

HAZRUNOFF

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Incident Response – Protecting the Public

Public Health England
Workshop
xx/xx/xxxx



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Aims

- Define the stages of incident response
- Describe Response Phase for public protection
 - Zoning
 - Mass decontamination
 - Shelter Vs Evacuation
- Describe Risk Communication Approaches,
 - Warning and informing
 - Role of Social Media
- Define Recovery Phase and key actions

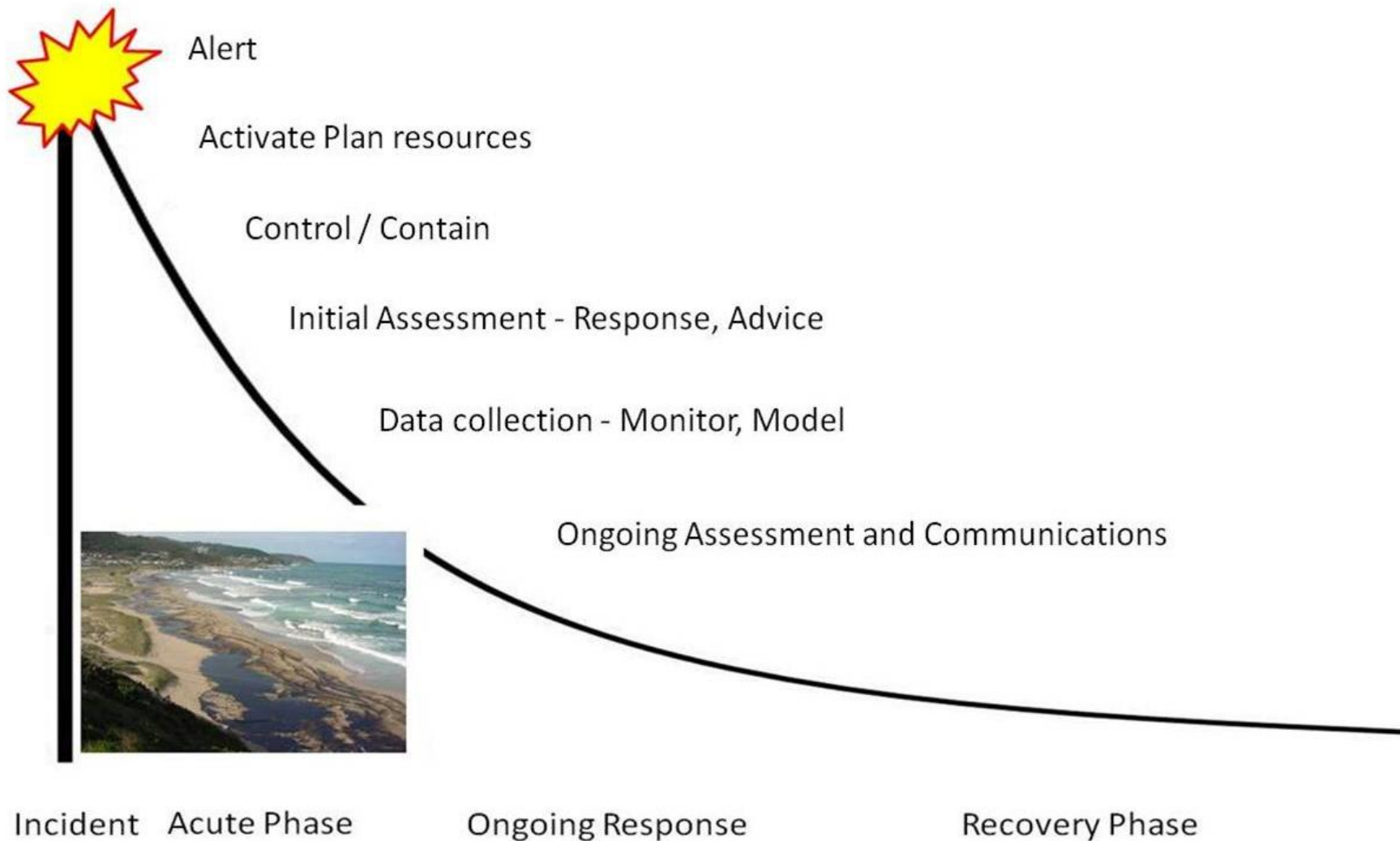


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Incident Phases



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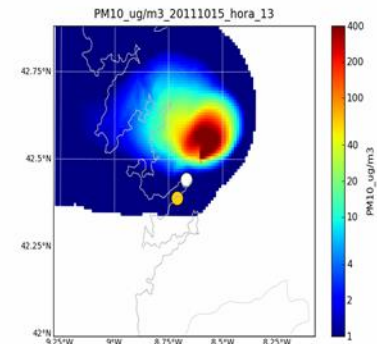
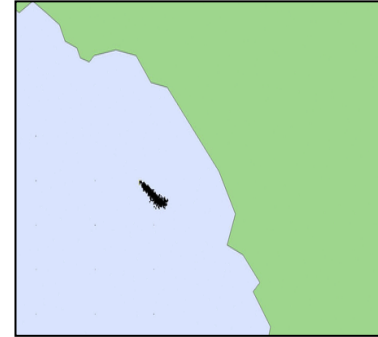
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Public Health Response - Initial Assessments

Initial risk assessment needs to be completed before response can be formulated.

- Key aspects to be determined will include.
- Location of the incident?
- Quantity and type of chemicals involved?
