



# Interoperability in HNS Spill modelling: a proposal for common model outputs, symbols and styles in Common Operating Pictures (COP's)

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# Context: Why a COP?



Spill Event



Unified Commander



Responders



Public and Stakeholders



...

Planning map



Tactical map



Situation map



All of them need a Map!



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Planning map



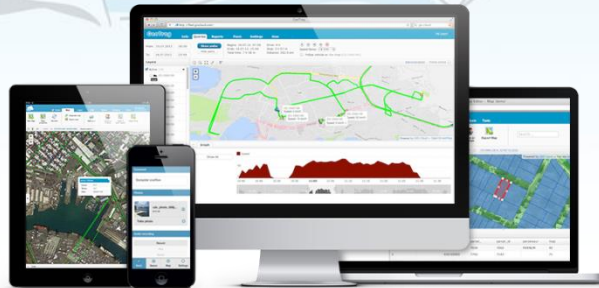
Tactical map



Situation map



- Accurate and timely
- Several sources
- Real-time information
- Accessible everywhere
- Pan, zoom,...
- Understandable



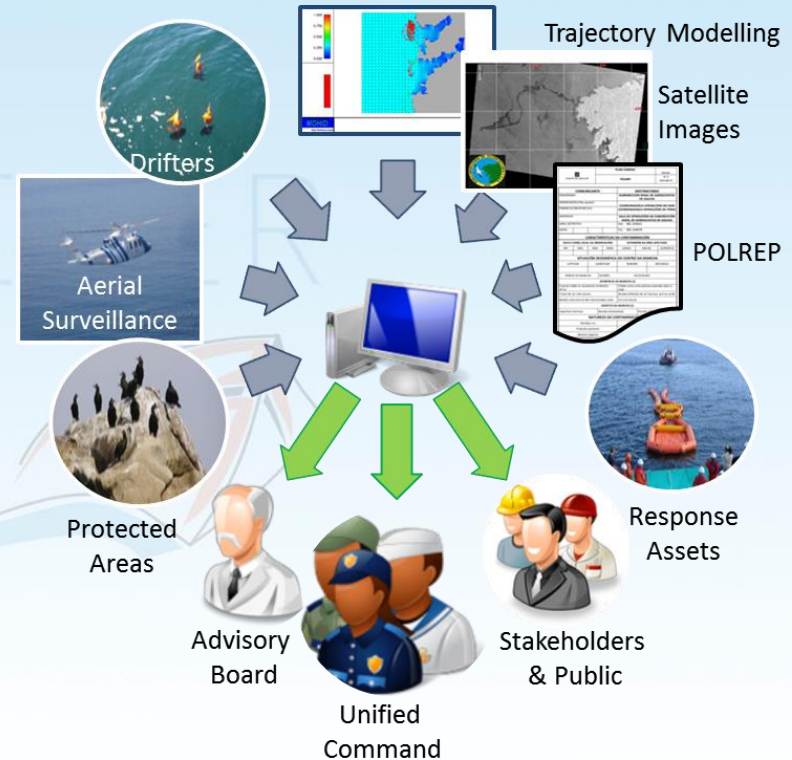
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# Common Operating Picture

A **COP** is:

- a **computing platform** based in **GIS** technology
- provides a single source of **data and information**
- to support **management and response personnel** and other **stakeholders** involved in or affected by an incident

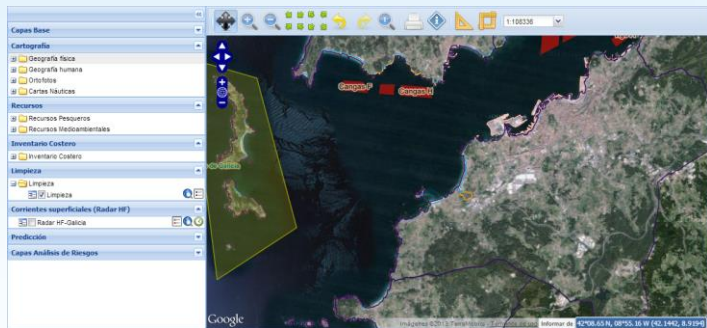


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# COP: No incident time

Projects:

