# Common Alerting Protocol Tsunami Profile

## CAP-TSU

**Draft**

Version 1.1
September 30, 2013


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Document Change History

| Revision | Date | Description | Revised By |
|---|---|---|---|
| 1 | 10/06/12 | Initial Version | Carrick |
| 2 | 06/20/13 | Updates based on feedback and various software updates | Carrick |
| 3 | 09/30/13 | Name Change WCATWC to NTWC | Carrick |
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# 1 CAP-TSU 1.1

## 1.1 Purpose of this Document

This document provides details and rationale for version 1.1 of the tsunami profile for the Common Alerting Protocol (CAP). This document does not attempt to duplicate the existing CAP specification. Discussion will be restricted to those CAP elements that contribute to the tsunami CAP profile (CAP-TSU[1]).

The primary goal of this document is to capture and describe CAP-TSU work to date. Version 1.1 of CAP-TSU forms the basis of an official tsunami CAP layer.

The tsunami profile complies with the Common Alerting Protocol (CAP) 1.2 specification. CAP-TSU is valid CAP.

The current version of CAP-TSU is 1.1

## 1.2 CAP References

CAP-TSU version 1.1, uses CAP version 1.2:

http://docs.oasis-open.org/emergency/cap/v1.2/CAP-v1.2-os.html

The latest version of this document is available on-line at:

http://ntwc.arh.noaa.gov/cap/documents/CAP-TSU-v1.1.pdf

## 1.3 Acronyms and Abbreviations

| | |
|---|---|
| CAP | Common Alerting Protocol |
| CAP-TSU | Tsunami CAP Profile |
| PTWC | Pacific Tsunami Warning Center |
| TEX | Tsunami Event XML |
| TWC | Tsunami Warning Center |
| UGC | Universal Geographic Code |
| UTC | Coordinated Universal Time |
| VTEC | Valid Time Event Code |
| NTWC | National Tsunami Warning Center |
| XML | Extensible Markup Language |

[1] The notion of CAP-TSU (i.e., a tsunami CAP profile) is based loosely on the Canadian CAP profile (CAP-CP). Please see http://capan.ca/index.php/en/cap-cp/ for more details.

## 1.4 Tsunami CAP Profile (CAP-TSU)

The use of a tsunami CAP profile is required in order to address needs specific to the tsunami community. The tsunami CAP profile provides a tsunami hazards context with regards to the alerting community.

To participate in the development and refinement of the tsunami CAP profile, a tsunami CAP Community of Interest (COI) has been created.

Please see: http://ntwc.arh.noaa.gov/cap for more details.

## 1.5 CAP-TSU Security

All CAP-TSU documents are digitally signed[2]. This allows third parties to have a reasonable expectation, that the CAP-TSU document has not been tampered with.

It is strongly recommended that any third party using CAP-TSU documents verify the document before using.

The public key is available at: http://ntwc.arh.noaa.gov/cap/wcatwc.cer

## 1.6 Links

http://ntwc.arh.noaa.gov/cap/documents/CAP-TSU-v1.1.pdf (this document)

http://docs.oasis-open.org/emergency/edxl-cap1.2-au/v1.0/cs01/edxl-cap1.2-au-v1.0-cs01.html

http://capan.ca/uploads/CAP-CP/CAP-CP_Intro_Rules_Beta_0.4.pdf

http://docs.oasis-open.org/emergency/cap/v1.2/CAP-v1.2-os.html

http://www.w3.org/TR/xmldsig-core/

https://www.oasis-open.org/

http://docs.oasis-open.org/emergency/cap/v1.2/ipaws-profile/v1.0/cap-v1.2-ipaws-profile-v1.0.html

## 1.7 Sample CAP-TSU Documents

Sample CAP-TSU version 1.1 documents are available at:

| Link | Description |
|---|---|
| http://ntwc.arh.noaa.gov/cap/v1.1/SEAK71CAP.xml | Tsunami Seismic Information Statements for Alaska |
| http://ntwc.arh.noaa.gov/cap/v1.1/SEXX60CAP.xml | Tsunami Seismic Information Statements for PR/VI, US East, Gulf, and Canadian Maritime Provinces |
| http://ntwc.arh.noaa.gov/cap/v1.1/WEAK53CAP.xml | Tsunami Information Statements for AK, BC, and US West Coast |