- Location, numbers and types of receptors involved?
- Immediate threats are there casualties?
- Meteorological conditions?
- Resources available and timescales to mobilise these?

A critical aspect of response is to obtain information on conditions on the ground.



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Public Health Response - Immediate Actions

- If an incident occurs the immediate priorities will be to
 - Make area safe (Zoning)
 - Treat / decontaminate casualties
 - Reduce wider exposure by advising people to leave affected areas (evacuation) or stay indoors (shelter in place)
 - Protect sensitive ecosystems and infrastructure



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Zoning

Zoning is a specialised activity influenced by many factors such as the hazards involved, weather conditions, key receptors logistical issues.



Hot Zone:
Exclusion area
Responders only with full PPE.



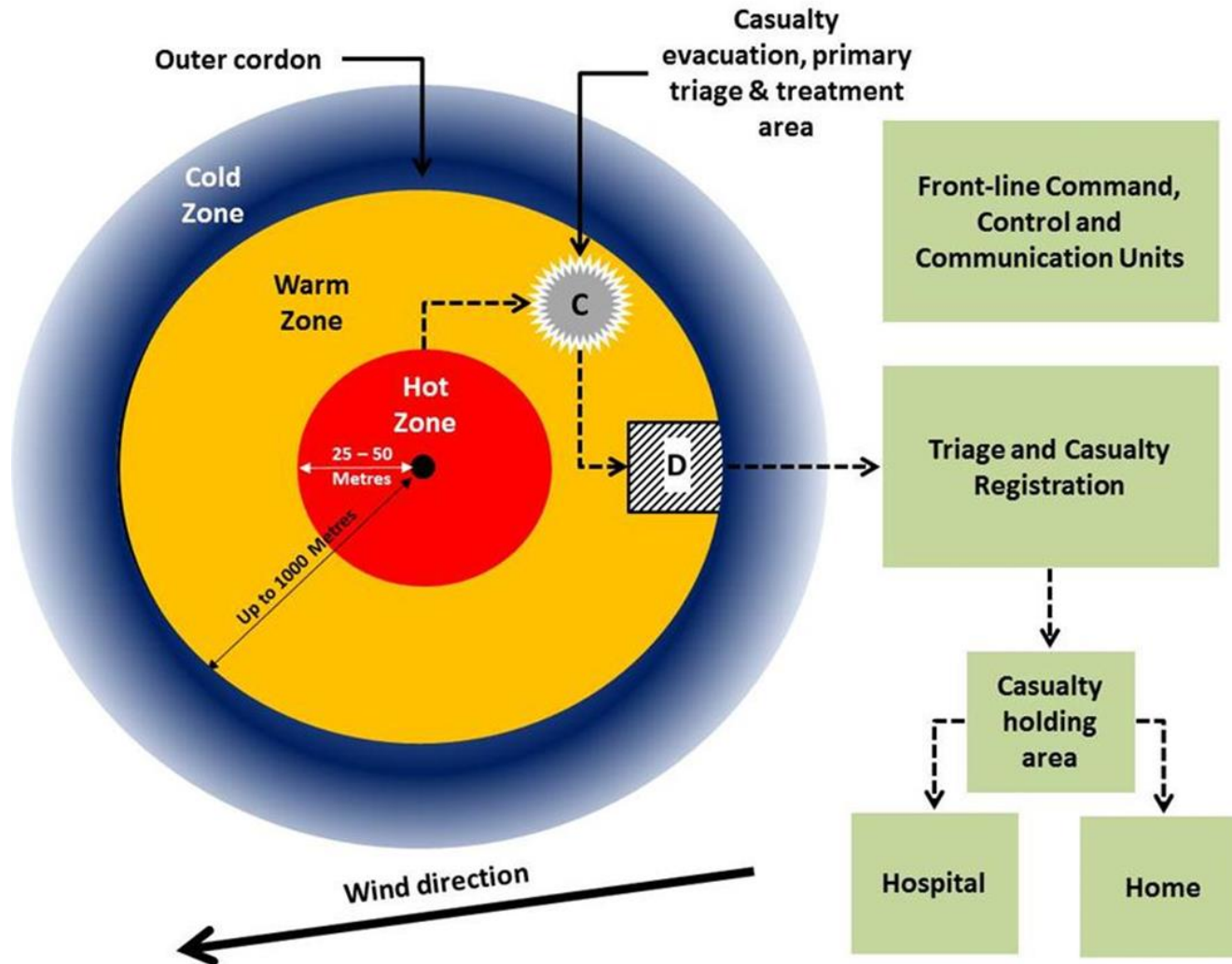
Warm Zone:
Decontamination area
Evacuation