ARCOPOL



Plan CAMGAL COP:  
<http://ww3.intecmar.gal/plancamgal>



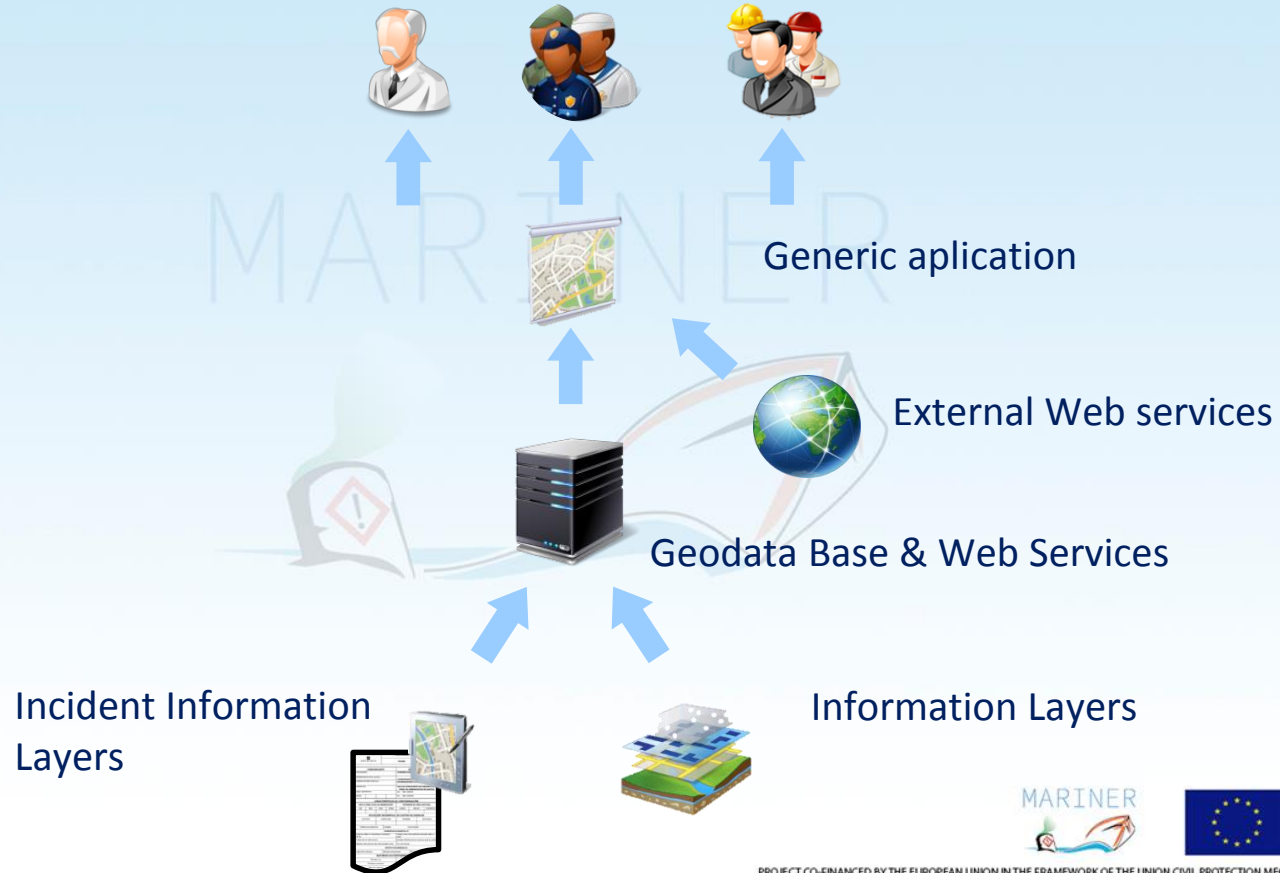
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# COP: During an event

