



Mapping World Events

Clive Best , JRC

GI4DM, 2005

Basic Goals

- Fusion of media reports & Geospatial data for situation and crisis management.
- Early warning systems & Trend analysis
- Based on :
 - Automatic Internet news monitoring (EMM)
- Users: RELEX, ECHO, EC Crisis Rooms

“State of the World”

Physical

- Thermodynamic systems have a state $S(T, V, P..)$. Hide molecular complexity.
- Measured by Temp, Press, Entropy...
- Weather is rather more complex – chaotic
- Weather Maps

Social

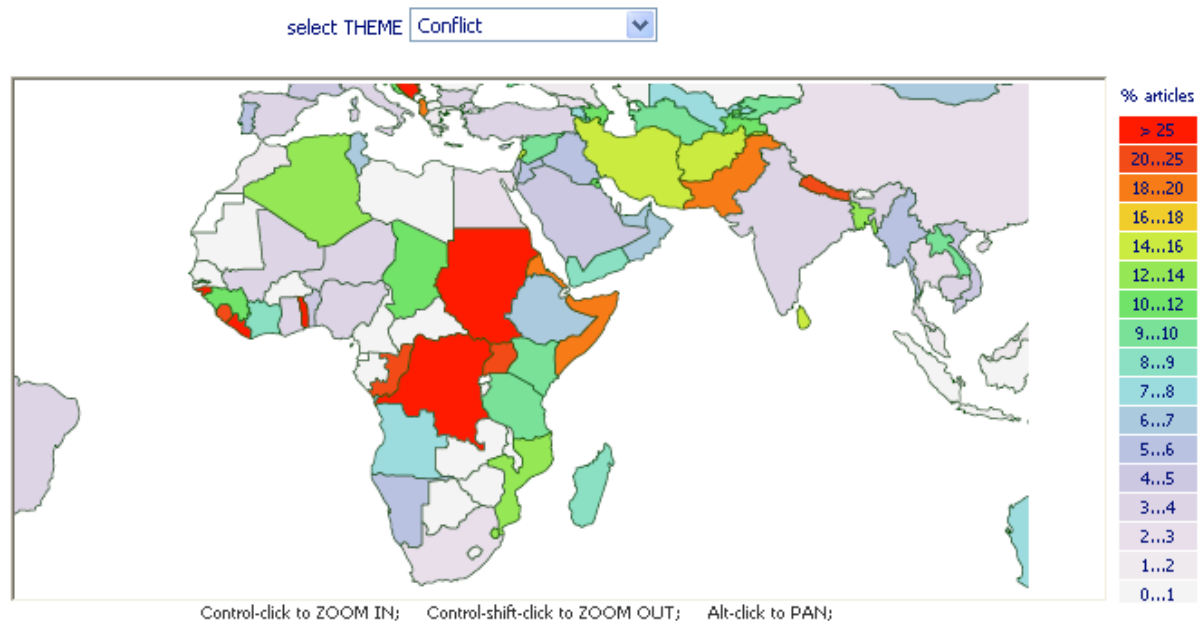
- Social systems have a “state” (war, peace, growth, famine etc.) Hide complex issues.
- Measured by news reporting - indicators
- Real life is also complex even chaotic
- News Maps

Analogy with the weather



← Weather

NEWS →





Europe Media Monitor (EMM)

- Media Monitoring System for European Union
- 700 web sites around the world every 15 mins
- 15 news agencies
- 30 world languages
- Site updates every 10 minutes
- 25,000 articles per day
- 400 subject Alerts defined by keyword lists
- EC specific but has good world coverage

EMM Alert Definitions

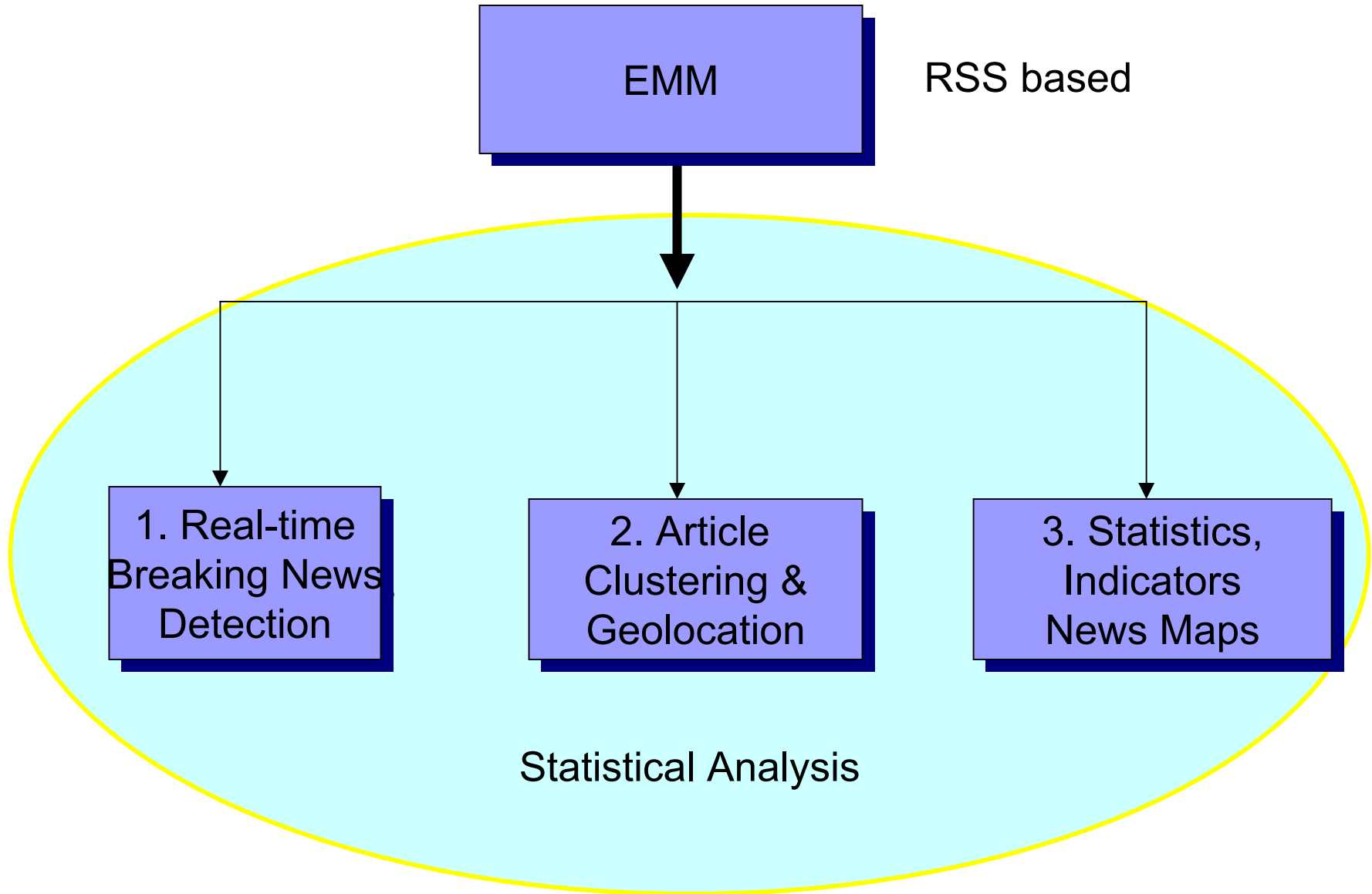
```
<alert id="AlternativeEnergy">
  <maxArticles>50</maxArticles>
  <contact>paolo.catalani@cec.eu.int</contact>
  <definition>
    <mustContain>
      <combination>
        <or>
          <pattern>energy</pattern>
          <pattern>énergie</pattern>
          <pattern>energia</pattern>
          <pattern>energie</pattern>
        </or>
        <or>
          <pattern>sustainable</pattern>
          <pattern>soutenable</pattern>
          <pattern>sostenibile</pattern>
          <pattern>stützbar</pattern>
          <pattern>safe</pattern>
          <pattern>sûr</pattern>
          <pattern>sicura</pattern>
          <pattern>sicher</pattern>
          <pattern>clean</pattern>
          <pattern>propre</pattern>
          <pattern>pulita</pattern>
          <pattern>sauber</pattern>
          <pattern>biomass%</pattern>
          <pattern>alternative+fuels</pattern>
          <pattern>carburant+alternatif</pattern>
          <pattern>carburante+alternativo</pattern>
          <pattern>alternative+kraftstoff</pattern>
          <pattern>fuel+cells</pattern>
          <pattern>kraftstoff+zelle</pattern>
        </or>
      </combination>
    </mustContain>
  </definition>
</alert>
```