Cold zone:
Command and control.
Public staging area

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Zoning



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Mass Decontamination

- To remove the hazardous substance and thus limit casualty exposure
- To prevent secondary contamination of responders and public



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Should be performed:

- By **skilled responders** with appropriate personal protective equipment (PPE)
- In the **warm zone, upwind** of the incident
- Following removal of contaminated clothing from casualty - at the head working towards the toes
- Using absorbent cloths and / or warm water (**Rinse-wipe-rinse**)
- **Determined on a chemical and incident (resource) specific basis.**

Case Study – Graniteville

January 2005 - rail accident in South Carolina - tank cars of pressurised liquid chlorine ruptured.

The chemical rapidly vaporised on exposure to the atmosphere.

Chlorine - Hazards

Pale-green gas with characteristic odour - bleach.

Heavier than air so will keep low to the ground

Exposure to high concentrations may be fatal.

Minor exposures may result in burning sensation of the eyes and throat.

Moderate exposure may cause breathing difficulties.

Longer term may cause lung damage.

Powerful oxidising agent.



Graniteville – Immediate Actions

Approximately 15 minutes - 300m exclusion “hot-zone” defined (Standard ERG Guidance).

Marshalling of firefighting personnel and equipment at a staging area **upwind** of the release site.

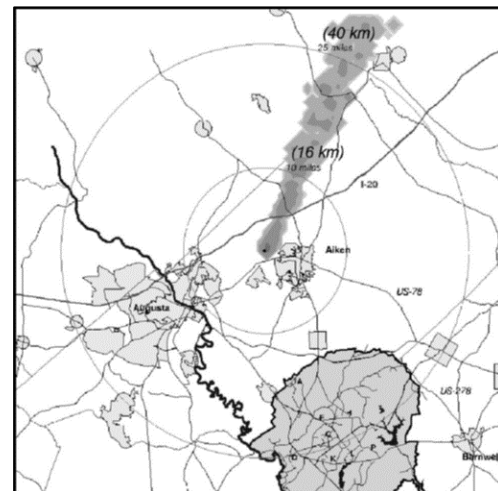
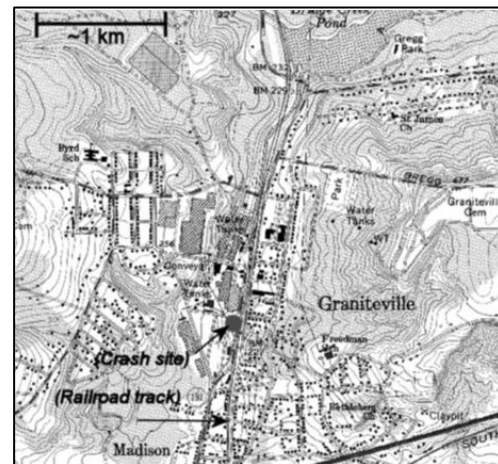
Within 50 minutes - decontamination stations organized upwind and at boundary of hot zone.