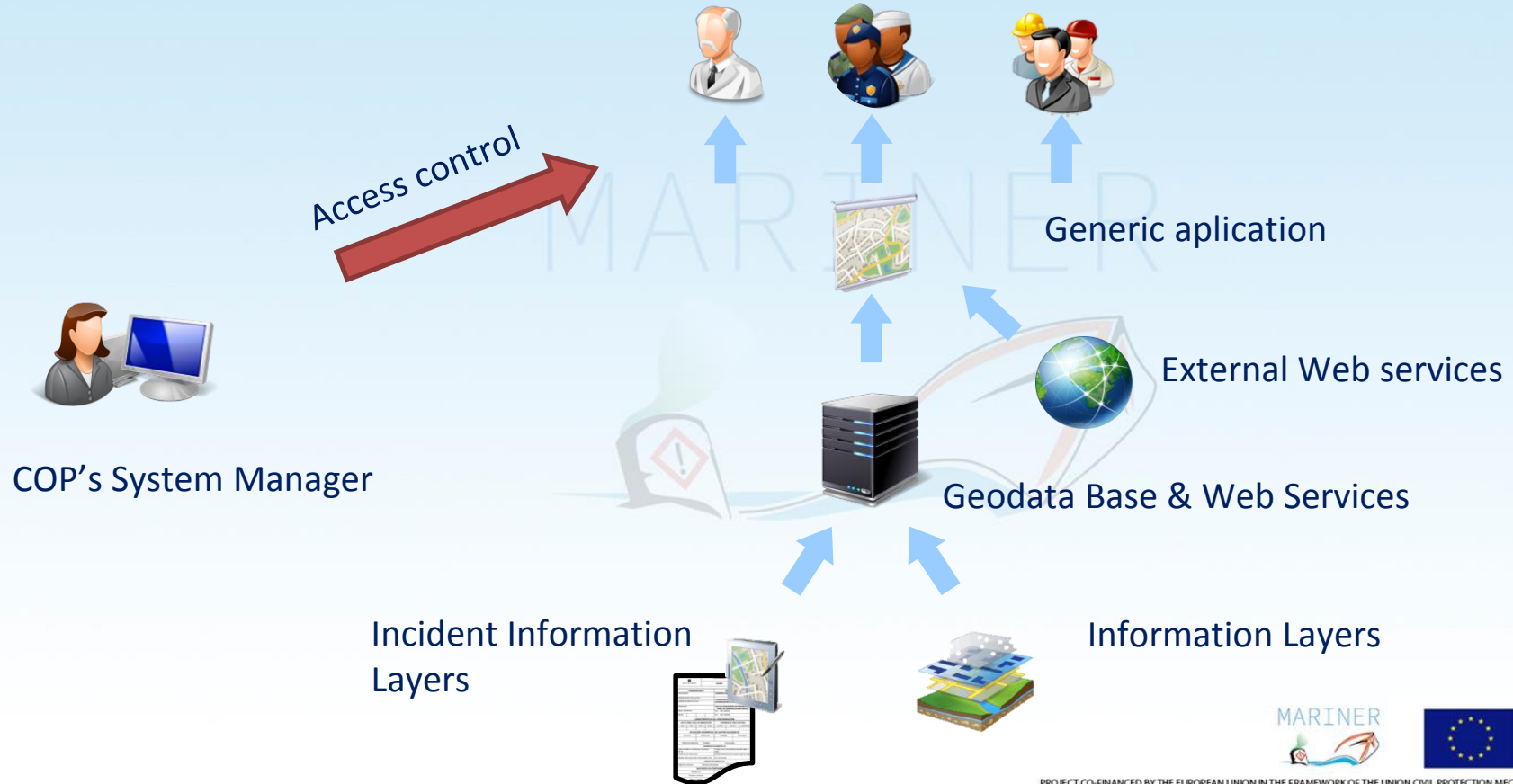




# COP: During an event



# COP: During an event





# COP: During an event



## Map Tools

## Layers Panel

## Map



## POLREP Polygon

## Booms

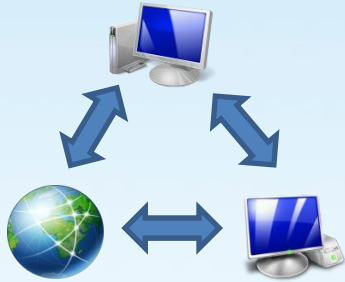
## Spill track forecast

## Forecasted slick

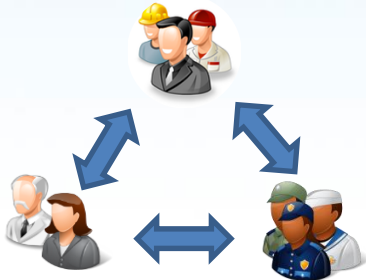
## Drifters tracks

# Interoperability

## Computers:



## Human Beings:

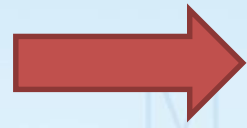
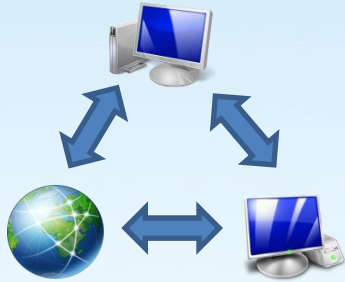


Interoperability is a characteristic of a product or system, whose interfaces are completely understood, to **work with other products or systems**, present or future, in either implementation or access, without any restrictions.

Interoperability is defined as the extent to which **different organisations can work together** coherently as a matter of routine.

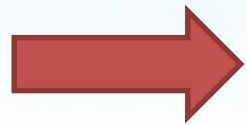
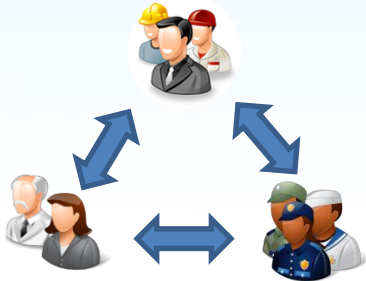
# Interoperability

Computers:



Common formats to share information about HNS incident

Human Beings:



Information about HNS on a COP easy to understand



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# Computers interoperability: HNS GML

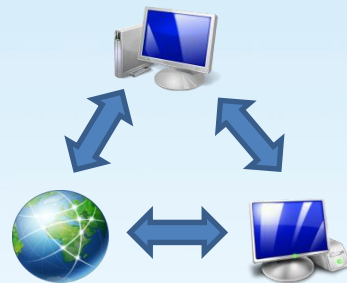
A common format to share information about HNS events between computers.