Tunable subject
Alert definitions
detect articles &
Send SMS/email
alerts

Boolean
Combinations

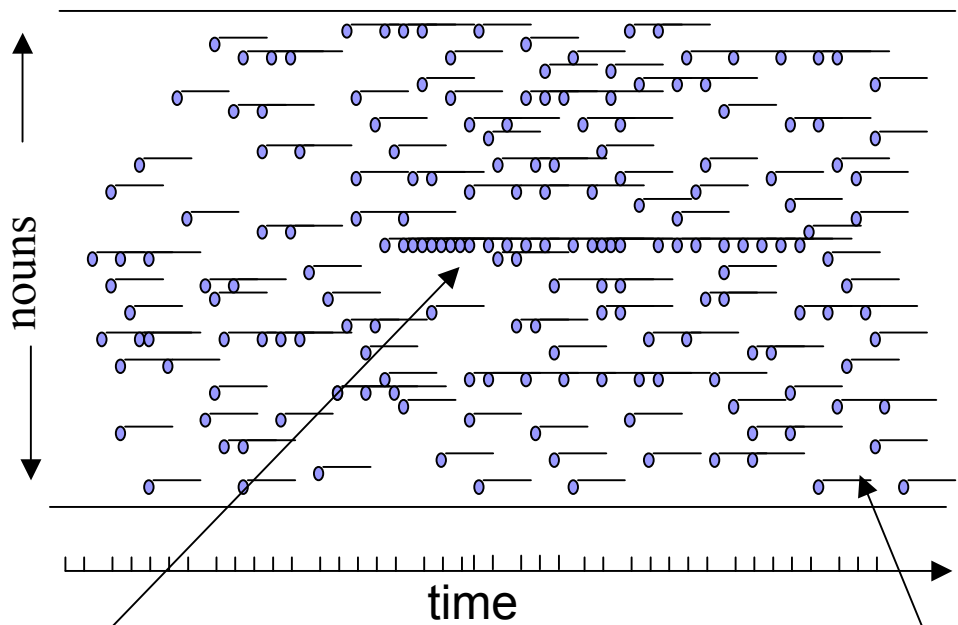
```
<alert id="NuclearSafety">
  <maxArticles>50</maxArticles>
  <contact>paolo.catalani@cec.eu.int</contact>
  <definition>
    <words threshold="10">
      <word>
        <pattern>nuclear+safety</pattern>
        <weight>10</weight>
      </word>
      <word>
        <pattern>sécurité+nucléaire</pattern>
        <weight>10</weight>
      </word>
      <word>
        <pattern>sicurezza+nucleare</pattern>
        <weight>10</weight>
      </word>
      <word>
        <pattern>kern-sicherheit</pattern>
        <weight>10</weight>
      </word>
      <word>
        <pattern>progetto+nuovo+reattore</pattern>
        <weight>10</weight>
      </word>
      <word>
        <pattern>neu+reaktor+entwerfen</pattern>
        <weight>10</weight>
      </word>
      <word>
        <pattern>TACIS</pattern>
        <weight>10</weight>
      </word>
    </words>
  </definition>
</alert>
```

Word Filters: $\sum \text{weight} > \text{threshold}$



1. Real Time Breaking News Detection

- Headlines appear with capitalised Nouns.
- Identify new Topics appearing above the background



Breaking News topic

Time to live

Signal level depends on $\frac{dn}{dt}$

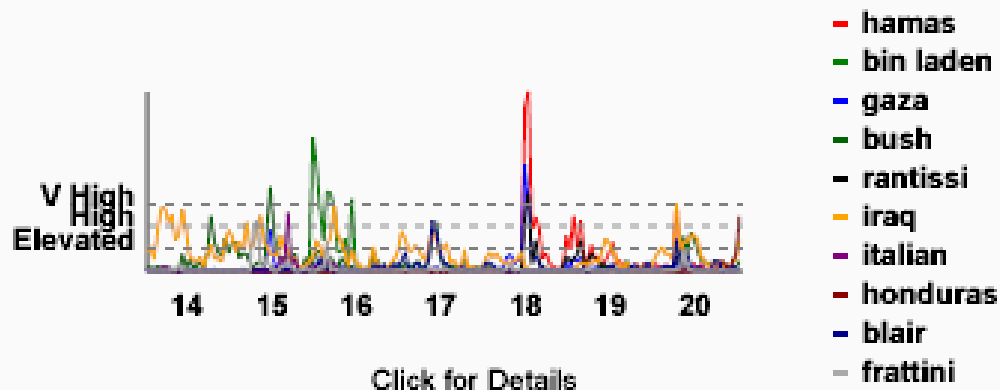
April 20 2004

Breaking News

Last 6 Hours

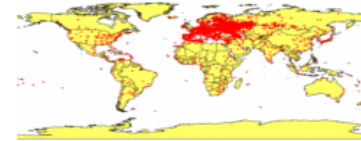
Last 48 Hours

Last Week



Assign keywords, geocoding

- Extract semantic features from plain text
- Compare frequency of word in one article to its frequency in a “big” corpus
- Geocoding (geographical place recognition), using a multi lingual database of about 80,000 places in the world. Disambiguation needed (14 Paris’)