After 1 hour firefighter entry teams, wearing personal protective equipment entered the “Hot Zone”.

Triaged and casualties removed to one of the decontamination stations.

Nine people died, 72 were hospitalized, 525 were examined as outpatients.

5,400 residents within a mile of the crash site were forced to evacuate their homes.



Wider Population Protection - Sheltering

Often the default advice where there is risk of wider impacts (e.g. smoke or vapours):

- **Go-in, Turn-on, Tune-in** (to media sources)
- Keep doors and windows closed
- Close blinds and curtains if risk of explosion
- Turn off air condition / ventilation
- If necessary seal doors and windows with damp towels
- Use showers to knock-out gases if appropriate
- **Ventilate properties when danger has passed**



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Sheltering - Considerations

Sheltering will be helpful when the wind direction is changeable or buoyant but will not protect indefinitely

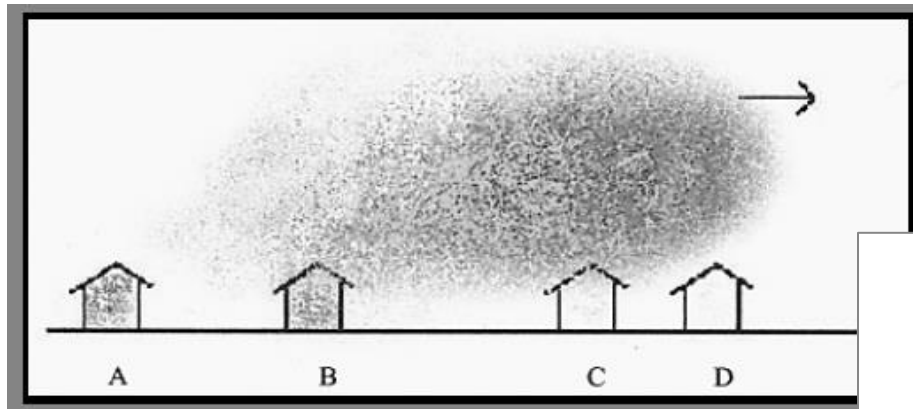
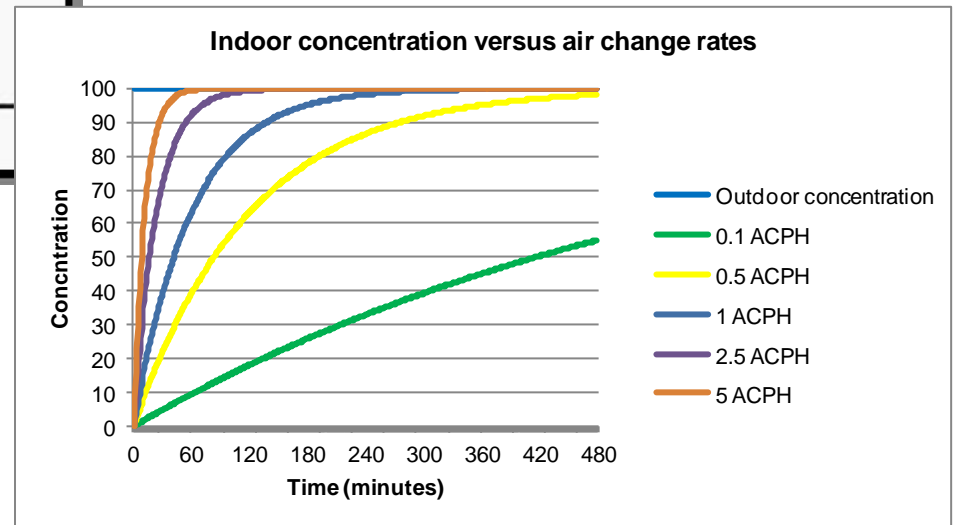


Figure. The movement of a plume at a given moment in time



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Wider Population Protection - Evacuation

Where sheltering cannot afford adequate protection.

