Guide** for more discussion.

c. **Calculating the expiration time** for the **soon-to-be-published alert message**, based on the end timing of the **subject event** [87]. This would be either:

   i. the end time of the subject-event, if it was determined the subject-event timing of concern is earlier than the end timing-of-responsibility, or

   ii. the end timing of responsibility (as of point in time A) - a time set by **business policy** governing situations of **event-type** flash flood **[88].**

10) Since the **event of interest** and the **subject-event**, in this baseline case, are fundamentally based on the **same happening**, the **designated label** for the larger alerting situation is **"flash flood"**, as dictated by **event-type policy**.

    a. An alternative label, such as **"high water"**, could be used, but would likely **reduce the perceived urgency** of the situation. Social science suggests that **"flash flood"** is generally **more attention-grabbing**, making it a more effective term for conveying the seriousness of the **alert-worthy event** to the audience.

11) The pre-determined **business usage type** for this particular **larger alerting situation** is that of **"warning"** [89]. Long-standing **practices,** for this baseline case example, dictates that the "warning" **designation** is to be used when notifying the public about such hazardous **subject-events**. This ensures consistency of communication about such hazards over time and over multiple instances of the same hazard-type occurring.

12) The **full named alert** in this example is **"flash flood warning."** It combines the **chosen event type label** (**"flash flood"**) and the chosen **business usage type** label (**"warning"**). While other label choices exist, **long-standing practice** have established these as the standard in this baseline case example.

13) The **alert message** intended for the **audience** will incorporate **text derived** from the **actual analysis** of the observed **event of interest, the alert-worthy event,** and the resulting **subject event**. This ensures that the message is **informative, relevant, and reflective** of the ongoing situation. In this baseline case, such text would likely not change much between the various event constructs, but in some cases, especially **complex-event** cases, it could.

[87] See the **OASIS Open Event Terms List – Concept Guide** for more on <**expires**> time.
[88] In a changing situation where updated alerting messages are expected, the expires time of any alerting message is never expected to actually be reached. The message is expected to be superseded long before the expires time is encountered. Refer to the **OASIS Open Alerting Practice and Standards – Concept Guide** for more on "expires".
[89] See the **OASIS Open Event Terms List – Concept Guide** for more on event-based **named alert** information.

14) The remaining **text in the alert message** will be shaped by the understanding that the **primary event of interest** is categorized as a **flash flood**. The **history, research, scientific analysis, conventional wisdom**, and established **policies** for handling **flash flood events** will guide the **Alerting Agency** in crafting a **clear, effective, and actionable alert message**.

15) A review of the **alerting agency's event type classification** for **"flash flood"** confirms that the appropriate **CAP category** for this type of **event of interest** is **"Environmental."** This **category assignment** was determined through **business research** conducted **well before** the actual flash flood event-of-interest occurred, ensuring consistency in classification and response. The **OASIS Open** subcategory is "**terrestrial**", simply confirming that the **OASIS Open** interpretation of such events is one that is over land.

    a. Any other **available information** on the **OASIS Open Event Term "flash flood"** can now be **incorporated into the originating CAP process**, enhancing the accuracy and effectiveness of the alert and the interoperability of the **CAP** alert message.

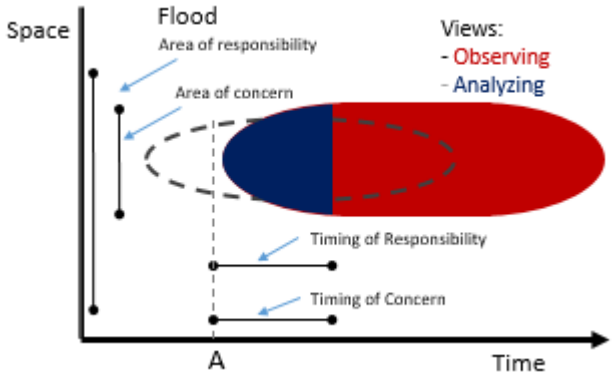
16) The **levee collapse** and **rainfall events**, as noted in the observing process, are **not directly relevant** to the current situation. However, they serve as **background information**, providing **context** for the **consuming audience** to better understand the unfolding events.

**More Advanced analysis:**

1) In this more advanced approach, the alerting agency plans to combine two events-of-interest into one **complex-event** situation to be handled in one alerting situation.

    a. Beyond what was captured in the **more advanced** section of the **observing process** and the **simple analysing process** above, the **more advanced analysis** identifies additional insights, including:

        i. Confirmation that the **flood event** (in grey – hidden) is a truly devised and formed event-of-interest (in red – partially hidden), that does lead to a second devised and formed **alert-worthy event** (blue – fully shown) [90].




        i. Like the flash flood, a difference between the flood **event-of-interest** and **alert-worthy event** is the timing of the two event constructs. Unlike the flash flood, the start time of the **flood alert-worthy event** is not the current point-in-time A.

        ii. All other points discussed in bullets 1, 2 and 3 of the simple analysis section apply **except for the decision to defer** the flood alert-worthy event to a following and separate alerting situation.

        iii. Other agencies may initiate **secondary response activities**, such as **constructing emergency water barriers** to address the concern of the advancing water, thereby impacting the location and timing details of the flash flood and flood events-of-interest.

[90] Since the flood event is imagined and anticipated, the grey representation for it is in the future and therefore completely covered by the red event-of-interest and blue alert-worthy event representations in the diagram.

2) Like bullet 2 in the simple analysis, the **analysis** confirms the alert-worthy **area of concern** for the client completely matches with the flood **event-of-interest** area.

    a. The **scope of analysis** also determines a **set of flood based impacts** directly resulting from the **high water**. This would be extracted from the flood event-type information stored on file, and as constrained by the alert-worthy area of concern.

3) Like bullet 2 in the simple analysis, the **analysis** confirms the alert-worthy **timing of concern** for the client is a subset of the timing of the flood event-of-interest.

    a. The **analysis** acknowledges that the **timing of concern** for the **flood event of interest** extends **far enough into the future** that its **end timing** is **not currently relevant** at the current **point-in-time A**. Future **update alert messages** will provide **timely information** regarding the flood **event ending** before the ending occurs.

4) The **analysis** notes that it is antecedent **rising water conditions** that will cause **water levels** to exceed the **predefined threshold** for a **flood event** at some **future point in time**, allowing for some **lead time** before the **alert-worthy flood event** begins.

    a. The **response window** for the **alerting audience** is noted to be longer for the **flood** event as compared to a **flash flood** event. The **urgency** to issue an alert is **less immediate** for the flood than the **flash flood**, making the flash flood event still the **primary** event-of-interest at point-in-time A.

    b. The **edge areas** of the flood event will **not experience** the **fast-rising water** condition of a **flash flood** due to the **gradual spread** of the rising water slowing the rate of rising in the edge areas.

    c. The **severity** of the **flood event of interest** is deemed **just as extreme** as a **flash flood**.

    d. The **depth of water** concern across the **flood-prone area** will be a **longer term concern** than the **rising water concern**, one that is expected to persist for **days**.

    e. A **new set of impacts,** those related to **high water flood levels**, is now under consideration.