More Than 20 Dead In Bali

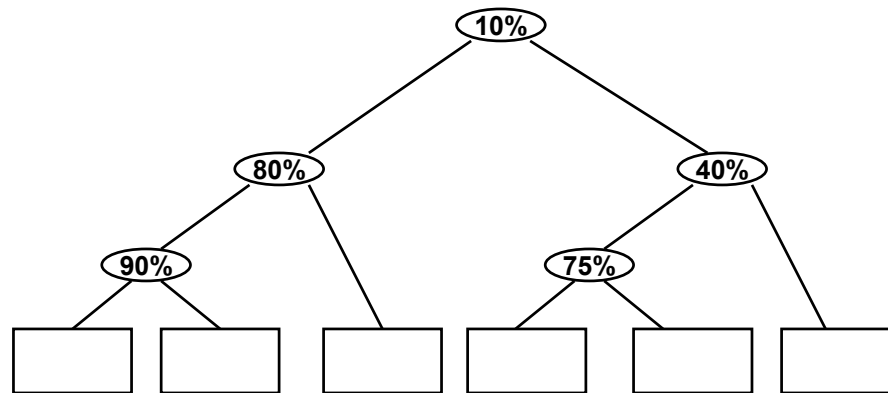
Blast site (Reuters) More Than 20 Dead In Bali More than 20 people have been killed and up to 120 others wounded in a series of explosions on Indonesia's resort island of Bali. There were three blasts at two nightclubs, one of which was caused by a homemade bomb, police officials said. One officer said they had occurred simultaneously, one of them not far from the US consulate on Bali. 'Lightly wounded' "At this stage we have 14 people dead. There are around 120 badly and lightly wounded," Yatim Suyatmo, police spokesman for Bali, said. One local photographer said he had seen up to 15 cars wrecked by one of the blasts, with a number of people still inside the club. Police said it was too early to say if all the blasts had been caused by bombs. But they come at a time of growing security concerns in the world's most populous Muslim nation in the wake of recent terror threats. Explosions Police said all the explosions were concentrated in the Kuta Beach district - an area popular with foreign tourists. An official at a local hospital said the wounded included Americans and Australians. Eyewitnesses spoke of chaos near one of the blasts at the Sari nightclub near the famous Kuta beach strip. One witness said windows on shops had been blown out up to 500 metres away from the Sari nightclub, and that the blast had been heard many miles away

blasts, bali, wounded, explosions, sari, lightly, kuta, nightclub

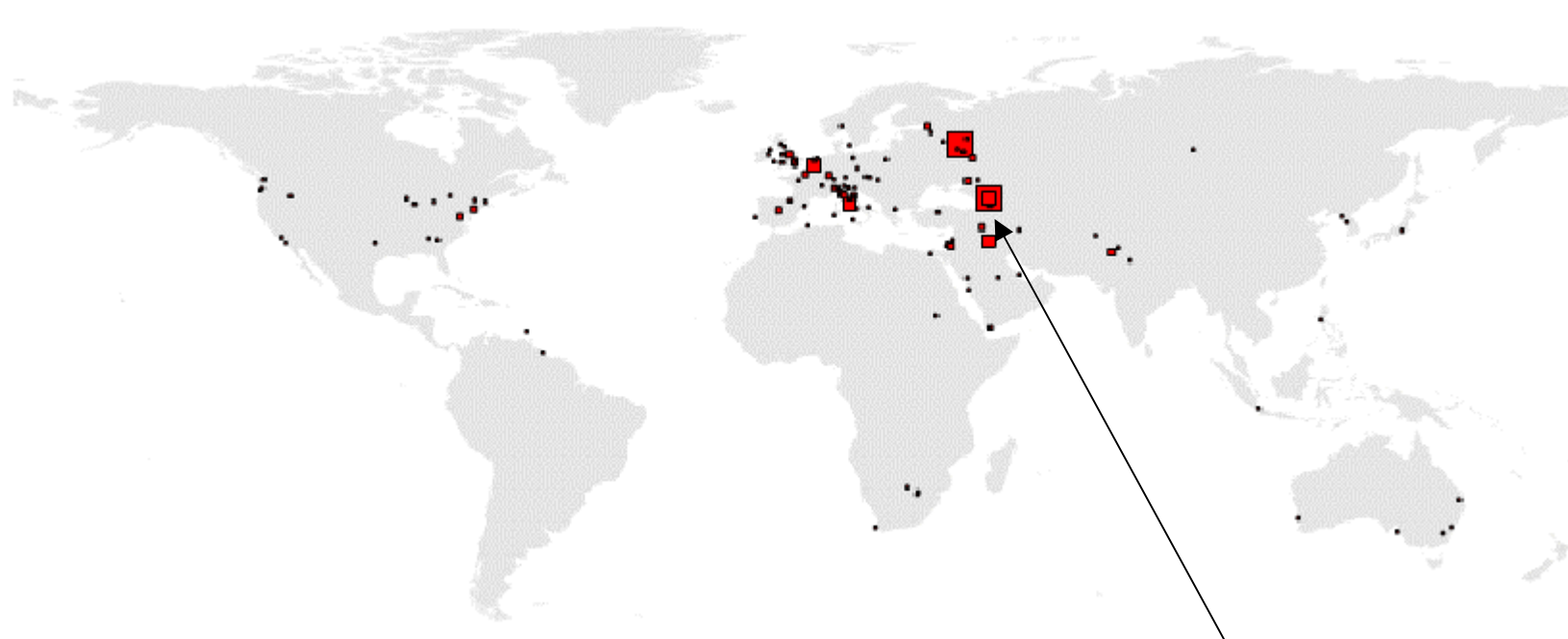
id		<ul style="list-style-type: none">• bali (5)• indonesia (1)
uk		<ul style="list-style-type: none">• uk (1)

Building a cluster tree

- Every night, for each language
- Take all articles (7000 for English)
- Use keywords and countries as features
- Algorithm:
 - Find pair of texts that are most similar
 - Group them in one cluster, repeat the operation until only one cluster remains