## Characteristics:

- Standard.
- Autocontent
- With geographic data but not only
- Extensible

## How:

- Based on GML (Geography Markup Language)
- EMSA Clean SeaNet GML



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# Mariner HNS GML

```
<?xml version="1.0" encoding="UTF-8"?>
<HNS:Event xmlns:HNS="http://www.mariner-project.eu/hnaspill" xmlns:gml="http://www.opengis.net/gml" xmlns:ogr="http://ogr.maptools.org/" xmlns:xlink="http://www.w3.org/1999/xlink" xm
  <gml:boundedBy>
    <gml:Envelope srsDimension="2" srsName="urn:ogc:def:crs:EPSG::4326">
      <gml:lowerCorner>-9.281300999999999 42.9571</gml:lowerCorner>
      <gml:upperCorner>-9.277698999999998 42.965262</gml:upperCorner>
    </gml:Envelope>
  </gml:boundedBy>

  <HNS:eventid>e000000001</HNS:eventid>
  <HNS:name>Cason</HNS:name>
  <HNS:initDate>1987-12-05T06:45:00</HNS:initDate>
  <HNS:endDate>1987-12-11T12:00:00</HNS:endDate>
  <HNS:description>Accidente do buque con bandeira de Panama Cason, con algunhas das sustancias das moitas que contemplaba o manifesto de carga, a modo de exemplo</HNS:description>

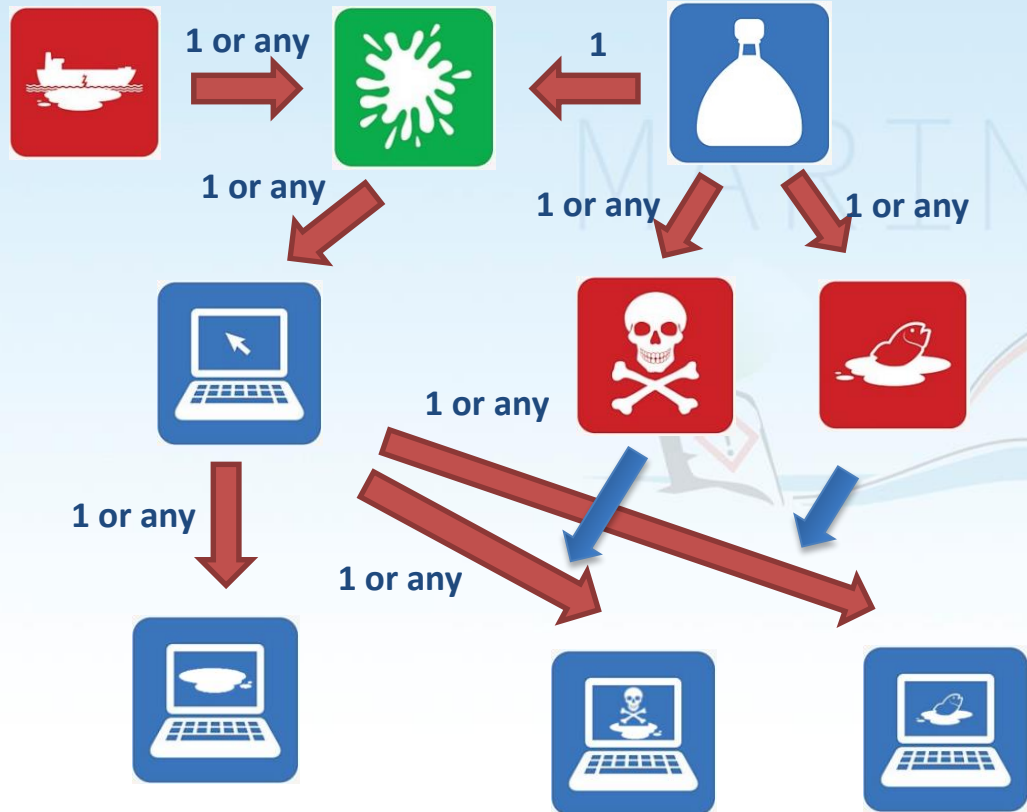
  <gml:featureMember>
    <HNS:Spill gml:id="idvalue10">
      <HNS:spillid>e000000001</HNS:spillid>
      <HNS:initDate>1987-12-10T12:00:00Z</HNS:initDate>
      <HNS:endDate>1987-12-11T12:00:00Z</HNS:endDate>
      <HNS:geometryProperty>
        <gml:Point gml:id="idvalue1" srsDimension="2" srsName="urn:ogc:def:crs:EPSG::4326">
          <gml:pos>-9.2795 42.9571</gml:pos>
        </gml:Point>
      </HNS:geometryProperty>
      <HNS:spatialEmission>POINT ORIGIN</HNS:spatialEmission>
      <HNS:temporalEmission>CONTINUOUS ORIGIN</HNS:temporalEmission>
      <HNS:volume uom="l">253000</HNS:volume>
      <HNS:flow uom=">0.0</HNS:flow>
      <HNS:HNS>
        <HNS:name>Xylene</HNS:name>
        <HNS:CASNumber>1330207</HNS:CASNumber>
        <HNS:ToxicityTestsResults fid="TOX20">
          <HNS:parameter>LC50</HNS:parameter>
          <HNS:concentration uom="mg/l">33</HNS:concentration>
          <HNS:species>
```



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# HNS GML



## Event:

- Init date
- End date
- Location
- Description
- ...

## Spill:

- Init date
- End date
- Location
- Description
- Volume
- ...

## HNS:

- Name
- CAS
- Properties
- ...

## Simulation:

- Name
- Properties
- ...

- Level LOC (AEGL, EPRG,...)