5) Based on **history, research, scientific analysis, and conventional wisdom** surrounding the two events-of-interest - particularly as reflected in their **associated event types** - the most effective terms for these two **events of interest** are **“flash flood”** and **“flood.”**

6) Additional lifecycle details are gathered to aid in constructing an alert. These details include:

   a. The **named alert** can change names between the **initial** and **updated messages** in the alert message series. For example, a **"flash flood warning"** message, followed later by a **"flood warning"** message, as part of the **same continuous** set of messages associated to the single **complex-event alert.** The **OASIS Open EMTC** considers this an acceptable approach when the **flood event** overtakes the **flash flood** as the **primary event of interest** [91].

      i. If the flash flood alert is to be **updated** when the flood event takes over as the **primary** event-of-interest, the **subject event** will continue and change to the flood event (in the updated messages). At such time, the **flash flood alert-worthy event** is relegated to a secondary event to the new primary flood event. The flash flood event-of-interest may continue on, to some lesser degree, however, it has been overtaken by the flood event as the **primary** event in the event **situation**.

   b. The named alert could initially start off as "**flood warning**" and continue as "**flood warning**" throughout its series of messages, assuming the alerting agency feels the audience is capable of handling the situation this way.

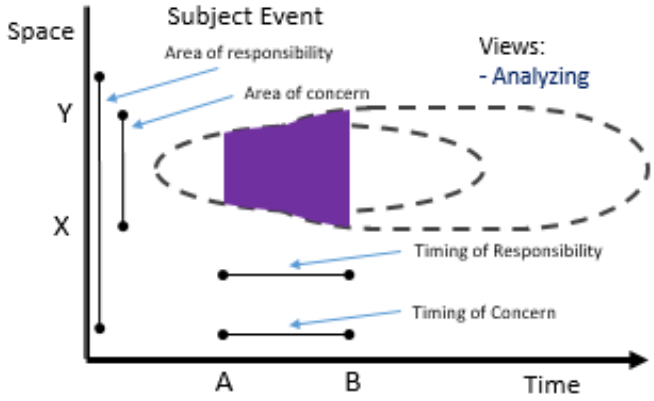
   c. A third option, "**emergency flood alert**", where the descriptive qualifier "emergency" is added to heighten the awareness to a higher level – hopefully one that will result in more immediate action.

      i. The term "emergency flood warning" is also a consideration, however, the social science of **warning** the audience to something specific, and using a general term like **emergency**, can lead to some confusion. The term **alert** is a general term that works well with **emergency**, as both these terms direct the audience to look deeper into the message for the details, with the term flood providing a quick introduction to the topic of discussion that will be given.

      ii. This is one way to use "**emergency**" - as a descriptive qualifier. Another way is to use "emergency" as an event-of-interest itself. For that approach, see the fully advanced section to follow.

[91] For further guidance on **alerting update strategies**, refer to the **OASIS Open Alerting Practices family of resources**.

7) The **condition, impacts, location, and timing** of a single **subject event,** derived off a **complex-event**, is the union of the **two alert-worthy events**, each of which were determined by their **intersection** with the **alerting agency's area and timing of responsibility,** as illustrated in the diagram below [92].




a. The area in purple is the newly formed and devised **subject event** based on the two alert-worthy events.

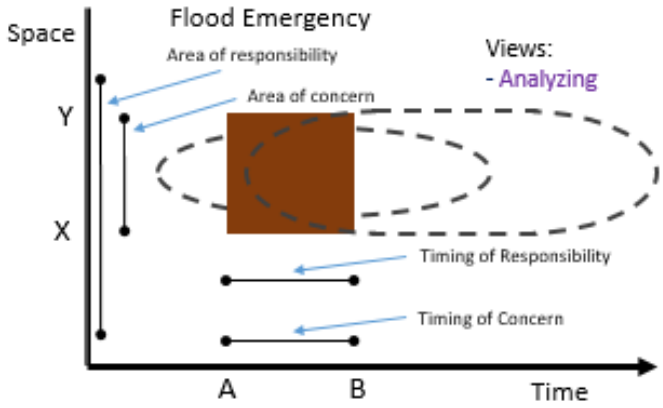
b. Note that the **flash flood event space** is **smaller** than the **subject event space**, but their **timing details align**. Conversely, the **flood event space** aligns with the **subject event space** but **not the timing details** (as the **flood event starts later**).

   i. In this **more advanced analysis**, the **flash flood timing-of-concern** serves as a timing **proxy** for the **complex-event subject event**, while the **flood event area-of-concern** is used as a location **proxy** for the **complex-event subject-event**.

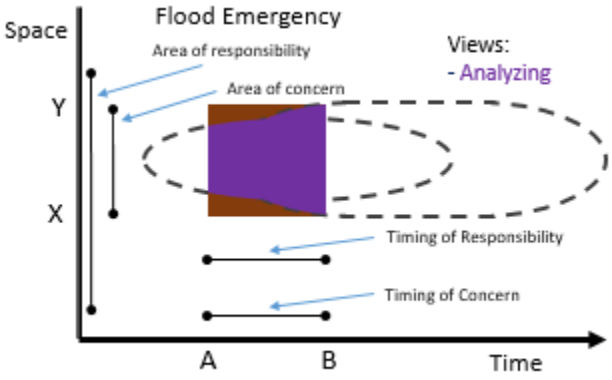
   ii. To maintain a simpler **communication** with the **consuming audience**, the **subject event location and timing** are applied to **both events of interest** in the alert signalling process. Each event is being over-alerted in space individually, however, every represented space of the **subject-event** has at least one alert-worthy event in play. Any **necessary clarifications** regarding the **event situation**, as it pertains to this **over-alerting**, could be addressed in the <**discussion**> element text if necessary.

[92] For further details on **intersection areas**, refer to the **OASIS Open Event Terms List – Concept Guide**.

8) The **larger alerting situation** space/time diagram is as follows:




a. In this baseline case, the complex-event **subject event location and timing** is less aligned with the **larger alerting situation** than it was with the simple flash flood only approach.




i. In the **brown area** of the diagram, outside of where the purple **subject event** is bounded, there is no flash flood event expected. And while there is a flood event expected, it is during the alert-worthy flood event's **lead-time period**. Such considerations may impact the audience based messaging text used in the <description> element. In more advanced situations, alerting agencies are often faced with balancing the repercussions of such details in the text.

b. If the **flash flood event of interest** was also imagined, and anticipated to begin at a **later time**, the purple **subject event timing** would also shift to **start** at that later time. However, the brown **larger alerting situation timing** would still be anchored to the **current time**, taking advantage of some additional **lead time** for flash flood preparedness and response [93].

[93] For more on lead time, see the **OASIS Open Event Terms List – Concept Guide**.

9) Any other **events of interest,** that might have impacted the larger **alerting situation,** have either **ended** or **do not exist** within this **baseline case example situation.**

   a. If additional **secondary events,** such as a **bridge collapse** or an **impending bridge failure** were apparent, they would require **assessment** and **handling** as either:

      i. A **separate alerting situation**, with its **own dedicated alert**, or

      ii. An **informational component** incorporated into this **larger complex-event alerting situation**, or

      iii. Another event-of-interest making it more than the **two** exampled.