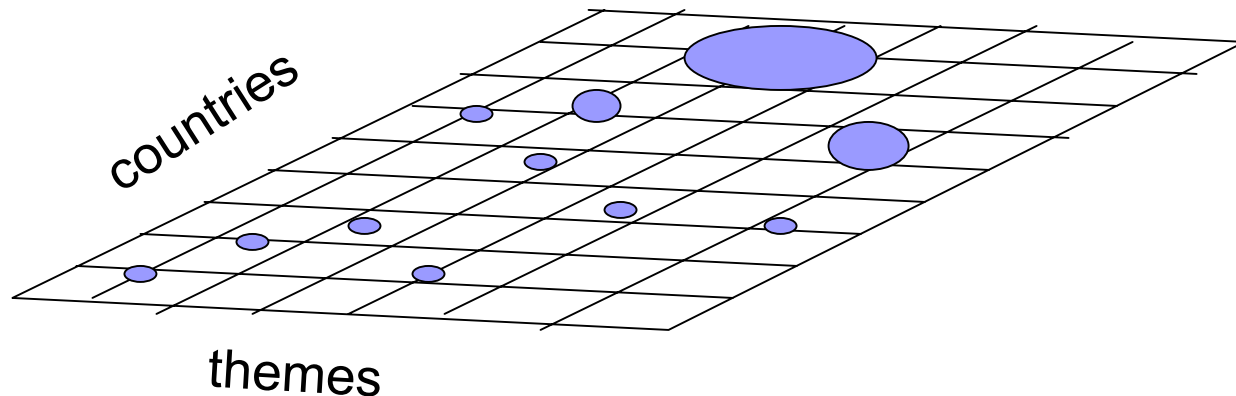
Geocoded news for 6th September 2004



Beslan

3. Statistics, Indicators News Maps

- Approach is to build into EMM operations logging of statistics, themes and countries.
- 24/7 live monitoring since July 2003



Themes

- Themes are defined as Alerts which apply Globally :
 - Conflict
 - Food Security and Food Aid
 - Terrorism
 - Humanitarian Aid
 - Security
 - Natural Disasters
 - Man Made Disasters
 - Ecology

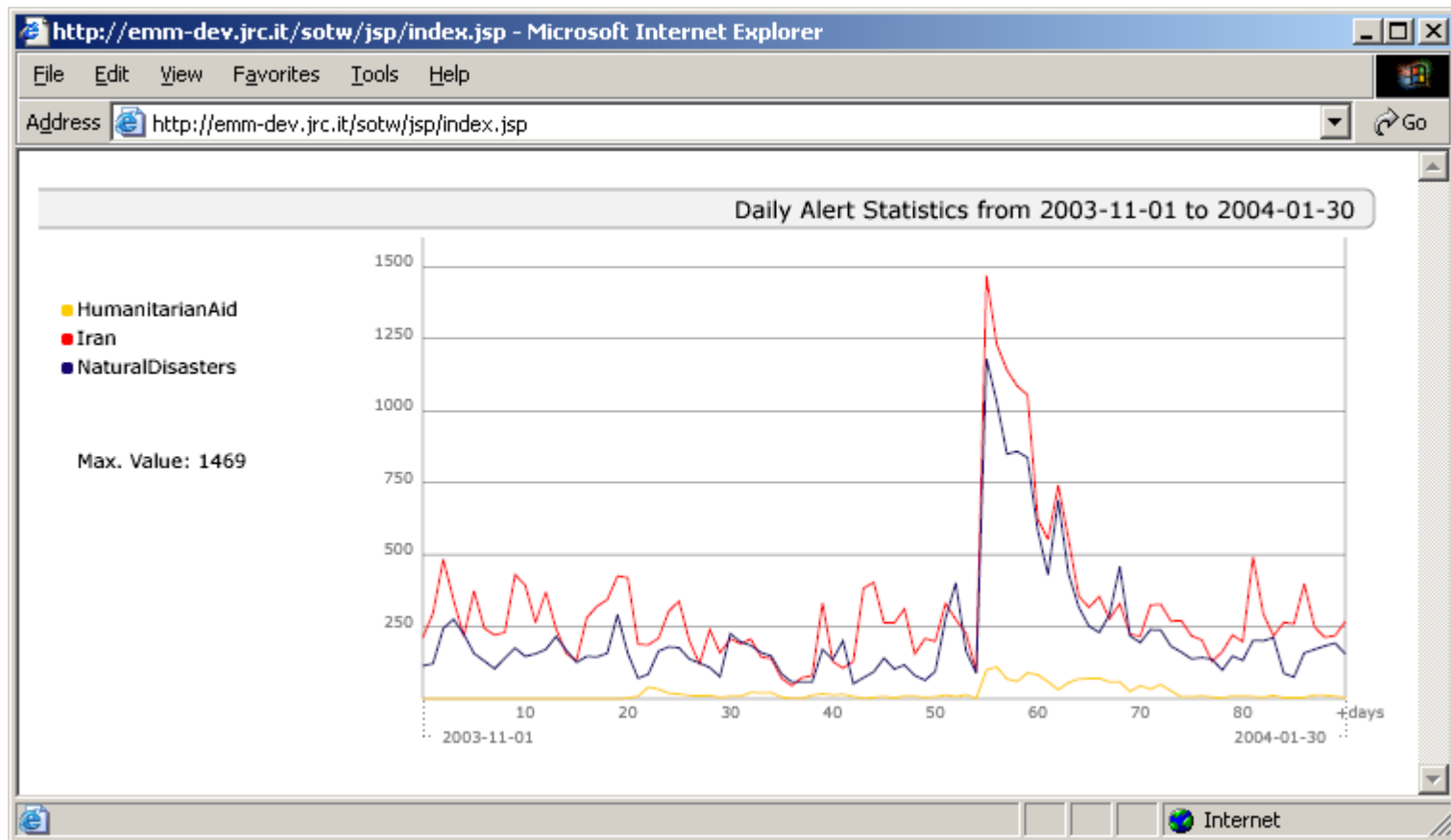
Countries

- Alert categories are defined for all world countries. Name of country in all languages + capitals (if unique).
- 220 countries

Trends and Statistics

- EMM Alert system logs statistics since July 2003.
- Alert System keeps hourly statistics in XML files for each alert AND for (theme,country) coincidences.
- Alert files also record all categories triggered for each article, source countries, languages etc.
- XML-API to select coincidences
- We then define sets of articles $S(\text{theme,country})$ for any hour/day/month