Requires people to leave their homes / workplaces

Often used for non-residential situations e.g. workplace, outdoor scenarios.

Process needs to

- Be co-ordinated with multiagency input
- Be mindful of **susceptible individuals** e.g. young, elderly and infirm.
- Have transport and reception facilities available



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Evacuation - Considerations

- May be logistically difficult
 - Time of day
 - Panic / Grid-locking
 - Reluctance
- May increase exposure
- Therefore, normal advice to shelter.
- Exceptions:
 - Risk of fire/explosion
 - Build up of dangerous levels
 - Prolonged events



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Case Study – Tyre Fire Wales - Wider Protection

June 2011 - fire at an unoccupied warehouse on an industrial estate in South Wales.

Source material comprised 5,000 tonnes of tyre 'flock'

The fire continued to burn over the three-week period producing dense smoke.

Very quickly - Major incident declared.

A strategic coordination group (SCG) led by the local authority was established to provide risk assessment and incident management / Advice.

Key strategic decisions needed around risks to the public and the need for shelter and / or evacuation.

Real-time ambient air quality monitoring was implemented to assist in decision making .



https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/203631/CHaP_Report_21.pdf

Should you stay or should you go?

Default public health advice - Shelter

Informed primarily by air monitoring.

But also

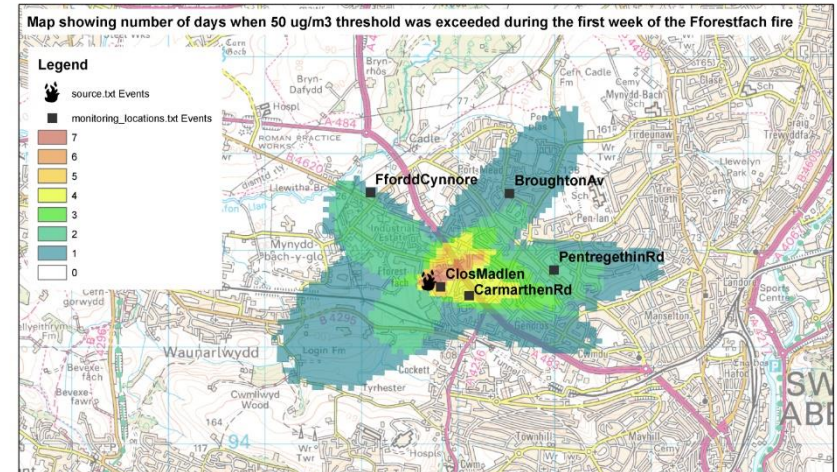
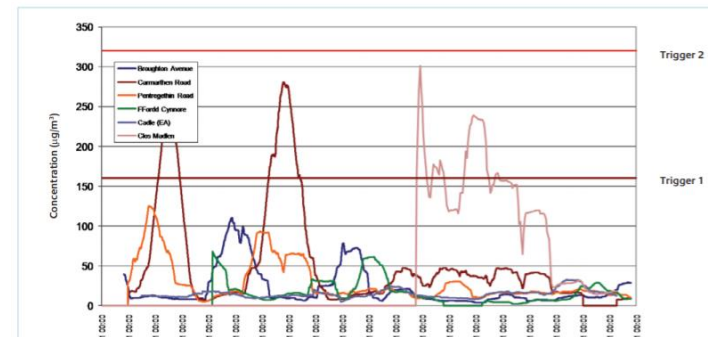
- fire fighting activities,
- meteorological forecasts,
- logistics.

Public Health Outcomes

Communities up to 2 km from the incident (estimated population 24,812) potentially exposed.