[2]For more information about the XMLDSIG standard, see the World Wide Web Consortium (W3C) recommendation – http://www.w3.org/TR/xmldsig-core/. Also, see 3.3.4.1 Digital Signatures in the CAP 1.2 specification.

| | |
|---|---|
| http://ntwc.arh.noaa.gov/cap/v1.1/WEPA41CAP1.xml<br><br>http://ntwc.arh.noaa.gov/cap/v1.1/WEPA41CAP2.xml<br><br>http://ntwc.arh.noaa.gov/cap/v1.1/WEPA41CAP3.xml<br><br>http://ntwc.arh.noaa.gov/cap/v1.1/WEPA41CAP-Obs.xml | Segmented Tsunami Warnings, Watches, and Advisories for<br><br>AK, BC, and US West Coast |

# 2 CAP-TSU Data Dictionary

## 2.1 Key

| Dictionary Name | Explanation |
|---|---|
| | |
| **Element** | CAP XML tag |
| **CAP-TSU Usage** | CAP-TSU usage. The CAP specification may indicate that the specified element usage is *optional*, while the CAP-TSU profile may indicate that usage is *required*. |
| **CAP Value** | Value taken from the CAP 1.2 specification. If no value is specified by CAP 1.2, then the phrase “User defined” will be used. |
| **CAP Description** | Short description of the element from the CAP 1.2 specification. |
| **CAP-TSU Comments** | Describes how the element is composed for the CAP-TSU profile and any applicable comments. |
| **CAP Comments** | Applicable comments from the CAP 1.2 specification |
| **CAP-TSU Example** | A CAP-TSU profile example for the specified element |

NOTE: The CAP <parameter> element and CAP-TSU usage will be documented in section 3, of this document.

## 2.2 <event>

| | |
|---|---|
| **Element** | <event> |
| **CAP-TSU Usage** | **REQUIRED** |
| **CAP Value** | User defined |
| **CAP Description** | The text denoting the type of the subject event of the alert message (REQUIRED). |
| **CAP-TSU Comments** | The constant 'Tsunami' |
| **CAP Comments** | |
| **CAP-TSU Example** | <event>Tsunami</event> |

## 2.3 <eventCode>

| | |
|---|---|
| **Element** | <eventCode> |
| **CAP-TSU Usage** | **REQUIRED** |
| **CAP Value** | User defined |
| **CAP Description** | A system-specific code identifying the event type of the alert message (OPTIONAL). |
| **CAP-TSU Comments** | One of the constants:<br><br>Watch, Warning, Advisory, Information, or Cancellation<br><br>Matches current tsunami system category |
| **CAP Comments** | (1) Any system-specific code for event typing, in the form:<br><br><eventCode><br><valueName>valueName</valueName><br><value>value</value><br></eventCode><br><br>where the content of “valueName” is a user-assigned string designating the domain of the code, and the content of “value” is a string (which may represent a number) denoting the value itself (e.g., valueName ="SAME" and value="CEM").<br><br>(2) Values of “valueName” that are acronyms SHOULD be represented in all capital letters without periods (e.g., SAME, FIPS, ZIP).<br><br>(3) Multiple instances MAY occur within an <info> block. |
| **CAP-TSU Example** | <eventCode><br><valueName>TsunamiSystemCategory</valueName><br><value>Warning</value><br></eventCode> |

## 2.4 <identifier>

| | |
|---|---|
| **Element** | <identifier> |
| **CAP-TSU Usage** | **REQUIRED** |
| **CAP Value** | User defined |

| | |
|---|---|
| **Element** | <identifier> |
| **CAP Description** | The identifier of the alert message (REQUIRED). |
| **CAP-TSU Comments** | Identifer is composed as follows:<br><br>AAAA-NN-BBBBBB where:<br><br>1) AAAA is the four character identification of the tsunami center:<br><br>- PAAQ identifies the National Tsunami Warning Center<br>- PHEB identifies the Pacific Tsunami Warning Center<br><br>2) NN is the bulletin number<br><br>3) BBBBBB is a unique identifier automatically generated by the tsunami warning computer system. This unique identifier is used internally, to identify a particular seismic/tsunami event. |
| **CAP Comments** | (1) A number or string uniquely identifying this message, assigned by the sender.<br><br>(2) MUST NOT include spaces, commas or restricted characters (< and &). |
| **CAP-TSU Example** | A CAP-TSU document, issued by NTWC for bulletin number 1 with a unique identifier of 'maiqdx':<br><br><identifier>PAAQ-1-maiqdx</identifier> |