BAM Earthquake Detail



Thematic Indicators

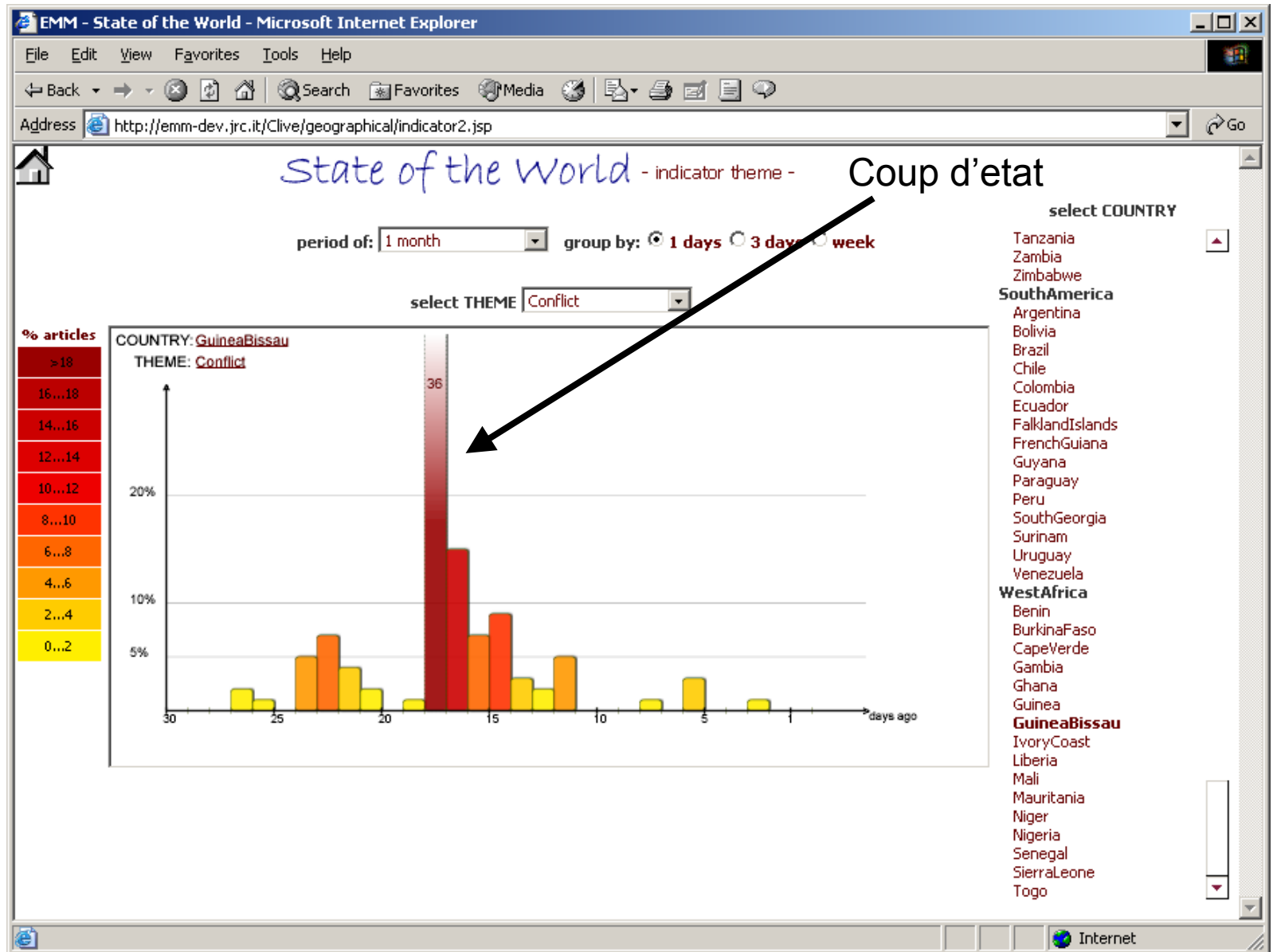
Thematic Indicators derived from EMM Alert Statistics

$$I_{cj} = \frac{N_{cj}}{N_c} \quad ; \text{ where } N_{cj} = \text{No. articles for Combination of country C and theme j} \\ \text{and } N_c = \text{total <count> for country C.}$$

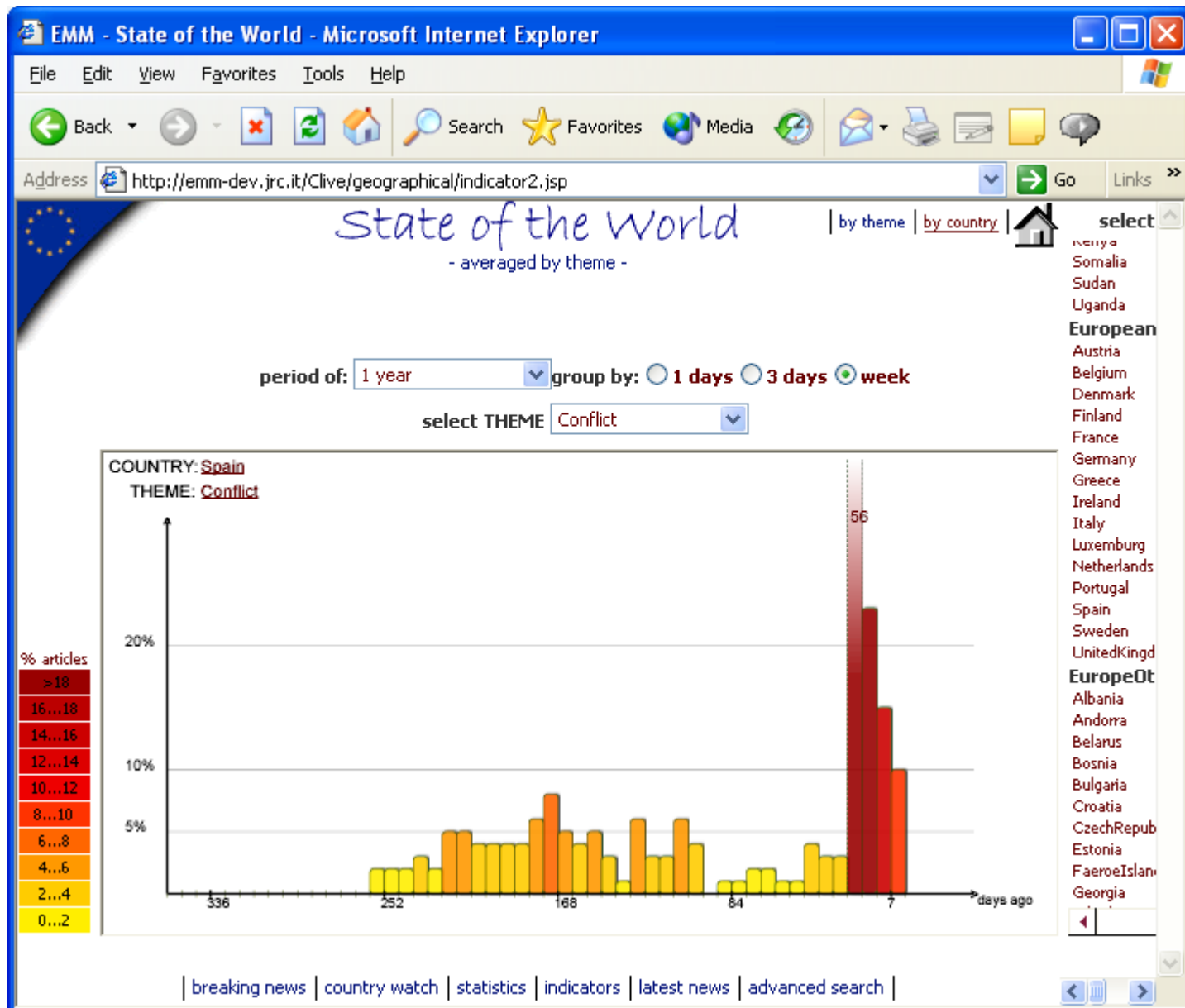
$$I_{jc} = \frac{N_{cj}}{N_j} \quad ; \text{ where } N_{cj} = \text{article <count> for Combination of country C and theme j} \\ \text{and } N_j = \text{total <count> for theme j}$$