**Fully Advanced Analysis:**

1) In this fully advanced approach, the alerting agency plans to combine up to four events-of-interest into one **complex-event alerting situation**, including the creation of two new ones, an evacuation event-of-interest and an emergency event-of-interest.

    a. In addition to what is discussed in the **fully advanced observation process,** and what is covered in the **bullet 1** in the **more advanced analysis above**, additional aspects of the **overall larger event situation** are identified.

        i. The **recent rainfall event** introduced **abnormally high volumes** of **water** into the **reservoir** before the **levee failure** occurred. This **excess water** has the potential to **intensify** the **impacts** and **prolong** the **hazards** of the **flood-based events**, further escalating the situation.

        ii. An **evacuation order** has been decided upon. This **new** event-of-interest is one that has been introduced in the analysis stage as a consequence of the analysis.

            1. At this stage, the **evacuation event is imagined**. An event-of-interest to be **triggered by the alerting process** within the **event situation**.

                a. It is considered a static event in the sense of it being an evacuation until it is not an evacuation.

            2. The evacuation **event-of-interest** would now be added to the fully advanced observation process going forward.

2) **Bullets 2 through 5** in the **simple analysis** and **bullets 2 and 3** in the **more advanced analysis** apply. Additional analysis finds:

    a. The **evacuation event-of-interest** leads to a devised and formed **evacuation alert-worthy event.** It needs to be alerted to ensure public safety.

    b. In this baseline case, as part of the alert-worthy event analysis, things like **evacuation routes**, planned to **away** from the **advancing water** rather than **toward it**, could be made.

        i. Providing **clear reference points** to assist evacuees - such as **higher ground**, designated **safety markers**, and **passable routes** like **Highway 1 West**, are considerations to make for the messaging.

ii. If some details are time consuming to compile, possibly delaying the timing of the **initial** evacuation message, they could be deferred and added to **update** messages as soon as they are available.

3) The evacuation **event-of-interest** and **alert-worthy event** remain as devised and formed until their conditions change to indicate otherwise.

   a. Their specific details could change quickly in this rapidly developing event situation, however, they are still based on the singular activity of **evacuating**, and are types of events most likely to be coordinated with partner agencies.

   b. The conditions, impacts, locations and timings of the various evacuation-based event constructs likely involve the operating procedures of the other official parties involved. This typically leads to a more adaptive approach than a pre-set one.

4) For a **complex-event situation,** involving two simultaneous flood-based events-of-interest and one evacuation event-of-interest, an appropriate complex-event group term the alerting agency might prefer, is **"emergency".**

   a. "**Emergency**", in this context, is a new event-of-interest that is a single complex-event that is made up of the other three events-of-interest. It is devised and formed by the nature, impacts, locations and timing that make up the other three.

   b. Based on the **historical data, research, scientific analysis, and conventional wisdom** surrounding such events – as fully reflected in the available **event-type** information on file - the most effective terms for each single **event of interest** are: **"evacuation", "flash flood,"** and **"flood".** For the **complex-event situation**, the most suitable single complex-event term would be "**emergency**".

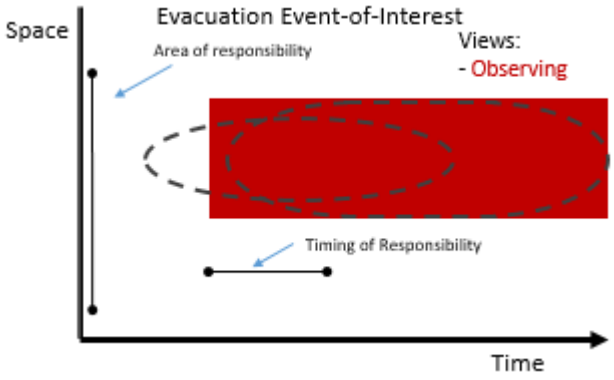
   c. While the **flash flood** and **flood events** are significant, the **evacuation** and **emergency events** are considered **more important** in this fully advanced analysis. An alert labeled with **"flash flood"** or **"flood"** may not prompt as **rapid** a **response** from the audience as **"evacuation"** or "**emergency**"**.** The term **"emergency evacuation"** provides even more context as would "**evacuation emergency**". A term like "**flood emergency evacuation**" or "**flood evacuation emergency**" would provide even more context, however, these naming forms are awkward and may add confusion as per the social science of the situation.

d. Ultimately, the **alerting agency** makes the final decision on terminology.

i. For this **baseline case**, **"emergency evacuation",** combined with the business usage alert type "**order**" leads to **"emergency evacuation order"** as the named alert. Here the evacuation is the primary event-of-interest and alert-worthy event.

ii. The flash flood and flood are still alert-worthy events; however, they are left to the message content to be found in the discussion section.

5) The **observation** of the **evacuation event-of-interest** is an **engineered** one, based on the **documented procedures** of the **alerting agency** leading up to the **decision to evacuate**. The space/time diagram for the evacuation **event-of-interest** is as follows.

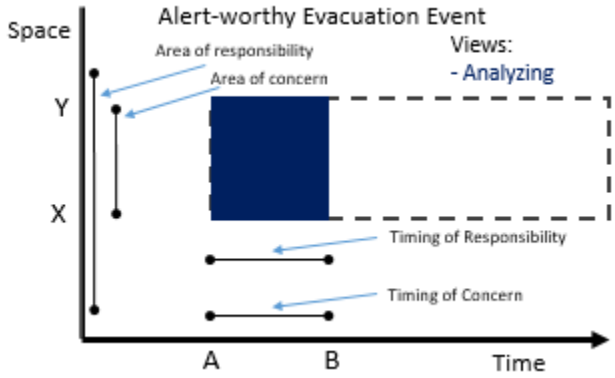



a. The **red-marked area** represents the **new evacuation event-of-interest.**

i. It is to begin immediately and covers the same area and timing as the two flood-based events-of-interest combined (as discussed in the **more advanced analysis** section).

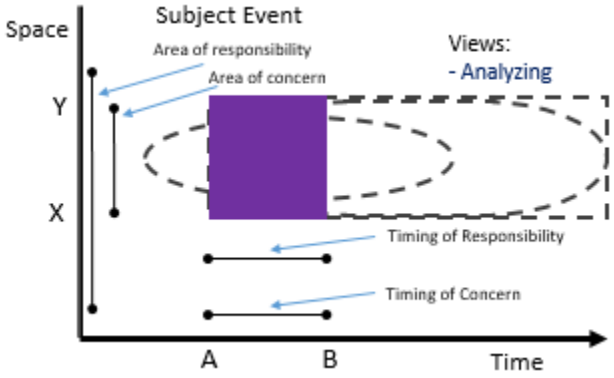
ii. The **exact end timing** of the **flood** event-of-interest remains **uncertain**, however, it is confirmed to **extend beyond** the **agency's timing of responsibility** and so the **evacuation** will too. Their endings will be dealt with in later messages.

6) The space/time diagram for the conceived **alert-worthy evacuation event,** devised and formed out of the **evacuation event-of-interest,** is as follows:




a. The blue-marked **alert-worthy event** now includes the subset nature, impacts, location and timing of the **evacuation event-of-interest** – the near term parts that are relevant to the alerting client at point-in-time A.

7) In this baseline case, the **subject-event** space/time diagram is as follows, regardless of whether the **evacuation** or the **emergency** is the primary alert-worthy event:




a. Apply the **more advanced analysis** section bullets 2 and 3, except now the **details** of the **evacuation** and the **emergency events-of-interest** would be added to the group with one or the other as the **primary event of interest.**

b. At **point-in-time A**, the **flash flood** is **real** and within the **intersection timing**, while the **flood** remains **imagined** within the **lead timing**. The **evacuation** and **emergency events-of-interest,** while **imagined** during the initial analysis process, are **real** at the time of publish, so are considered as real during the analysis.

i. The **alert message** has an **opportunity** to communicate **lead time flood information**, offering insights into the **condition** and **impacts** of the **flood event** before **flood levels** are **actually reached**, however, the **evacuation** or **emergency**, as the primary event-of-interest, have priority.

