

CAP Implementation at MET Norway (cooperation with NVE and NRK) Helen Korsmo and Gjermund Haugen



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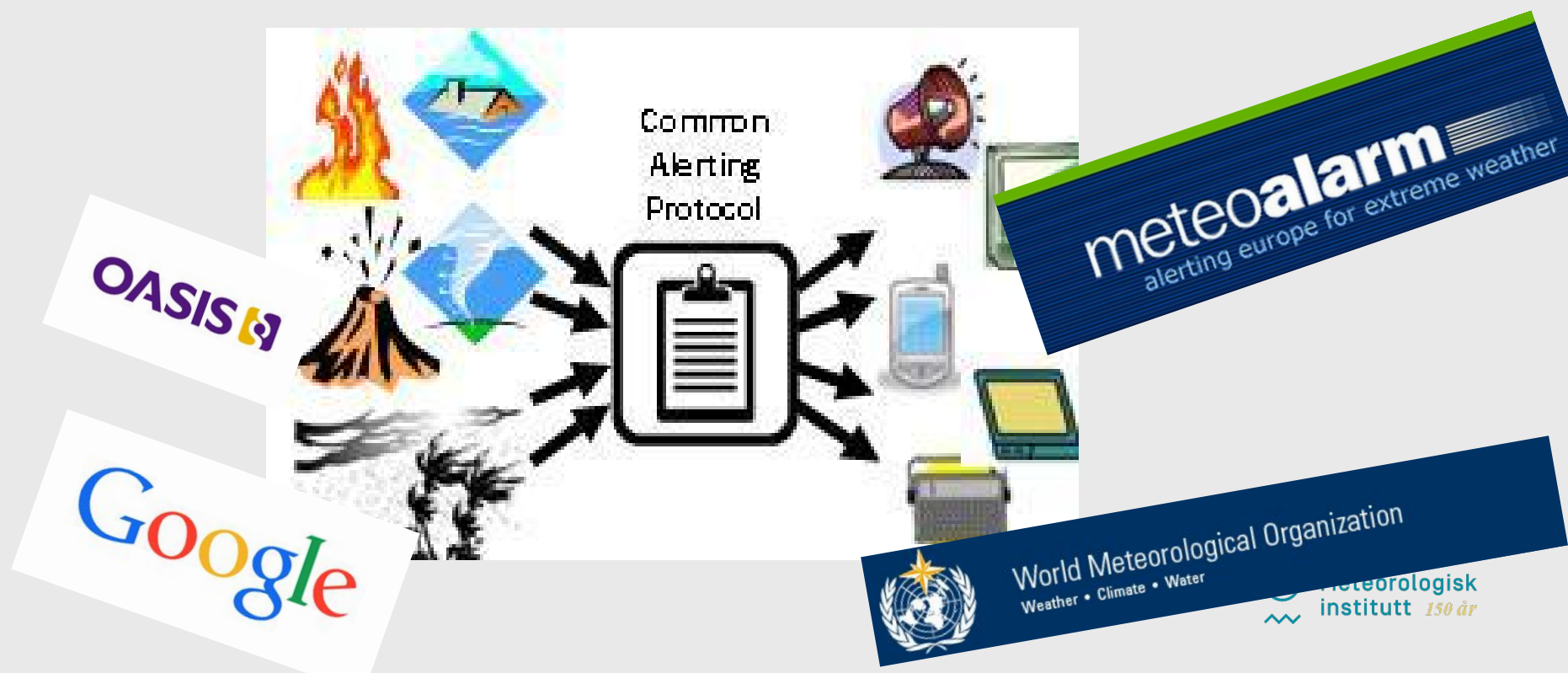
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Motivation for introducing CAP

MET started work on implementing CAP in 2015 after Bård Fjukstad had attended the CAP workshop in Rome.

Advantages in introducing CAP included

- Standard format – can be distributed to many channels
- Used by WMO, Meteoalarm, AccuWeather and Google
- Impact based forecasting, recommended by WMO



Danger warnings at MET

- Extreme weather warnings:
 - Our most important responsibility
 - The storms are given a name (incidentName)
 - From 1994 MET has an Extreme Weather Plan
- OBS-warnings
 - Weather that can have severe consequences
 - Be aware
 - Difficult driving conditions, risk of forest fire etc
- Gale warnings
 - Issued for coastal and marine areas at gale or near gale.



2016: Issuing CAP for OBS-warnings and gale warnings

- Started issuing CAP for the less severe warnings to get some experience with CAP
- Used existing software that was already in use at MET. A python-script was made to convert from old xml-format to CAP.
- Produced in parallel with our existing warnings, since not all system/users could start consuming CAP immediately.
- Published as an RSS-feed at our external api.