$$I_{cj}(t, \Delta T) = \text{Indicator measured at time } t \text{ aggregated over time period } \Delta T$$

Time series studies of country indicators



Terrorist Attacks in Spain



News Maps

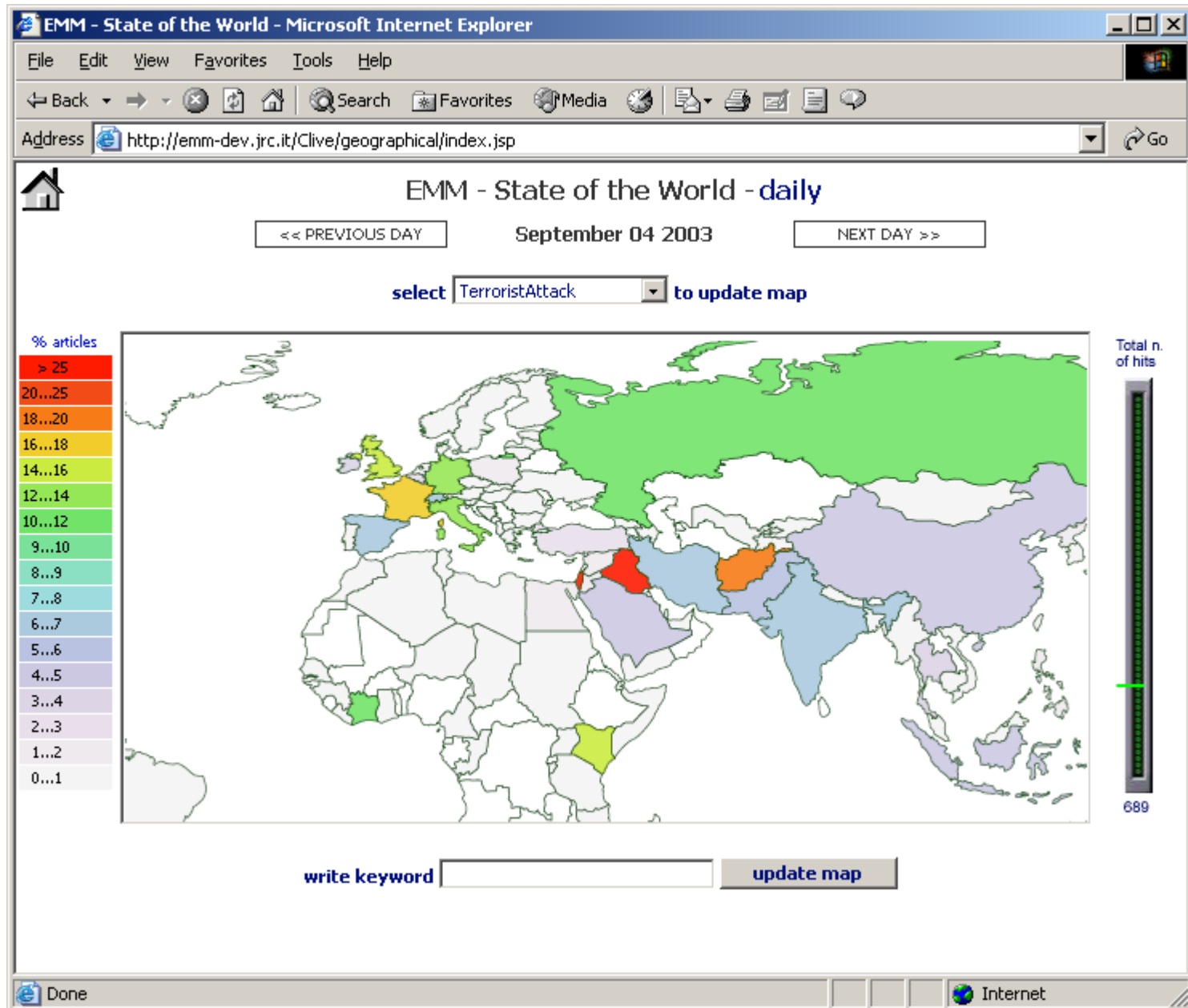
■ Basic Idea

- World Map of country indicators at one time
- Animations of events show evolution over time

■ Technology

- SVG – Scalable Vector Graphics & FLASH
- Simple XSLT transform
- Live 24/7 operations, Live News Maps