8) At the current **point in time A**:

   a. The flash flood has already begun and has some history.

   b. Flood levels will be reached shortly after point-in-time A.

   c. The evacuation event will commence immediately following the publication of the alert message.

   d. All the individual events-of-interest are fully contained within the agency's area of responsibility and are occurring, or are expected to begin, within the agency's timing of responsibility.

   e. The area and timing of the **subject event** at point-in-time A covers the area between Points A and B as well as X and Y on the diagram.

   f. Further details beyond Point B in the **larger alerting situation** will be addressed in updated messages published later. Ideally this will be done before Point B is reached:

      i. to ensure no gaps in the alerting process, and

      ii. with enough time to provide advance notice of those details as per the agency's operating alerting mandate [94].

9) Notably, at **Point-in-time B**, the **area-of-concern** of the **flash flood event of interest** (within the **area of responsibility**) is projected to have **ceased expanding**.

   i. Since the **flash flood event** is **no longer introducing new affected areas**, it will **not impact lead time decisions** for future alert messages.

   ii. **Update messages** will **not need to account for new lead time** related to **new flash flood area** [95].

[94] Refer to the **OASIS Open Alerting Practices family of resources** for comprehensive guidance on the **update frequency of alert messages** (forthcoming).
[95] Refer to the **OASIS Open Alerting Practices family of resources** for further **discussion** on this **concept**.

10) Following the **timing-of-responsibility period**, the **flash flood event** is expected to conclude once **water levels stop rising rapidly**, whereas the **flood event** will end only after **water levels recede below flood thresholds**.

    a. The **evacuation** is planned to be **lifted** upon the **end of the flood event**.

    b. At **point-in-time A**, the **later timing-of-responsibility information** beyond **point-in-time B** is **not critical.** The timing details remains uncertain and are to be addressed in **subsequent alert message updates** throughout the **alerting process**.

11) In this baseline case, the **analysis** of the **evacuation event of interest** confirms that the **alerting agency** prefers the term **"emergency evacuation".** Their **evaluation indicates** that **"emergency evacuation"** creates a **stronger impression** on **audiences**, leading to a **slightly improved response uptake** compared to **"evacuation emergency"** or the standalone term **"evacuation"**.

    a. One **critical impact** of an **"emergency evacuation"**, as opposed to simply **"evacuation",** is the necessity to **evacuate as quickly as possible**, potentially **leaving all non-essential belongings behind**. If this is the **intended directive**, the **alert message** should clearly **address this concern**, ensuring that evacuees understand the urgency and expectations.

        i. In this case, **"emergency"** functions as a **noun adjunct**, modifying **"evacuation"** to specify a particular type of evacuation response.

        ii. Audiences often **seek validation** of alert messages before taking **significant actions**. The more **context** an **initial message provides**, the easier it is for recipients to **confirm its legitimacy** and **respond appropriately**. Additionally, **"emergency evacuation"** is a **concise yet impactful term** that **effectively conveys urgency** without being **overly wordy** - ensuring that audiences can **quickly grasp** the critical message while dealing with their own situation.

        iii. Another term, like **"emergency"** alone, may lead to **assumptions** about the condition of the **emergency**, potentially causing some **alerts to be ignored** until recipients **confirm** that the situation **directly affects them**.

    b. Effectively **describing a situation** to **prompt an immediate audience response** is **challenging** from a **social science perspective**. To facilitate **fast and informed decision-making**, it is essential to **capture historical insights, research findings, scientific analysis, and conventional wisdom** into the analysis.

c. The **pre-determined** business usage **alert type** for the alert assigned to this **particular larger alerting situation** is **"order"** [96]**.** This designation follows a **long-standing practice** which consistently utilizes the **"order"** label to effectively **communicate an "emergency evacuation"** in an **alerting situation**.

    i. The **full named alert** in this example is **"emergency evacuation order."** It consists of the chosen event type label **"emergency evacuation"**, and the chosen business usage alert type label **"order."**

d. The **alert message** intended for the **audience** will incorporate **key text elements** derived from the **actual analysis** of the **evacuation alert-worthy event,** and all the secondary **alert-worthy events**. These details are to ensure that the **message remains accurate, relevant, and informative**.

e. The remaining **text in the alert message** will be extracted from the **primary event-type "evacuation"** and the secondary **event-types** where applicable. To ensure clarity and effectiveness, the **alerting agency** will draw upon **historical data, research, scientific analysis, conventional wisdom, and established policies** for handling **evacuation events** and the secondary alert-worthy events as part of the larger alerting situation.

f. The **alerting agency** has identified a **matching entry** in the **OASIS Open Event Terms List** for **"evacuation."** As a result, any available **information** related to the **OASIS Open Event Term "evacuation"** can now be **integrated** into the **originating CAP process**.

    i. Analysis of the **alerting agency's event type "evacuation"** determines that the appropriate **CAP category** for this **event of interest** is **"Safety."** This **CAP category assignment** was established through **business research** conducted **well before** the actual event is to be alerted.

    ii. All other events-of-interest in the larger alerting situation would also undergo this same analysis to compliment the evacuation event-of-interest.

12) For the **levee collapse** event, see bullet 17 in the simple analysis above. The **rainfall** event is treated in the same manner.

[96] See section on **Naming Alert Objects** in the **OASIS Open Event Terms List – Concept Guide** for more information.

13) Note that for any **one event of interest**, all other **events -** including additional newly created **events of interest -** are classified as **associated secondary events** related to the primary event.

    a. In this situation, **rainfall, levee collapse, and emergency water barrier operations** do **not qualify** as **events of interest** for alerting purposes. However, they are still **relevant** and may provide **valuable contextual information**.

        i. These **events** contribute to the **overall story** within the **alerting process**. If any of them contain **event-type information**, that data should be **readily available** for **use as needed**.

14) If the **situation analysis** indicated that only a **partial evacuation** is necessary for the larger **impacted area**, then for the **non-evacuation subset area-of-concern**, a **different primary event of interest** may be more appropriate. **Evacuation** is not the **top priority** in that other subset area.

    a. The **alerting agency** must decide whether to classify this event situation as **one situation** or **two**. If **two**, the **flash flood** or **flood** could take the positon of **primary event of interest** in the **other situation** that does not involve an **evacuation**.

    b. A possible **directive** in **both subset areas** would be to **encourage ongoing monitoring** for **updated messages**. In changing situations, especially complex-event alerting situations, the **primary event of interest,** areas, and timing, can easily shift and evolve.