## 2.5 <sender>

| | |
|---|---|
| **Element** | <sender> |
| **CAP-TSU Usage** | **REQUIRED** |
| **CAP Value** | User defined |
| **CAP Description** | The identifier of the alert message (REQUIRED) |
| **CAP-TSU Comments** | Email address of the tsunami center that issued the alert:<br><br>1) wcatwc@noaa.gov<br>2) webmaster@ptwc.noaa.gov |
| **CAP Comments** | 1) Identifies the originator of this alert. Guaranteed by assigner to be unique globally; e.g., may be based on an Internet domain name.<br><br>2) MUST NOT include spaces, commas or restricted characters (< and &). |

| | |
|---|---|
| **Element** | <sender> |
| | |
| **CAP-TSU Example** | A CAP-TSU document, issued by NTWC:<br><br><sender>wcatwc@noaa.gov</sender> |

## 2.6 <sent>

| | |
|---|---|
| **Element** | <sent> |
| **CAP-TSU Usage** | **REQUIRED** |
| **CAP Value** | Timestamp |
| **CAP Description** | The time and date of the origination of the alert message (REQUIRED). |
| **CAP-TSU Comments** | The bulletin issue time will be used to compose the <sent> time/date |
| **CAP Comments** | (1) The date and time SHALL be represented in the DateTime Data Type (See Implementation Notes) format (e.g., "2002-05-24T16:49:00-07:00" for 24 May 2002 at 16:49 PDT).<br><br>(2) Alphabetic timezone designators such as “Z” MUST NOT be used. The timezone for UTC MUST be represented as “-00:00”. |
| **CAP-TSU Example** | A CAP-TSU document, issued 18 September 2012 at 59 minutes past midnight UTC.<br><br><sent>2012-09-18T00:59:00-00:00</sent> |

## 2.7 <source>

| | |
|---|---|
| **Element** | <source> |
| **CAP-TSU Usage** | **REQUIRED** |
| **CAP Value** | User defined |
| **CAP Description** | The text identifying the source of the alert message (OPTIONAL). |
| **CAP-TSU Comments** | Identifier of the tsunami center that issued the alert:<br><br>1) NTWC<br>2) PTWC |
| **CAP Comments** | The particular source of this alert; e.g., an operator or a specific device. |

| | |
|---|---|
| **Element** | <source> |
| | |
| **CAP-TSU Example** | A CAP-TSU document, issued by NTWC:<br><br><source>PAAQ</source> |

## 2.8 <code>

| | |
|---|---|
| **Element** | <code> |
| **CAP-TSU Usage** | **REQUIRED** |
| **CAP Value** | User defined |
| **CAP Description** | The code denoting the special handling of the alert message (OPTIONAL). |
| **CAP-TSU Comments** | profile:CAP-TSU:N.N<br><br>Where<br><br>1) “profile:CAP-TSU:” is a string constant<br>2) N.N is the major/minor version of CAP-TSU |
| **CAP Comments** | (1) Any user-defined flag or special code used to flag the alert message for special handling.<br><br>(2) Multiple instances MAY occur. |
| **CAP-TSU Example** | <code>profile:CAP-TSU:1.1</code> |