98 health concerns reported during incident

Reports consistent with smoke exposure: coughs, sore throats, eye irritation, headaches and nausea.



Ozone

Nitrogen Dioxide

Sulphur Dioxide

PM2.5 Particles

PM10 Particles

Nitrogen Dioxide

Based on the hourly mean concentration.

Index	1	2	3	4	5	6	7	8	9	10
Band	Low	Low	Low	Moderate	Moderate	Moderate	High	High	High	Very High
µg/m³	0-67	68-134	135-200	201-267	268-334	335-400	401-467	468-534	535-600	601 or more

<https://uk-air.defra.gov.uk/air-pollution/daqi>

Recommended Actions and Health Advice

Air Pollution Banding	Value	Accompanying health messages for at-risk individuals*	Accompanying health messages for the general population
<u>Low</u>	<u>1-3</u>	Enjoy your usual outdoor activities.	Enjoy your usual outdoor activities.
<u>Moderate</u>	<u>4-6</u>	Adults and children with lung problems, and adults with heart problems, who experience symptoms , should consider reducing strenuous physical activity, particularly outdoors.	Enjoy your usual outdoor activities.
<u>High</u>	<u>7-9</u>	Adults and children with lung problems, and adults with heart problems, should reduce strenuous physical exertion, particularly outdoors, and particularly if they experience symptoms. People with asthma may find they need to use their reliever inhaler more often. Older people should also reduce physical exertion.	Anyone experiencing discomfort such as sore eyes, cough or sore throat should consider reducing activity, particularly outdoors.

Banding is based upon specific chemical concentrations and exposure duration

<https://uk-air.defra.gov.uk/air-pollution/daqi>



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Getting Advice to the Public - Risk Communication

Clear mechanisms for effective and early communication. Forms an essential component of emergency planning, preparedness and response.

Risk communication

Developed at the planning stage.

Predetermined materials regarding hazards and response.

Should be done in liaison with all stakeholders including local communities, businesses and action groups.

Crisis communication

During an incident

Involving essential advice such as sheltering, evacuation, all-clear messages etc. via various media



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Messages - Warning and Informing

What do you want the public to do?

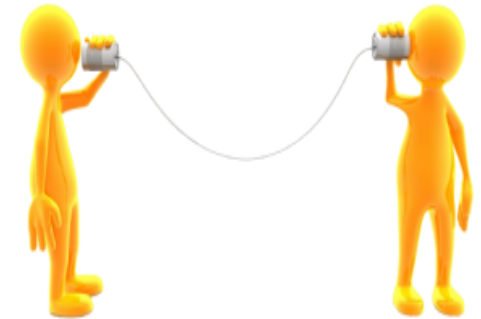
- Incident details:
 - what has occurred
 - who is in charge
 - actions being taken
 - who is at risk (from what, how)
 - where to get further information
 - where to get treatment / support

Single source for communications
usually the lead agency.

All forms of media

**Simple,
Timely,
Accurate,
Relevant,
Credible,
Consistent**

WHO Guidelines



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The Role of Social Media

- Now an Essential means to monitor and disseminate messages

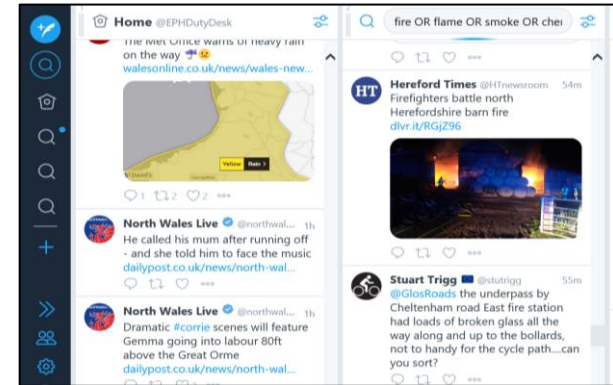
Free

Tweet deck provides “live” searches of key terms within defined geographical locations

Commercial Products

Many available

- Search multiple platforms.
- Real-time display to multiple users
- Comprehensive data analytics
- Alerts when detecting increased traffic



<https://tweetdeck.twitter.com/>



<https://www.brandwatch.com/>



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Also can obtain useful information from social media

Images and videos

Conditions “on the ground”

Timestamps, Geolocation

Responses / Emotions



● Negative ● Neutral ● Positive



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Case Study – Essex Beach Incident

Busy beach during August bank holiday.