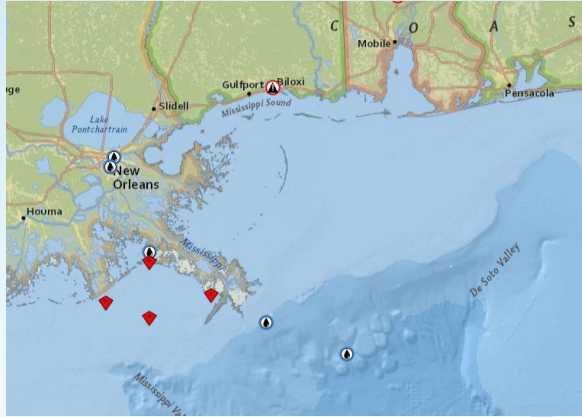
- Toxicity

- Raw Output

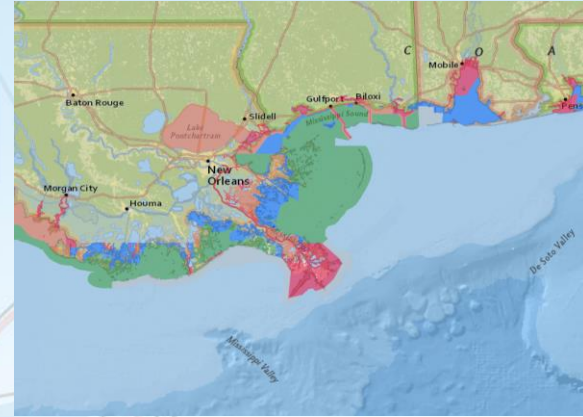
- Derived Output



# Human Interoperability: HNS Symbology and Styles



Symbols



Styles

Any responder should be able to immediately use any and all of the different geo-referenced information without having to decipher it.



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# Symbology

## Several initiatives

- FGDC HSWG Symbol Set
- Canadian Emergency Mapping Symbology
- IPIECA Symbology
- UK Civil Protection Symbology
- US Coast Guards
- NAPSG Foundation

## But they are:

- Mainly for land emergencies
- Immature
- Misleading



Helibase (USCG)



Helibase (IPIECA)



Hotel (IPIECA)



Hospital (NAPSG Foundation)



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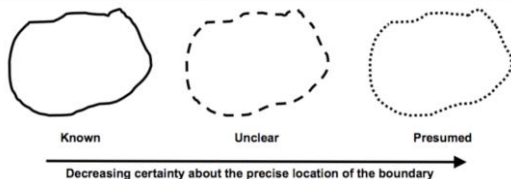
# NAPSG Symbology

## National Alliance for Public Safety GIS

### Reserved shapes

	Hazards	
	Warnings	
	Resources	
	Command System	
	Infrastructure	

### Outline style

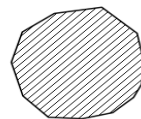


## Extension for HNS

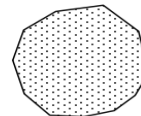
### New symbols:



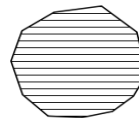
### New styles:



Surface



Column



Bottom

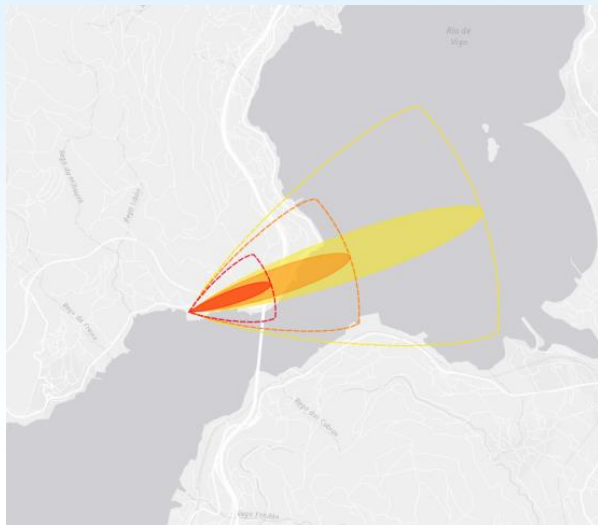


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# Example: Styles

FANDICOSTA fire: 09/05/2016



Atmospheric pollution:  
Threat Levels and  
confident lines



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Thank you!  
Obrigado



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