## 2.9 <info>

| | |
|---|---|
| **Element** | <info> |
| **CAP-TSU Usage** | **REQUIRED** |
| **CAP Value** | Various CAP sub-elements |
| **CAP Description** | The container for all component parts of the info sub-element of the alert message (OPTIONAL) |
| **CAP-TSU Comments** | Depending upon the alert (e.g., Watch, Warning, etc), multiple <info> blocks may be present. Each <info> block applies to the same alert, but indicates that different segments may be in a different status.<br><br>For example - the coasts of Alaska and British Columbia (BC) may be in a Watch, while the coastal segment from the BC/Washington |

| | |
|---|---|
| **Element** | <info> |
| | border to the California/Mexico border may be in a Warning. In this instance, there would be two <info> blocks. |
| **CAP Comments** | 1) Multiple occurrences are permitted within a single <alert>. If targeting of multiple <info> blocks in the same language overlaps, information in later blocks may expand but may not override the corresponding values in earlier ones. Each set of <info> blocks containing the same language identifier SHALL be treated as a separate sequence.<br><br>(2) In addition to the specified sub-elements, MAY contain one or more<br><br><resource> blocks and/or one or more <area> blocks. |
| **CAP-TSU Example** | See section 1.7, this document for links to complete examples. |

## 2.7 <senderName>

| | |
|---|---|
| **Element** | <senderName> |
| **CAP-TSU Usage** | **REQUIRED** |
| **CAP Value** | User defined |
| **CAP Description** | The text identifying the source of the alert message (OPTIONAL). |
| **CAP-TSU Comments** | Name of the tsunami center that issued the alert:<br><br>1) NWS National Tsunami Warning Center Palmer AK<br>2) NWS Pacific Tsunami Warning Center Ewa Beach HI |
| **CAP Comments** | The particular source of this alert; e.g., an operator or a specific device. |
| **CAP-TSU Example** | A CAP-TSU document, issued by NTWC:<br><br><senderName>NWS National Tsunami Warning Center Palmer AK</senderName> |

# 3 CAP-TSU Parameter Elements

This section identifies the various CAP-TSU <parameter> elements that are used in the CAP-TSU profile.

## 3.1 Key

| Parameter Name | Explanation |
|---|---|
| | |
| **Cap <valueName>** | This is the CAP-TSU tag name that is used in the parameter group.<br><br>Example:<br><br><value>EventLocationName</value> |
| **Type** | The data type for the contents of <value><br><br>Can be:<br><br>Alpha [a-z,A-Z]<br>Alpha/Numeric [a-z,A-Z,0-9, special chars]<br>Numeric [0-9]<br>Double [0.0-9.0] |
| **CAP <value> description** | Short description of what the contents of <value> constitute |
| **Example** | An example of CAP-TSU <value> |
| **Always included** | Some <parameters> may/may not be included (e.g., observed wave heights)<br><br>1) Yes – always included<br>2) No – not always included |

## 3.2 EventLocationName

| | |
|---|---|
| **CAP <valueName>** | EventLocationName |
| **Type** | Alpha/Numeric string |
| **CAP <value> description** | Short text description of where the seismic event occurred |
| **Example** | 45 miles/72 Km SE of Amukta Pass, Alaska |
| **Always included** | Yes |

### 3.3 EventPreliminaryMagnitude

| | |
|---|---|
| **CAP valueName** | EventPreliminaryMagnitude |
| **Type** | Double |
| **CAP value description** | Preliminary magnitude of the seismic event |
| **Example** | 7.1 |
| **Always included** | Yes |

### 3.4 EventPreliminaryMagnitudeType

| | |
|---|---|
| **CAP <valueName>** | EventPreliminaryMagnitudeType |
| **Type** | Alpha string |
| **CAP <value> description** | Type of preliminary magnitude of the seismic event.<br><br>Values:<br><br>**Magnitude Type**<br>Duration (Md)<br>Local (ML)<br>Surface wave (Ms)<br>Moment (Mw)<br>Energy (Me)<br>Moment (Mwp[3])<br>Body (Mb)<br><br>See http://earthquake.usgs.gov/earthquakes/glossary.php for more details/explanation. |
| **Example** | Mwp |
| **Always included** | Yes |

### 3.5 EventOriginTime

| | |
|---|---|
| **CAP <valueName>** | EventOriginTime |
| **Type** | Alpha/Numeric string |
| **CAP <value>** | Time stamp when the seismic event was originated |

[3]Mwp is the moment magnitude computed on P waves

| | |
|---|---|
| **description** | |
| **Example** | 2011-09-02T10:55:54-00:00 |
| **Always included** | Yes |