Beachgoers reported breathing difficulties following swimming / contact with sea water.

Police, ambulance and fire service attended.
Public warned to stay out of the sea.

PHE further advice via local authority / NHS 111-
shower and drink fresh water.

Multiple persons attended local hospital.

All affected persons recovered overnight.

Cause unknown – MCA - no evidence of spillage
from vessels. Possibly marine algae –
unconfirmed.



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Impact of PH messages – Essex Beach Incident – Day 1

Police scramble to Essex beach as people left 'struggling to breathe' [standard.co.uk/news/uk/frinton...](https://www.standard.co.uk/news/uk/frinton...)



Police scramble to Essex beach as people left 'struggling to b...
Emergency services have scrambled to a seafront in Essex after receiving several reports of beachgoers coughing and struggling to breathe' [standard.co.uk](https://www.standard.co.uk)

♡ 1 6:05 PM - Aug 25, 2019



Tendring Council ✓
@Tendring_DC



For the latest on the incident affecting Frinton & Walton, please see here: [essex.police.uk/news/news-and-...](https://www.essex.police.uk/news/news-and-...)
Advice from @EastEnglandAmb is: - Wash/change after leaving sea

- Drink fresh water

- Call 111 if still concerned.

Patients have found symptoms improved after leaving the water.

♡ 2 7:50 PM - Aug 25, 2019

👤 See Tendring Council's other Tweets

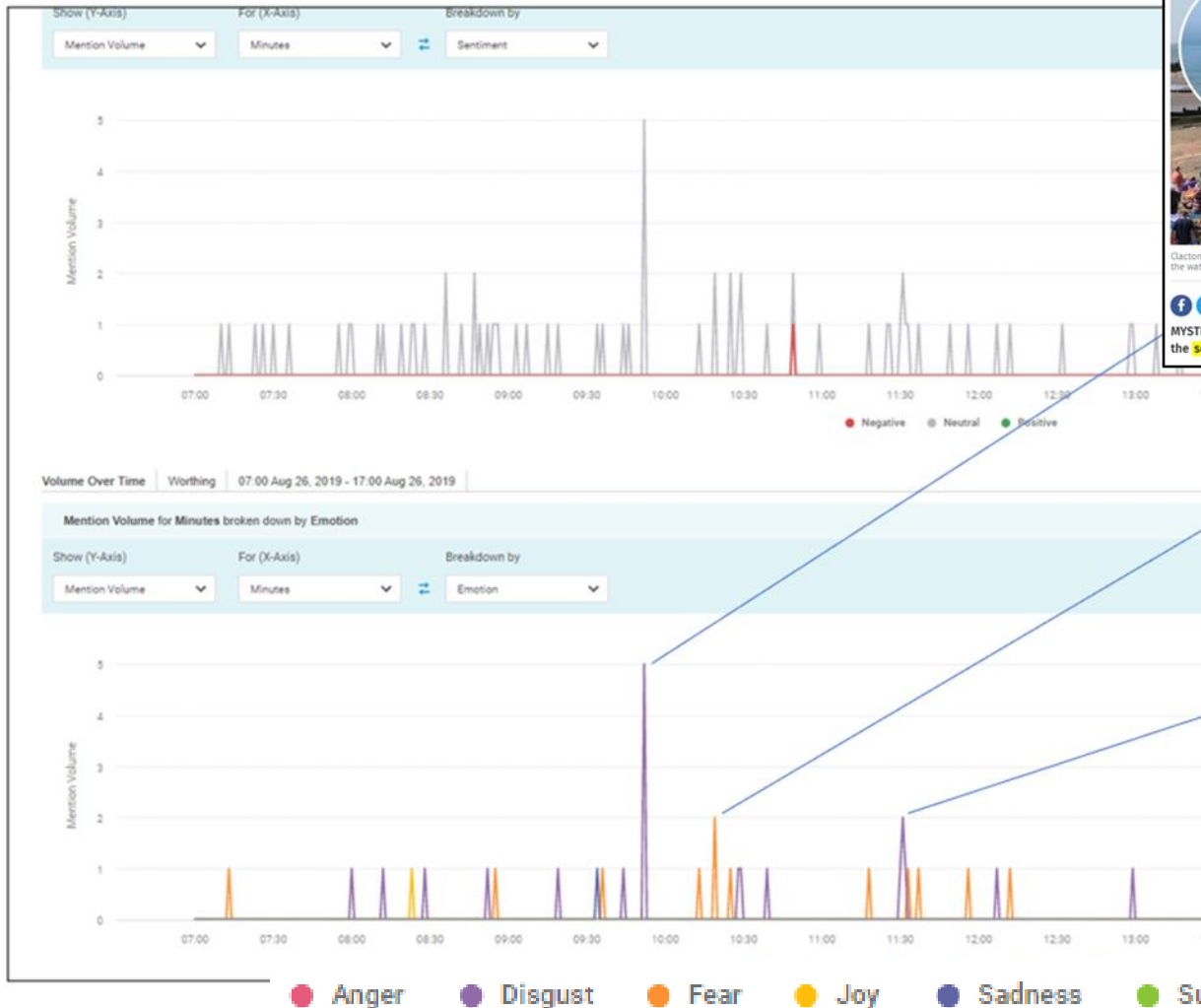


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Essex Beach Incident – Day 2



News

Everything we know after children fell ill after swimming in sea off north Essex coast



Most read Commented

When is someone going to investigate this? Two weeks ago Worthing beach was evacuated for same reason. Previously Beachy Head. SOMETHING is going on. Joint the dots. What is happening? Frinton-on-Sea: Police called as beachgoers left 'struggling to breathe' [bbc.co.uk/news/uk-england...](https://www.bbc.co.uk/news/uk-england...)

Clacton
the water
f
t
MYSTER
the sea



Beachgoers left 'struggling to breathe'
Emergency services were called after people at a beach in Essex reported having difficulty breathing. [bbc.co.uk](https://www.bbc.co.uk)