### 4.2.4 CAP Originating Process

**CAP subject-event:** primary flash flood(simple), primary flash flood with secondary flood (more advanced), primary evacuation with secondary flash flood, flood, and emergency (fully advanced)
**OASIS Open Event Term:** flash flood, flood, evacuation, emergency
**OASIS Open Event Term Code with CAP categories:** flash flood (OET-080; Environmental, Safety), flood (OET-82; Environmental, Safety), evacuation (OET-XXX [97]; Other), emergency (OET-XXX; Safety)

**Simple Message** (Event-based CAP elements):

**<code>layer:OASIS-Open:ETL-LT:v2.0</code>**
**…**
**<info>**
**…**
**<category>Env</category>**
**<category>Safety</category>**
**<event>flash flood</event>**
**…**
**<eventCode>**
**<valueName>layer:OASIS-Open:ETL-LT:v2.0</valueName>**
**<value>OET-080</value>**
**</eventCode>**
**<eventCode>**
**<valueName>*[other event code scheme reference (non-OASIS Open)]*</valueName>**
**<value>*[other event code value]*</value>**
**</eventCode>**
**…**
**<expires>*[end timing of subject event]*</expires>**
**…**
**<headline>flash flood warning in effect</headline>**
**…**
**</info>**

[97] Actual values for XXX will be substituted when the **Event Terms List – Lookup Table** has been publically reviewed and code numbers are assigned. That process is concurrent with this **User's Guide** Public Review process.

1) The **primary** event-type for this **baseline case example situation** in the simple analysis is the locally defined “flash flood”. Based on this **event type**, specific **CAP elements** can be **populated** using **stored values** associated with this event-type.

2) The **OASIS Open EMTC** recommends the <**code**> element is **included** in all CAP messaging (from simple to advanced), where **OASIS Open Event Terms List** information is to be present in the <**eventCode**> element. The **OASIS Open EMTC** recommends the <**code**> element be included exactly as shown with the value “**layer:OASIS-Open:ETL-LT:v2.0”**. The inclusion of the <**code**> element is a **simple** addition to the **CAP** message as it is a **courtesy** element for consumer use not affecting the alerting process. Refer to the **CAP Consuming Process** below for additional details regarding its value in **CAP** messaging.

    a. This <**code**> element value signifies the presence of an **additional layer** of **OASIS Open-defined event-type information** within the **CAP message**. This **extra layer** enhances the **standard information** contained in a **CAP alert message** but is **not intended to replace or override** any **existing standard CAP elements** [98].

    b. The <**code**> element **notifies CAP consumers** that the **OASIS Open Event Terms List** is incorporated into this **CAP message**. The **presence** of the <**code**> element provides CAP consumers with the **option** to enforce **stricter process handling rules** when **interpreting** and **processing CAP alert messages** [99].

3) An **examination** of the **OASIS Open Event Terms List** indicates that the most suitable **event-type match** for this **subject event** is **“flash flood.”** The **OASIS Open event-type code** for this situation is **OET-080** and the **OASIS Open CAP Categories** assigned to **“flash flood”** is **“Environmental”**. Additionally, the listed **OASIS Open subcategory** for this event type is **“terrestrial.”** This **CAP categories and subcategory** was determined by the **OASIS Open EMTC** when incorporating **“flash flood”** into the **OASIS Open Event Terms List** [100].

    a. As this example is likely a Public Alert, the alerting agency has opted to include “Safety” as an additional CAP category, citing “life” and “property” as applicable **OASIS Open** subcategories in their assessment. “Safety/life” and “Safety/property” is added to the event-type information on file.

[98] Refer to the **OASIS Open Alerting Practices** family of **resources** for further **information on layers**. (**forthcoming**).
[99] Refer to the **OASIS Open Alerting Practices** family of **resources** for further **information on the <code>** element (**forthcoming**).
[100] Refer to the **OASIS Open Event Terms List - Lookup Table** resource for more **information**.

b. The two <**category**> elements, in this example, are populated with "**Env**" and "**Safety**" [101].

4) The <**event**> element, in this simple **baseline case example situation**, is populated with the **locally defined "flash flood" label.** The <**event**> element **sources** its value from the **subject event**, which for this simple message, is composed of only the "**flash flood**" **primary** event-of-interest.

   a. In this instance, the "**flash flood**" **local event term** and the **OASIS Open term** are **identical** [102].

5) Other terms that are **not** recommended for the <**event**> element include.

   a. "**flash flood warning**", as this is an incorrect reference to the named alert, not the event-type

   b. "**flash flood event**", as this is not the look and feel of the **OASIS Open EMTC** recommended event-type naming format. The recommended format does not include the word "**event**".

   c. "**flash flood warning issued**", as this an incorrect reference to the **alert**, not the **event**. Such text is more appropriate to a headline, not the event-type in the <**event**> element.

   d. "**Main Street flood**", as this a reference to an actual **named event**, not the **event-type**.

6) <**eventCode**> group elements may **optionally** be included in the **CAP message** and should associate with the **subject event** and the **larger alerting situation**. In simple cases it is one. With this User's Guide, the aim is to have at least one instance of this group element be present and populated with an **OASIS Open** event code.

[101] The CAP category is mainly used by agents along the path of distribution for filtering, routing and presentation actions. Unless these actions are based on other elements (i.e. like an event code), such actions are common with the use of the <**category**> element in a CAP message.

[102] In many situations, a difference may exist between the **local** event-type term and the **OASIS Open** event-type term.

7) One of the multi-instanced <**eventCode**>.<**valueName**> elements in the CAP message, the one of interest to the **OASIS Open EMTC** regarding interoperability, is populated with "**layer:OASIS-Open:ETL-LT:v2.0."** It indicates a reference to version 2.0 of the **OASIS Open Event Terms List - Lookup Table** for cross referencing purposes. In the simple case, other non-**OASIS Open** <**eventCode**>.<**valueName**> elements in other <**eventCode**> group elements would be populated with a reference to another event code scheme.

8) The corresponding <**eventCode**>.<**value**> element to the <**eventCode**>.<**valueName**> of "**layer:OASIS-Open:ETL-LT:v2.0"** in the <**eventCode**> block in this simple **baseline case example situation** is populated with **OET-080** for flash flood.

    a. The **OASIS Open EMTC** recommends that at least **one OASIS Open event-type code** be present in every **CAP message** to reinforce the goal of **interoperability**.

    b. Any other <**eventCode**> group element, based on the same or a different event typing scheme, can be populated in a similar fashion (see the more advanced **baseline case example situation** section for a case where the same event typing scheme is used more than once).

9) The **CAP originator** does not generate the <**eventCode**> element for **direct audience consumption**, as it is not typically **presented to them in its raw form**. Instead, the <**eventCode**> serves primarily as a **technical reference** for **agents** involved in **filtering, routing, and presenting activities**. By incorporating an **event code**, these agents can **enhance presentations** and execute **processing actions** with greater **detail and precision.**

10) The **expectation** is that prior to <expires> time of the CAP alert message, the initial message's **content would likely become outdated**, prompting the need for a **new message** to be issued. This new issue would be **before the <expires> time,** as an act to **supersede** the original **Point A** publication. The **OASIS Open EMTC** recommends setting the <**expires**> value to **the end time of the subject event**, even if the **event-of-interest** is expected to be ongoing in the **area of concern** at **that time**. If the **event of interest** is expected to conclude before the **timing-of-responsibility period** ends, the <**expires**> element can alternatively be set to **the end timing of the larger event situation**, which - under most circumstances - would typically align with the **subject event** and the **event of interest's** conclusion as analyzed [103].

[103] Refer to the **OASIS Open Alerting Practices** family of **resources** for further **information** (forthcoming).