RSS-feed at alert.met.no



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MET Norway Weather alerts

Weather alerts in English from the Norwegian Meteorological Institute

[Heavy rainfall, Agder, Telemark and Vestfold, 08 September 00:00 to 09 September 00:00.](#)

September 7, 2017, 9:44 AM

MSGTYPE: Alert

Heavy rainfall

Area: Agder, Telemark and Vestfold

Forecast: Locally large amounts of precipitation, mainly in inner areas. Estimated up to 50-70 mm in 24 hours. Heaviest precipitation Friday afternoon.

Valid time: From 2017-09-08 00:00 UTC to 2017-09-09 00:00 UTC

[Heavy rainfall, Nordenskiöld Land på Spitsbergen, 02 September 19:00 to 03 September 15:00.](#)

September 2, 2017, 9:59 AM

MSGTYPE: Alert

Heavy rainfall

Area: Nordenskiöld Land på Spitsbergen

Forecast: From Saturday evening and until Sunday afternoon expected locally heavy precipitation, 10-25 mm in 24 hours on Northenskiöld Land. Further north on Spitsbergen and around the Ny-Ålesund-area expected around 20-40 mm in 24 hours. The largest amount of precipitation is expected to come early Sunday morning.

Valid time: From 2017-09-02 19:00 UTC to 2017-09-03 15:00 UTC



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Filters:

- On language: <https://alert.met.no/feed?lang=en>
- On event type: <https://alert.met.no/feed?lang=en&event=rain>
- On validity: <https://alert.met.no/feed?show=all>
- On coordinates:

<https://alert.met.no/feed?show=all&lat=59.495278&lon=10.248611&event=rain>




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yr.no - an enormous success!




- Weather and weather forecasts are extremely important for Norwegians.
- yr.no is the most important channel for communicating MET's weather forecasts. Forecasts for 10 million places worldwide. Over 9 million users per week.
- Most popular weather web site in Norway, since 2007
- 5th largest weather web site in the world
- South Africa (160 000 users)
- Cooperation between MET Norway and the Norwegian Broadcasting Company, NRK.
- MET provides the weather data and the professional content, while NRK provides the presentation and design.

CAP warnings at Yr






 Nearby

Hammerfest lufthavn

Hammerfest, Finnmark (Norway), elevation 8m

[List](#) [Graph](#) [Precip. Map](#)



No precipitation expected next 90 minutes

?