Geographic Indicators

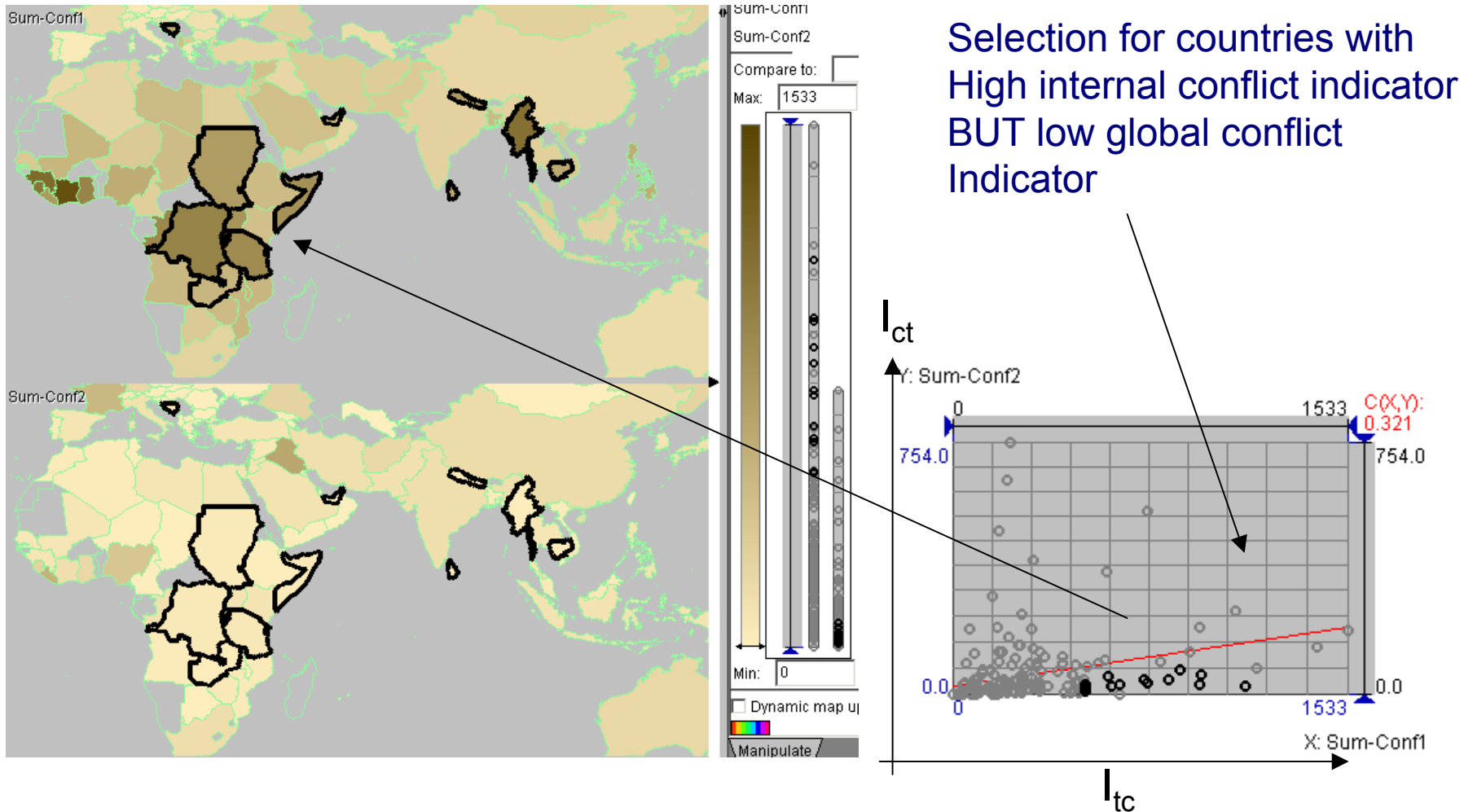




Case Study – Forgotten Crises

- While the world's attention focuses on crises in Iraq and Middle East, those in Africa and Asia are “forgotten”.
- ECHO, UN need to identify these forgotten conflicts to provide humanitarian aid to avert major tragedies like Rwanda.
- Forgotten crises are countries with high internal conflict but low media coverage.

Aug2003: Forgotten Crises – I_{Conflict}



Study: Information synthesis for RELEX

Provide desk officers with concise clear overviews of current situation in any country of the world. Integrate news, Maps & structural data

News hotspots for themes

select THEME



Control-click to ZOOM IN; Control-shift-click to ZOOM OUT; Alt-click to PAN;

State of the Word - Country Watch - Microsoft Internet Explorer

Address: http://sotw.jrc.it/country_watch?language=en&country=LR

Liberia (LR)

Click on the map for larger image

LAST 7 DAYS ARTICLES

Days (MM/DD)	Articles
11/13	28
11/14	28
11/15	20
11/16	12
11/17	12
11/18	18
11/19	18

LAST 12 MONTHS ARTICLES

Months (YY/MM)	Articles
03/01	0
03/02	0
03/03	0
03/04	0
03/05	0
03/06	0
03/07	2000
03/08	6000
03/09	6000
03/10	1000
03/11	1000

THEMATIC INDICATORS

30 days - Conflict

30 days - Development

30 days - NaturalDisasters

LATEST NEWS

La Chine décide d'envoyer des Casques bleus au Libéria afp 2003-11-19T16:55+0100
La Chine a décidé d'envoyer des Casques bleus au Libéria, un mois après avoir rétabli ses relations diplomatiques avec ce pays dévasté par presque quatorze ans de guerre civile quasiment ininterrompue,

U.N. will be watching to see if donors pledge US\$3 billion to forgotten emergencies ap 2003-11-19T09:55+0100
The United Nations will be watching closely to see if donor nations that pledged US\$13 billion dollars last month to rebuild Iraq come up with another US\$3 billion to help 45 million people caught up in