11) The <**headline**> element typically contains a free text **headline** with the **named alert** as part of the headline: <**headline**>**flash flood warning in effect**</**headline**>.

a. **<headline>** may or may not be a fully formed sentence and should be devoid of capitalization and punctuation – aside from proper nouns and intrinsic punctuation such as an apostrophe as part of a name. Full sentence elements (such as <**description**> and <**instruction**>) should follow standard capitalization rules, while non-sentence elements (such as <**headline**> and <**event**>) should be treated as text snippets. These snippets may later be merged into larger structured text within presentations. **Capitalization** of text snippets is the **responsibility** of the **presentation agent** after the merging. The consuming agency should apply capitalization based on sentence structure rules once a complete sentence has been formed.

b. For further guidance on presentation practices, refer to the **OASIS Open Alerting Practices** family of documents.

**More Advanced Message** (Event-based CAP elements with differences from the simple messaging highlighted in grey discussed):

```
<code>layer:OASIS-Open:ETL-LT:v2.0</code>
…
<info>
…
<category>Env</category>
<category>Safety</category>
…
<eventCode>
  <valueName>layer:OASIS-Open:ETL-LT:v2.0</valueName>
  <value>OET-080</value>
</eventCode>
<eventCode>
  <valueName>layer:OASIS-Open:ETL-LT:v2.0</valueName>
  <value>OET-082</value>
</eventCode>
<eventCode>
  <valueName>[other non-OASIS Open event code scheme reference]</valueName>
  <value>[other non-OASIS Open event code value]</value>
</eventCode>
…
<expires>[end timing of subject event]</expires>
…
<headline>flash flood warning in effect</headline>
…
</info>
```

1) As per bullet 1 in the **simple** message, the **primary** event-type for this analysis of **baseline case example situation** is still the locally defined “flash flood”. Based on this **event type**, specific **CAP elements** can be **populated** using **stored values** associated with this event-type

2) The **secondary event-type** for this **example situation** is the **locally defined “flood.”** Based on this **event type**, specific **CAP elements** can be **populated** using **stored values** associated with this event-type. The **OASIS Open event-type code** for **“flood”** is **OET-082**. Such **secondary codes** may **optionally** be included in the **CAP message** and like the **primary codes** are linked to either the **subject event** and **larger alerting situation**.

    a. The <eventCode> element is a **multi-instanced element**, meaning it can contain **instances from multiple event code schemes**. However, in some cases - such as this example - it may also include **multiple instances** from a **single event code scheme**. See the later **CAP Consuming Process** discussion for this **baseline case example situation** for a discussion on this point and why it is an **advantage** to **advanced systems**.

    b. The **primary event-of-interest** <**eventCode**> for each **event code scheme** should be **placed first** in the **CAP file**. While this is **not a requirement** of **XML** or **data management**, it is a **practical consideration**; some **consuming systems** only process the **first code** they encounter and do **not search further**. By ensuring the **primary event-of-interest code** appears **first**, it increases the likelihood that it is **successfully identified** by these consuming processes [104].

[104] This **ordering recommendation** extends beyond the <**eventCode**> element. For **any multi-instanced element or group**, the **most important instance** should always be **placed first** to help consuming systems that may not be able to handle more than one instance. For further guidance, refer to the **OASIS Open Alerting Practices family of resources** (forthcoming).

**Fully Advanced Message** (Event-based CAP elements with differences from the simple and more advanced messaging highlighted in grey):

```
<code>layer:OASIS-Open:ETL-LT:v2.0</code>
…
<incidents>[incident ID (i.e. EMS-001)]</incidents>
…
<info>
…
<category>Other</category>
<category>Env</category>
<category>Safety</category>
<event>emergency evacuation</event>
…
<eventCode>
  <valueName>layer:OASIS-Open:ETL-LT:v2.0</valueName>
  <value>OET-XXX</value> /* evacuation */
</eventCode>
<eventCode>
  <valueName>layer:OASIS-Open:ETL-LT:v2.0</valueName>
  <value>OET-XXX</value> /* emergency */
</eventCode>
<eventCode>
  <valueName>layer:OASIS-Open:ETL-LT:v2.0</valueName>
  <value>OET-080</value>
</eventCode>
<eventCode>
  <valueName>layer:OASIS-Open:ETL-LT:v2.0</valueName>
  <value>OET-082</value>
</eventCode>
<eventCode>
  <valueName>[other non-OASIS Open event code scheme reference]</valueName>
  <value>[other non-OASIS Open event code value]</value>
</eventCode>
…
<onset>[current publish time]</onset>
<expires>[end timing of concern]</expires>
…
<headline>emergency evacuation order in effect</headline>
…
</info>
```

1) Unlike bullet 1 in the **simple** and **more advanced** messages, the **primary** event-type for this analysis of the **baseline case example situation** is the locally defined "emergency evacuation". Based on this **event type**, specific **CAP elements** can be **populated** using **stored values** associated with this event-type.

2) In the **fully advanced** message, the **secondary event-types** for this **example situation** are the **locally defined "flash flood", "flood",** and **"emergency".** Based on these **event types**, specific **CAP elements** can be **populated** using **stored values** associated with these event-types. These **secondary codes** may **optionally** be included in the **CAP message** and like the **primary codes** are linked to the **subject event** and **larger alerting situation**.

3) In the **fully advanced** message, an **examination** of the **OASIS Open Event Terms List** indicates that the most suitable **event-type match** for this **subject event** is **"evacuation."** The **OASIS Open event-type code** for this situation is **OET-XXX** and the **OASIS Open CAP Category** assigned to **"evacuation"** is **"Other".** Additionally, the listed **OASIS Open subcategories** for this event type include **"other".** These **categories and subcategories** were determined by **OASIS Open** when incorporating **"evacuation"** into the **OASIS Open Event Terms List** [105].

    a. Additionally, the secondary alert-worthy events that helped devise and form the subject event, the **"flash flood", "flood",** and **"emergency"**, are also checked for an **OASIS Open event-type code.** The **OASIS Open event-type code** for **emergency** is **OET-XXX** and the **OASIS Open CAP Category** assigned to **"emergency"** is **"Other".** Additionally, the listed **OASIS Open subcategories** for this event type include **"other".**

4) Like bullet 4 in the simple message, the three <**category**> elements, in this example, are populated with "**Other**", "**Env**" and "**Safety**". The alerting agency policy had selected "**Other"** previously as the **CAP category** value to store with their locally defined **emergency evacuation.**

5) The <**event**> element, in this fully advanced **baseline case example situation**, is populated with the **locally defined "emergency evacuation."** The <**event**> element **sources** its value from the **subject event**.

    a. In this instance, the **local event term** "**emergency evacuation**" and the **OASIS Open term** "**evacuation**" are **not identical**. The local term "emergency evacuation" should appear in the **CAP** message <event> while the **OASIS Open** term can be obtained, if

[105] Refer to the **OASIS Open Event Terms List - Lookup Table** resource for more **information**.

desired, by consumers using the **OASIS Open** based <eventCode> element values and indexing the values into the **OASIS Open Event Terms List – Lookup Table.**

b. If no local term is available, or if the alerting agency uses the **OASIS Open Event Terms List** as provided, the terms would then match.

6) Other terms that are **not** recommended for the <**event**> element include.

a. "**evacuation warning**", as this is an incorrect reference to a named alert, not the event-type

b. "**evacuation event**", as this is not the look and feel of the **OASIS Open** recommended event-type naming format. The recommended format does not include the word "**event**".

c. "**evacuation alert issued**", as this an incorrect reference to the **alert**, not the **event**. Such text is more appropriate to a headline, not the event-type in the <**event**> element.