### 3.6 EventDepth

| | |
|---|---|
| **CAP <valueName>** | EventDepth |
| **Type** | Alpha/Numeric string |
| **CAP <value> description** | Preliminary depth of the seismic event |
| **Example** | 39 kilometers |
| **Always included** | Yes |

### 3.7 EventLatLon

| | |
|---|---|
| **CAP <valueName>** | EventLatLon |
| **Type** | Alpha/Numeric string |
| **CAP <value> description** | Comma separated string with preliminary latitude and longitude of the seismic event in decimal form.<br><br>Northern latitudes are positive, southern latitudes are negative.<br>Eastern longitudes are positive, western longitudes are negative.<br><br>Note: radius of 0.000 signifies a point |
| **Example** | 51.800,-171.400 0.000 |
| **Always included** | Yes |

### 3.8 VTEC

| | |
|---|---|
| **CAP <valueName>** | VTEC |
| **Type** | Alpha/Numeric string |
| **CAP <value> description** | The Valid Time Event Code (VTEC) enables alert providers and vendors to automate and tailor the product stream delivered to their clients.<br><br>See http://www.weather.gov/om/vtec/ for more info on VTEC |
| **Example** | /T.CON.PAAQ.TS.W.0079.110902T1545Z-110902T1645Z/ |
| **Always included** | No |

| | |
|---|---|
| | - Tsunami Information Statement |

### 3.9 NWSUGC

| | |
|---|---|
| **CAP <valueName>** | NWSUGC |
| **Type** | Alpha/Numeric string |
| **CAP <value> description** | The Universal Geographic Code (UGC) typically specifies:<br><br>1) The affected geographic area of the product or product segment, typically by state, county (or parish or independent city), or unique NWS zone (land or marine).<br>2) The product expiration time .<br><br>See NWSI 10-1702 (www.nws.noaa.gov/directives/sym/pd01017002curr.pdf) for more details on the Universal Geographic Code |
| **Example** | AKZ185-187-021645- |
| **Always included** | No<br><br>- Tsunami Information Statement |

### 3.10 ProductDefinition

| | |
|---|---|
| **CAP <valueName>** | ProductDefinition |
| **Type** | Alpha/Numeric string |
| **CAP <value> description** | Short text paragraph describing the tsunami product being issued. |
| **Example** | Tsunami warnings mean that a tsunami with significant widespread inundation is imminent, expected, or occurring. Warnings indicate that widespread dangerous coastal flooding accompanied by powerful currents is possible and may continue for several hours after the initial wave arrival. |
| **Always included** | No |

### 3.11 Product ID (E.G., WEPA41, SEUS71, etc)

| | |
|---|---|
| **CAP <valueName>** | Product ID (e.g., WEPA41, SEUS71, etc) |
| **Type** | Alpha/Numeric string |
| **CAP <value> description** | Alpha/Numeric string with the product ID<br><br>See http://ntwc.arh.noaa.gov/?page=product_list for a complete list of available products. |

| | |
|---|---|
| **Example** | <valueName>WEPA41</valueName><br><br>Where, WEPA41 is the product ID and <value> has the product description:<br><br><value>Tsunami Warnings, Watches, and Advisories for AK, BC, and US West Coast</value> |
| **Always included** | Yes |

### 3.12 predictedArrivalTime[4]: “[location]**”**

| | |
|---|---|
| **CAP <valueName>** | predictedArrivalTime: “[location]**”** |
| **Type** | Alpha/Numeric string |
| **CAP <value> description** | 1) [location] - Alpha/Numeric string identifying the location of the predicted arrival time.<br><br>2) The value has the actual predicted time as:<br><br>YYYY-MM-DDTHH:MM:SS-hhmm[5]<br><br>Where:<br><br>YYYY — four-digit year<br>MM — two-digit month (01=January, etc.)<br>DD — two-digit day of month (01 through 31)<br>HH — two digits of hour (00 through 23) (am/pm NOT used)<br>MM — two digits of minute (00 through 59)<br>SS — two digits of second (00 through 59)<br>hh — Timezone hours offset from UTC<br>mm — Timezone minutes offset from UTC<br><br>Notes:<br><br>1) The location serves as a key to link predicted arrival time to the predicted wave height.<br><br>2) Predicted arrival times will NOT be included, if observed values are available. |
| **Example** | <valueName>predictedArrivalTime: “Atka, Alaska”</valueName><br><value>2011-09-02T03:29:00-0800</value> |

[4] predictedArrivalTime, predictedWaveHeight, observedArrivalTime, and observedWaveHeight are placed within the applicable <info> block.