Today, Sep. 14



Tomorrow, Sep. 15



Saturday, Sep. 16



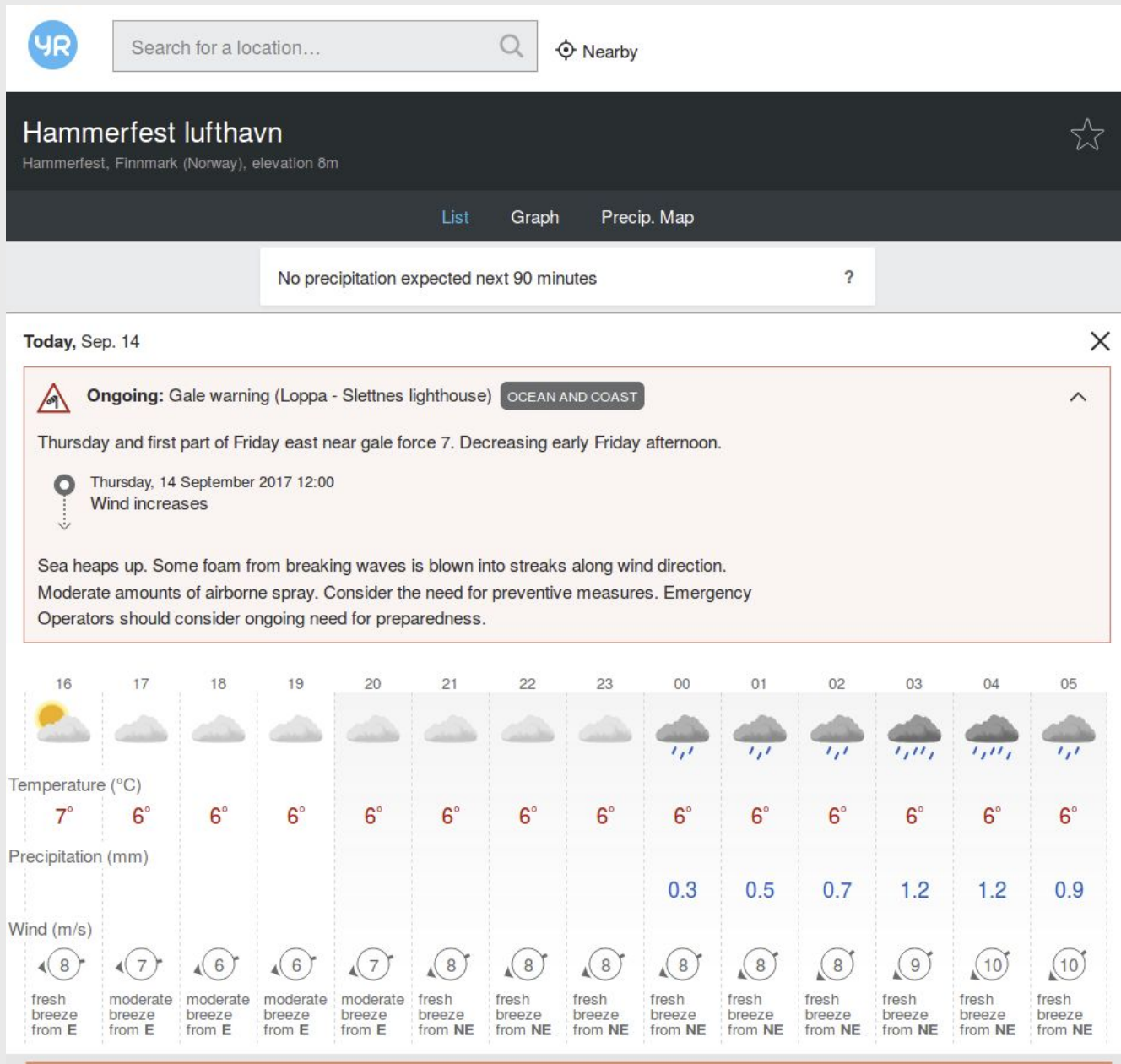
Sunday, Sep. 17



Monday, Sep. 18



CAP warnings at Yr (detailed)



Cooperation with NVE

- NVE (The Norwegian Water Resources and Energy Directorate) forecasts floods, landslide, and snow avalanches
- NVE and MET cooperate by distributing and use each others forecast
- On duty forecasters have dialog when issuing warnings
- Yr shows warnings from MET and NVE on the timeline. <incidents>-tag will be used to collate related warnings (e.g. rain and flood)
- Working group on harmonizing the warnings and agree on the use of CAP started in 2016. (decided on our own CAP dialect)
- MET can issue rainFlood warnings



Harmonizing event types MET/NVE

```

- <info>
  <language>en-GB</language>
  <category>Met</category>
  <event>Rain</event>
  <responseType>Monitor</responseType>
  <urgency>Future</urgency>
  <severity>Moderate</severity>
  <certainty>Likely</certainty>
- <eventCode>
  <valueName>eventType</valueName>
  <value>rain</value>
</eventCode>

```

<u>eventCode</u>	<u>event, Norsk</u>	<u>event, Engelsk</u>	<u>Meteoalarm-awareness</u>	<u>Owner</u>
wind	Vind	Wind	1; Wind	MET
gale	Kuling	Gale	1; Wind	MET
rain	Regn	Rain	10; rain	MET
snow	Snø	Snow	2; snow-ice	MET
rainFlood	Styrtregn	Rain flood	13; rain-flood	MET
thunder	Torden	Thunderstorm	3; Thunderstorm	MET
blowingSnow	Snøfokk	Blowing snow	2; snow-ice	MET
stormSurge	Stormflo	Storm Surge	7; coastalevent	MET
polarLow	Polare lavtrykk	Polar low		MET
drivingConditions	Vanskelige kjøreforhold	Difficult driving conditions	2; snow-ice	MET
forestFire	Skogbrannfare	Forest fire danger	8; forest-fire	MET
icing	Ising	Icing	7; coastalevent	MET
avalanches	Snøskred	avalanches	9; avalanches	NVE
flood	Flom	Flood	12; flooding	NVE
landslide	Jordskred	Landslide		NVE

Extra parameters MET/NVE CAP

```
-<instruction>
  Consider the need for preventive measures. Emergency Operators should consider ongoing need for preparedness.
</instruction>
-<web>
  https://www.met.no/vaer-og-klima/farevarsel-og-ekstra
</web>
<contact>https://www.met.no/en/contact-us</contact>
-<parameter>
  <valueName>eventEndingTime</valueName>
  <value>2017-09-09T00:00:00+00:00</value>
</parameter>
-<parameter>
  <valueName>consequences</valueName>
  <value>
    Risk of storm water in urban areas, local flooding, stream bank erosion, changing waterways, shallow landslides at locations impacted by precipitation.
  </value>
</parameter>
-<parameter>
  <valueName>eventAwarenessName</valueName>
  <value>Heavy rainfall</value>
</parameter>
-<parameter>
  <valueName>awareness_level</valueName>
  <value>2; yellow; Moderate</value>
</parameter>
-<parameter>
  <valueName>awarenessSeriousness</valueName>
  <value>Challenging situation</value>
</parameter>
-<parameter>
  <valueName>awareness_type</valueName>
  <value>10; rain</value>
</parameter>
-<parameter>
  <valueName>returnPeriod</valueName>
  <value>Nær 5 år returperiode i vestre del av Telemark</value>
</parameter>
-<parameter>
  <valueName>awarenessResponse</valueName>
  <value>Be aware</value>
</parameter>
-<parameter>
  <valueName>geographicDomain</valueName>
  <value>land</value>
</parameter>
```