7) **Refer** to bullets 7 and 8 in the **simple** message section as they apply.

8) The corresponding <**eventCode**>.<**value**> element to the <**eventCode**>.<**valueName**> of "**layer:OASIS-Open:ETL-LT:v2.0"** in the <**eventCode**> group element in this simple **baseline case example situation** is populated with **OET-XXX** for evacuation.

a. The other <**eventCode**> group elements, based on the same **OASIS Open** event typing scheme, can be populated in a similar fashion with **OET-XXX, OET-080** and **OET-082** as shown in the fully advanced example **CAP** message above.

b. See sub bullets 2a and 2b in the previous more advanced section above as they apply.

9) **Refer** to bullets 10 and 11 in the **simple** message section as they apply here.

10) The <**incidents**> element should be populated with an **incident ID** or **incident name**, if available, in accordance with the **CAP standard**. If an **incident identifier** is provided by the **alerting agency** or a **partner agency**, it enables **consuming agencies** to **cross-reference** alert messages across different organizations, ensuring they are recognized as part of the **same incident situation**.

11) The optional <**onset**> element is populated with the start time of the **subject-event**.

a. **If present**, it will happen to match the start time of the intersection period of the **evacuation event-of-interest** to the **area-of-concern** simply because the agency is **using** the published alert message to **initiate** the **evacuation event**. As it matches the publish time of the message, the <**onset**> element could be omitted from the **CAP** message on the understanding that the immediate response to the message would already be for the audience to begin evacuating.

b. For **moving events -** though not **applicable** to this **evacuation scenario -** the <**onset**> element may not be **meaningful** for all locations within the **area of concern**. As a result, it is often **omitted** in such cases. However, in the case of an **ordered evacuation -** where different **sections of town evacuate sequentially -** the <**onset**> element should reflect the **timing of the first evacuation area**. And then additionally, the <**discussion**> element would be **recommended** as the appropriate place to **detail the evacuation sequence** for the remaining areas, including the **specific timing** for the other areas.

12) The <**headline**> element typically contains a **free-text headline** that includes the **named alert** within it (i.e. <**headline**>**emergency evacuation order in effect**</**headline**>).

### 4.2.5 CAP Consuming Process

**CAP subject-event:** primary flash flood (simple process), primary flash flood with secondary flood (more advanced process), primary evacuation with secondary emergency, flash flood and secondary flood (fully advanced process)
**OASIS Open Event Term:** flash flood, flood, evacuation, emergency
**OASIS Open Event Term Code with CAP categories:** flash flood (OET-080; Environmental, Safety), flood (OET-82; Environmental, Safety), evacuation (OET-XXX; Other), emergency (OET-XXX)

**Simple Message** (Event-based CAP elements):

Refer to the **Simple Message** as exampled in the **CAP Originating Process**.

1) The <**code**> element is a **courtesy** element for the consuming agent, declaring for the agent that the **CAP** message to follow includes **special handling** elements that **conform** to the **rules** of a specific **layer** or **profile**. The <**code**> element can be ignored by consuming agencies, however, consuming agencies that make use of them are able to realize the benefits they provide. Refer to the fully advanced message section below for details.

    a. Supplying the <**code**> element is a simple messaging activity for originators while processing the <**code**> element is an advanced messaging activity for consumers.

2) The <**category**> element is a multi-instanced element in CAP, and in this simple baseline case example, it has a multi-instance usage. The two **CAP** <**category**> elements in this example are populated with "**Env**" and "**Safety**".

    a. If <category> element filtering is deployed, the **CAP** consuming agent is recommended to process the message further simply by having at least one of the <**category**> values match one of their categories of interest.

    b. They could **filter** this message for specific **CAP category** based **processing**, based on one or all of the CAP **categories** of interest that has a match.

    c. They could **route** this message further down the **path of distribution**, based on one or all of the CAP **categories** of interest that has a match.

    d. They could **present** the message (**reformatted** for presentation) to an audience based on any consuming agency **special presentation** rules they may have for one or more of these <**category**> values.

3) The <**event**> element is populated with the value **"flash flood" -** a **free-text element** obtained from the **event-type** on file with he originating agency. This value is **intended for the audience**, and the consuming **agent's role** is simply to **pass it through** and **present it** without modification.

    a. The **OASIS Open EMTC recommends** that agents **do not filter or route** the CAP message based on the <**event**> element. This element is a **free-form, audience-based display element** and is **not guaranteed** to adhere to a **standardized set of values**.

    b. The **OASIS Open EMTC recommends** presenting the <**event**> element **as is**, without modification, while optionally including a **lead-in text snippet** such as: **"Event type:"** leading to **"Event type: flash flood."** From the **CAP standard perspective**, this information aims to **identify the event-type**, rather than describe the **specific occurrence of the event** [106].

        i. If the <event> element were to contain something like **"gale force wind"**, the suggested **OASIS Open** event-type would be given as **"wind." OASIS Open** does not incorporate **externally managed scale-based typing schemes,** however, the originator is free to describe the <**event**> for the audience with terms that best fit their service [107].

4) The optional <eventCode> element is populated in this example case with the **OASIS Open event-type code** for **flash flood**. A **CAP consuming agent** - by detecting a **matching flash flood** <**eventCode**> within its list of **event codes of interest** - would continue to process the message.

    a. They could **filter** and/or **route** the message for processing and delivering the message further down the **path of distribution**.

    b. They could present the message (reformatted for presentation) to an audience based on any consuming agency special rules this <**eventCode**>.

[106] The **presentation** should not **misrepresent** the **event type** as the **actual event**, even though they often **share the same text**. Audiences should **not be conditioned** to expect the **event type** to directly indicate the **specific incident**. If **CAP originators** mix these two usages, it may lead to **confusion over time** and **weaken interoperability** within the alerting process.

[107] Refer to the **OASIS Open Event Terms List - Spectrum Analysis** resource for further insights.

c. Relying on **keyword searches** within a **human-oriented alert message** can result in **processing failures.** Using **event codes** ensures **efficient filtering** and **reliable identification** of relevant events-of-interest.

5) The <**expires**> time marks the **point-in-time B** when the **alert notification signal** should be **discontinued**, as per instruction from the **CAP originating agency**. If <**expires**> is provided, it is set at **point-in-time A** (the time of **publication**) to some future **point-in-time B**, with the expectation that the **CAP message** will expire at **point-in-time B**, or be **superseded** by a newer, updated message, prior to **point-in-time B**.

   a. This superseding aspect is a hard rule in CAP. It effectively **resets** the existing and active alert notification signal to a **new** <**expires**> **time**. The signal continues and the carried information changes. It has been adjusted to remain **current and actionable** [108].

   b. If the <**expires**> time is reached before a new message arrives, the existing message presentation should be **discontinued**. Some originators let messages self-expire without a new message to formally **end** the **alert notification signal**.

6) The <**headline**> element is a **free-form** snippet of **text element** intended for the target **audience.** The consuming agent's role is to incorporate it into a presentation with some modification [109]. The <**headline**> element should arrive **devoid** of **capitalization** and **punctuation** – aside from proper nouns and intrinsic punctuation (i.e. an apostrophe or hyphen as part of a name).

   a. <headline> text snippets may be merged into larger structured presentations. **Capitalization** of text snippets is the **responsibility** of the **presentation agent** based on sentence structure rules once a complete structured presentation has been formed.