News

Tourists reassured the south Essex sea is safe after concerns raised along coast

By Matthew Critchell



Safe - Southern Essex

f t in 7 comments

Tourists and sunseekers have been reassured the sea around south Essex is safe after concerns were raised along the Essex coast.

Get involved with



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Ongoing Response

As the incident continues, focus will shift from the impacts on scene to the wider implications of exposure. It requires knowledge of

- Pollutant behaviour in environment
 - Proximity of communities and ecosystems
 - Meteorological forecasts
 - Modelling forecasts
 - Monitoring and sampling
- Provides a basis for continuously assessing and reviewing the risk to the public and the wider environment.



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Recovery

Longer term actions following the incident

- Victim support and follow-up – Physical and psychological treatment, aid for welfare, employment etc.
- Remediation – Clean up of contamination
- Restoration – Returning the environment to its original state
- Rehabilitation – Adapting ways to get things back to normal
- Investigation and applying lessons learnt



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Further Useful Information / Materials

Manual for Public Health management of Chemical Incidents (WHO 2009)

https://www.who.int/environmental_health_emergencies/en/

Arcopol Project – response tools / Risk Communications

<http://www.arcopol.eu/?/=lang/en>

Arcopol E-learning – Shoreline Response (guest log in)

<http://www.cardiffmet.ac.uk/health/ITC/Pages/Public-Health-Management-for-Incidents-and-Events.aspx>

Emergency Response Guidebook 2016 (US Dept of Transport)

<https://www.phmsa.dot.gov/hazmat/erg/emergency-response-guidebook-erg>

Hazrunoff (Social Media study) <http://www.hazrunoff.eu/tools-for-situation-awareness-emergency-response/>

Uk Recovery Handbook for chemical incidents (UK HPA 2013)

<https://www.gov.uk/government/publications/uk-recovery-handbook-for-chemical-incidents-and-associated-publications>

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Questions?



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