eventEndingTime: when the event is expected to end

consequences: used in addition to instruction

geographicDomain: land or marine, indicates where the warning is valid

Awareness level

Severity \ Certainty	Minor	Moderate (Exposed objects)	Severe (General damage)	Extreme (Extreme damage)
Likely/Observed				
Possible (<50%)				
Unlikely (<5%)				

Discussions/questions about CAP usage

- How many <info> blocks can one CAP contain? Can warnings for different languages, locations, time blocks be in the same CAP <alert> but different <info> blocks or should we create separate CAPS for these?
- How to use <effective> and <onset>? When updating a CAP does <onset> mean the time when the storm actually started or is it the beginning of the current warning/danger level.
- When should <effective> be different from <sent>? MET would always set effective=sent, while NVE issues three warnings for three next days, each with a different effective (but same onset).
- How to Cancel events? We will normally set the expires to be the time that the alert ends and is no longer valid, but what if the event is over sooner than expected? Google suggests issuing an Update with responseType allClear, but what would be the difference between this and issuing a Cancel warning?
- How to use the <area> element? We prefer to use the polygon for indicating the exact location of the affected area, however we also want to give the geoCode for the affected counties. This is usually a much larger area.
- Several CAP alert issued for overlapping areas, which one is valid? F.ex an area with severity extreme inside an area with severity severe?
- Why does Meteoalarm want CAP alerts when there are no warnings?

Plans ahead

- Improved tools for issuing CAP
 - Make it possible for the meteorologist to draw affected areas as polygons. With short and unambiguous areaDesc
- Push CAP to users in affected areas
- Halo (our site for authorities)
- MET have suggested CAP to be a native format in the most common Norwegian crisis management tool
- CAP for aviation warnings
- User documentation for non-IT-users
- Investigate Filtered Alert Hub for local and regional authorities

Filtered Alert Hub subscription for a regional authority in northern Norway

```
{
  "subscriptions": [
    {
      "subscription": {
        "subscriptionId": "not-gale-county-troms-country-no-lang-en",
        "subscriptionName": "Official Public alerts except gales in English for Troms in Norway",
        "subscriptionUrl": "https://alert-feeds.s3.amazonaws.com/country-no-lang-en/rss.xml",
        "languageOnly": "en",
        "highPriorityOnly": false,
        "officialOnly": true,
        "xpathFilterId": "actual-public-troms-not-gale-auth",
        "xpathFilter": "//cap:status='Actual' and //cap:scope='Public' and //cap:event!='Gale' and //cap:event!='Kuling'",
        "areaFilterId": "country-no",
        "areaFilter": {
          "polygonCoordinates": [ [ 9, 69 ], [ 10, 70 ], [ 11, 70 ], [ 9, 69 ] ],
          "circleCenterRadius": ""
        },
        "feed-rss-xml": "<?xml version='1.0' encoding='UTF-8'?><rss version='2.0' xmlns:atom='http://www.w3.org/2005/Atom'><channel><link rel='alternate' title='RSS' href='https://s3-eu-west-1.amazonaws.com/alert-feeds/country-no-lang-en/rss.xml' type='application/rss+xml' /><title>Latest Official Public alerts in English for Norway</title><link>https://s3-eu-west-1.amazonaws.com/alert-feeds/country-no-lang-en/rss.xml</link><description>This feed lists the most recent Official Public alerts in English for Norway uploaded to the Filtered Alert Hub.</description><language>en</language><copyright>public domain</copyright><pubDate>Thu, 19 Dec 2013 10:31:34 GMT</pubDate><lastBuildDate>Thu, 19 Dec 2013 10:31:34 GMT</lastBuildDate><docs>http://blogs.law.harvard.edu/tech/rss</docs><image><title>Latest Official Public alerts in English for Norway</title><url>https://s3-eu-west-1.amazonaws.com/alert-feeds/country-no-lang-en/logo.jpg</url><link>https://s3-eu-west-1.amazonaws.com/alert-feeds/country-no-lang-en/rss.xml</link></image></channel></rss>"
      }
    ]
  }
}
```

Thank you!

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