[5] See http://www.w3.org/TR/NOTE-datetime

| | |
|---|---|
| **Always included** | No<br><br>- Predicted arrival time may not be available<br>- Observed arrival time is available |

### 3.13 predictedWaveHeight: “[location]”

| | |
|---|---|
| **CAP <valueName>** | predictedWaveHeight: “[location]” |
| **Type** | Alpha/Numeric string |
| **CAP <value> description** | 1) [location] - Alpha/Numeric string identifying the location of the predicted wave height.<br><br>2) <value> has the actual predicted wave height in both meters and feet and takes the form:<br><br>N.NNNm N.NNNft<br><br>where N.NNN is the height and m indicates height is in meters, ft indicates height is in feet.<br><br>1) The location serves as a key to link predicted arrival time to the predicted wave height.<br><br>2) Predicted wave height will NOT be included, if observed values are available. |
| **Example** | <valueName>predictedWaveHeight: “Attu, Alaska”</valueName><br><value>0.750m 2.461ft</value> |
| **Always included** | No<br><br>- Predicted wave height might not be available<br>- Observed wave height is available |

### 3.14 observedArrivalTime: “[location]”

| | |
|---|---|
| **CAP <valueName>** | observedArrivalTime: “[location]” |
| **Type** | Alpha/Numeric string |
| **CAP <value> description** | 1) [location] - Alpha/Numeric string identifying the location of the observed arrival time.<br><br>2) The value has the actual observed time as:<br><br>YYYY-MM-DDTHH:MM:SS-hhmm[6] |

[6] See http://www.w3.org/TR/NOTE-datetime

| | |
|---|---|
| | Where:<br><br>YYYY — four-digit year<br>MM — two-digit month (01=January, etc.)<br>DD — two-digit day of month (01 through 31)<br>HH — two digits of hour (00 through 23) (am/pm NOT used)<br>MM — two digits of minute (00 through 59)<br>SS — two digits of second (00 through 59)<br>hh — Timezone hours offset from UTC<br>mm — Timezone minutes offset from UTC<br><br>Notes:<br><br>1) The location serves as a key to link observed arrival time to the observed wave height.<br><br>2) Predicted arrival time will NOT be included, if observed values are available. |
| **Example** | <valueName>observedArrivalTime: “Atka, Alaska”</valueName><br><value>2011-09-02T04:52:00-0800</value> |
| **Always included** | No<br><br>- No observed arrival times available |

3.15 observedWaveHeight: “[location]**”**

| | |
|---|---|
| **CAP <valueName>** | observedWaveHeight: “[location]**”** |
| **Type** | Alpha/Numeric string |
| **CAP <value> description** | 1) [location] - Alpha/Numeric string identifying the location of the observed wave height.<br><br>2) <value> has the actual observed wave height in both meters and feet and takes the form:<br><br>N.NNNm N.NNNft<br><br>where N.NNN is the height and m indicates height is in meters, ft indicates height is in feet.<br><br>1) The location serves as a key to link observed arrival time to the observed wave height.<br><br>2) Predicted wave height will NOT be included, if observed values are |

| | |
|---|---|
| | available. |
| **Example** | <valueName>predictedWaveHeight: “Attu, Alaska”</valueName><br><value>0.750m 2.461ft</value> |
| **Always included** | No<br><br>- No observed wave heights are available |

### 3.16 CMAMtext

| | |
|---|---|
| **CAP <valueName>** | CMAMtext |
| **Type** | Alpha/Numeric string |
| **CAP <value> description** | Short text bulletin intended for Commercial Mobile Alert System (CMAS) dissemination. This is part of the iPAWS profile.<br><br>Text length is limited to 90 characters. |
| **Example** | Tsunami danger on the coast. Go to high ground or move inland. Check local media. -NWS |
| **Always included** | No<br><br>- Tsunami Information Statement |