[108] Refer to the **OASIS Open Alerting Practices** family of resources for further insights (forthcoming).
[109] For more on presentation practices, see the **OASIS Open Alerting Practices** family of documents (forthcoming).

**More Advanced Message** (Event-based CAP elements):

Refer to the **More Advanced Message** as exampled in the **CAP Originating Process.**

1) The CAP consumer processes the **More Advanced Message** in the same manner as processing the **Simple Message**. In this process, however, the CAP consumer will find two <eventCode> values from the **OASIS Open Event Terms List**.

2) The two **OASIS Open** <**eventCode**> elements are populated - one with the **event-type code** for **flash flood**, and another with the **event-type code** for **flood**. A **CAP consuming agent -** upon detecting **one or more matching** <**eventCode**> **values** within its **event codes of interest -** would continue to **process the CAP message** in accordance with their **standard processing procedures.**

    a. The goal is to **simplify the originating and consuming processes**. The originating agency includes the two that apply to the subject event, and the consuming agency looks for event-types of interest to them. The **OASIS Open EMTC** recommends the consuming agency take each <eventCode> in-turn and checks their own list for a match, and if at least one code of interest is found, they continue processing the message.

        i. If the CAP originating agent includes only one instance of the <eventCode> element, the in-turn process is not compromised. Many CAP originators think to put only one instance into a CAP message.

        ii. A **CAP consuming agent's ability** to rely on a **CAP originating agent** to put at least one instance into the CAP message is **based on mutual agreement**. Such agreements are typically established between **partner organizations** and are **reinforced within CAP** through the **use of layers and profiles** [110]. With the presence of the **OASIS Open Event Terms List**, agreements can be made upon a pre-existing and maintained list to reduce the work effort to establish such a list.

[110] Refer to the **OASIS Open Alerting Practices family of resources** for detailed guidance on **layers and profiles**.

**Fully Advanced Message** (Event-based CAP elements):

Refer to the **Fully Advanced Message** as exampled in the CAP Originating Process.

1) The CAP consumer processes the **Fully Advanced Message** in the same manner as processing the **More Advanced Message**. In this process, however, the CAP consumer will find four <eventCode> values from the **OASIS Open Event Terms List**.

2) Four **OASIS Open** <**eventCode**> elements are populated - one with the **event-type code for evacuation**, one with the **event-type code for emergency,** another with the **event-type code for flash flood**, and a fourth with the **event-type code for flood**. A **CAP consuming agent -** upon detecting **one or more matching** <**eventCode**> **values** within its **event codes of interest -** would continue to **process the CAP message** in accordance with their **standard processing procedures.**

    a. The goal is to **simplify the originating and consuming processes**. The originating agency includes the four that apply to the subject event, and the consuming agency looks for event-types of interest to them. The **OASIS Open EMTC** recommends the consuming agency take each <eventCode> in-turn and checks their own list for a match, and if at least one code of interest is found, they continue processing the message.

3) The <**incidents**> element is **optional** and serves as a mechanism for **consuming agencies** to **cross-reference alert messages** that pertain to the **same incident event**. While primarily used to **link messages from different agencies**, it can also apply to **multiple alerts** issued by the **same agency** for a **single incident**. For example, if the **flash flood, flood,** and **evacuation event situation**, was to be conducted as three separate alerts, they could be **tied together** by assigning them the **same** <**incidents**> **value**, ensuring a means to cross-reference the related alerts [111].

4) The <**onset**> element, when present, specifies the **start time** of the **subject event**. It does not have a compliment timing element for the **end time** of the **subject event**. <onset> should be presented as a **distinct value**, similar to **event type** and **headline** (i.e. **"Event start timing: [onset time]".** The **phrasing and formatting** of the <**onset**> time should be **adjusted** by the **CAP consuming agent** to ensure it is **more audience-friendly** than the existing standard format for this CAP element [112].

[111] See the **OASIS Open Alerting Practices** family of resources for more on <**incidents**>.

[112] The <**effective**> and <**expires**> elements are for alert signal start and end timing, not **event** start and end timing.

5) The <**headline**> element is processed the same as in the simple CAP message, except it will likely have a different value based on a different primary event-of-interest.

# 5 Event Situations

*This section will be generated with example situations to demonstrate many of the concepts discussed in the **OASIS Open Event Terms List - User's Guide** and the **OASIS Open Event Terms List - Concept Guide**. As an unfinished section, and as part of this Public Review stage, work will be taken to expand the section during the Public Review process**.** New example content will either be inserted here, as part of this **Users' Guide**, or placed into the **Concept Guide**. The provided examples will run the spectrum of simple to fully advanced involving many different event-types.*

# Appendix A: Acknowledgments

## A.1 TC Participants

The following individuals were members of the EMTC during the creation of this document and their oversight and guidance are gratefully acknowledged:

| | |
|---|---|
| Elysa Jones | Individual |
| Gary Ham | Individual |
| Mark Wood | Disaster Relief Communications Foundation |
| Rex Brooks | Individual |
| Toby Considine | University of North Carolina at Chapel Hill |
| William Cox | Individual |
| Thomas Ferrentino | Individual |
| Johannes Fleisch | EUMETNET |
| Mike Gerber | NOAA/NWS |
| Steve Hakusa | Google Inc. |
| Andrea Hardy | NOAA/NWS |
| Alfred Kenyon | DHS Office of Cybersecurity and Communications |
| Mark Lucero | DHS Office of Cybersecurity and Communications |
| Norm Paulsen | individual |
| Scott Robertson | Kaiser Permanente |
| Andreas Schaffhauser | EUMETNET |
| Jeff Waters | US Department of Defense (DoD) |
| Jacob Westfall | Individual |
| Herbert White | NOAA/NWS |
| Kai Roddeck | MECOM |
| Kasia Mohammed | Google |
| Mandy Best | MECOM |
| Rainer Kaltenberger | Individual |
| Spencer Williams | FEMA |
| Thomas Wood | Disaster Relief Communications Foundation |

## A.2 CAP Subcommittee Participants

The CAP Subcommittee is Chaired by Jacob Westfall who has led the committee in the development of this Public Review Committee Note. The tireless efforts of Thomas Wood and Norm Paulsen supported by lead editor Rex Brooks have made this document possible. The following individuals have participated in the subcommittee creating this lookup table reference and are gratefully acknowledged:

| | |
|---|---|
| Andrea Hardy | NOAA/NWS |
| Andreas Schaffhauser | EUMETNET |
| Elysa Jones | Individual |
| Johannes Fleisch | EUMETNET |
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| Herbert White | NOAA/NWS |
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| Kasia Mohammed | Google |
| Mandy Best | MECOM |
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| Mike Gerber | NOAA/NWS |
| Norm Paulsen | Individual |
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| Rex Brooks | Individual |
| Spencer Williams | FEMA |
| Thomas Wood | Disaster Relief Communications Foundation |

## A.3 Special Thanks

The Committee would like to acknowledge the assistance provided to the work of the initial CN from:

| | |
|---|---|
| Frank Bell | Kybernetix |

# Appendix B: Revision History

| Revision | Date | Editor | Changes Made |
|---|---|---|---|
| 01 | 01-10-2025 | Norm Paulsen | First Complete Public Review Draft |
| 02 | | | |
| 03 | | | |
| 04 | | | |
| 05 | | | |