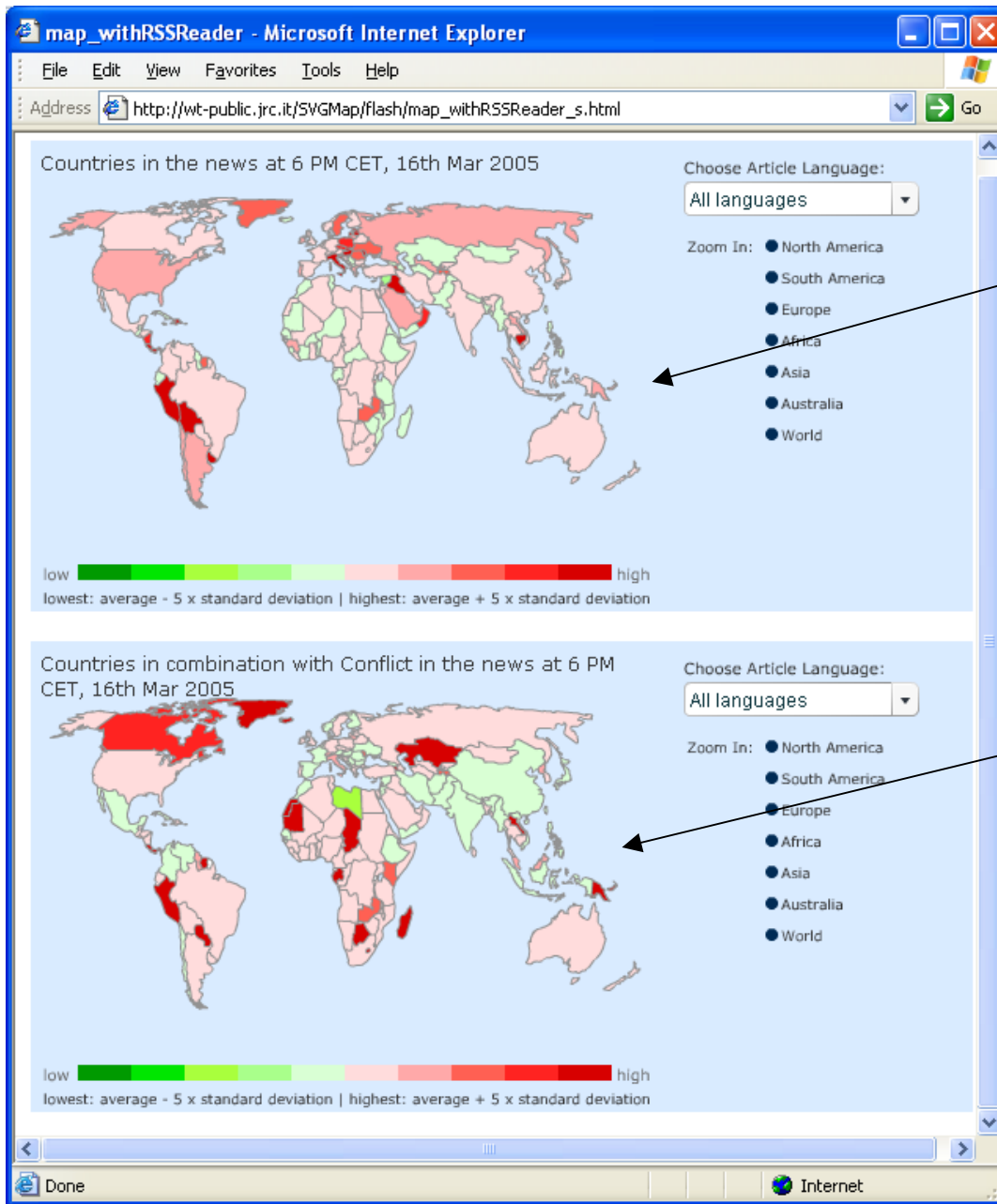
Liberia troop deployment delayed due to error examiner 2003-11-19T09:18+0100
The deployment of 120 Irish soldiers on a UN peace-enforcing mission in the African nation of Liberia was delayed last night due to an administrative setback. The soldiers were due to depart early this morning, but their aircraft did not have clearance to enter some countries' airspace.

«Nel mirino di Al Qaeda un ministro italiano» corriere-it 2003-11-19T06:27+0100
DAL NOSTRO INVIATO CARMAGNOLA (Torino) - «Il prossimo obiettivo dei fratelli sarà un politico italiano, molto probabilmente un ministro di questo governo che ha dichiarato guerra all'Islam. No, non conosco il suo nome. Se però che potrebbero beccarlo all'estero, durante un viaggio...». E' mezzogiorno di sabato scorso.

UN appeals for 'modest' \$3bn guardian 2003-11-19T04:13+0100
World: Afghanistan and Iraq deflect funds from 21 countries ruined by conflict and disaster.

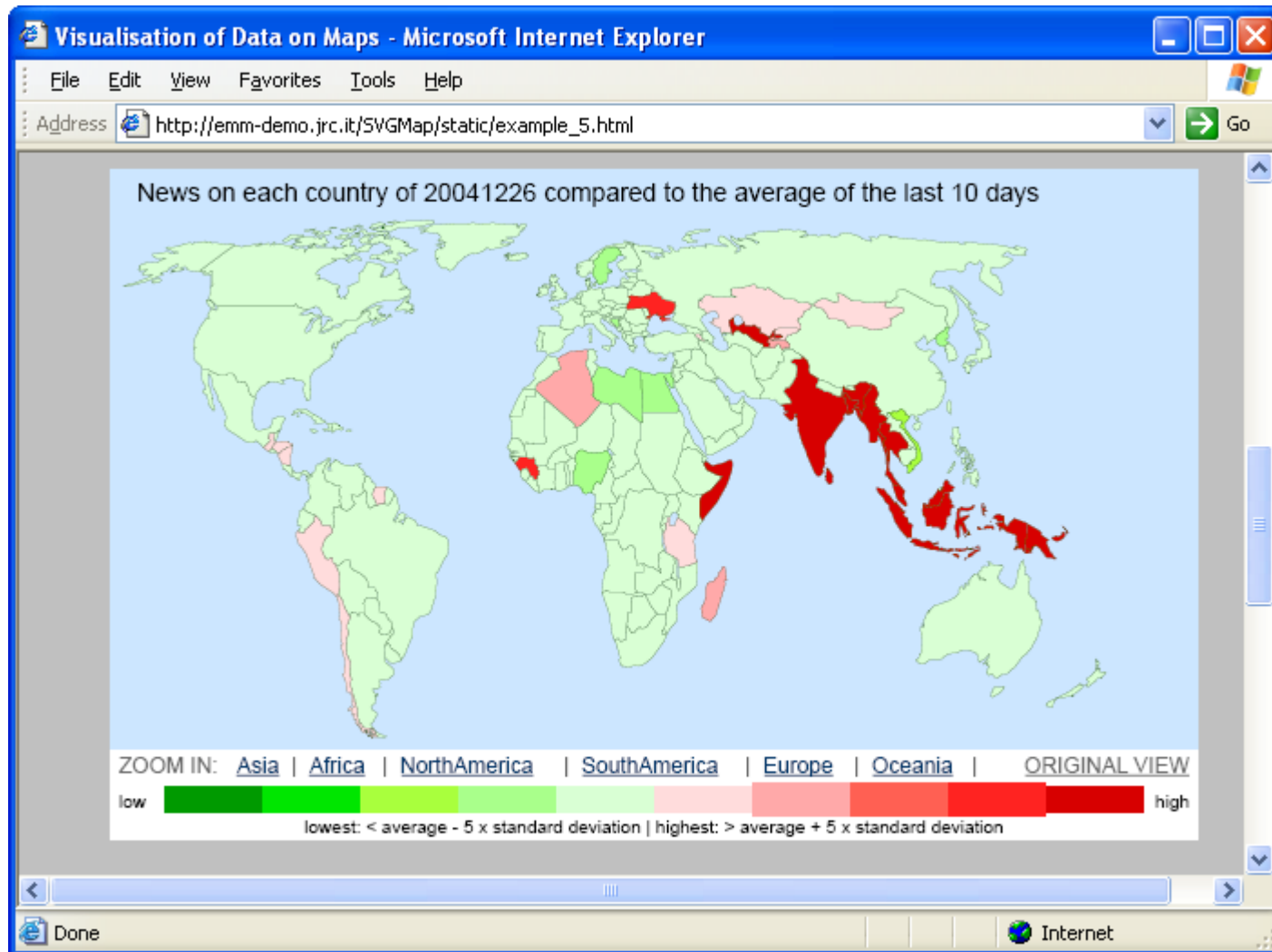
Search in past LR articles for: Go

Hourly Live News Maps

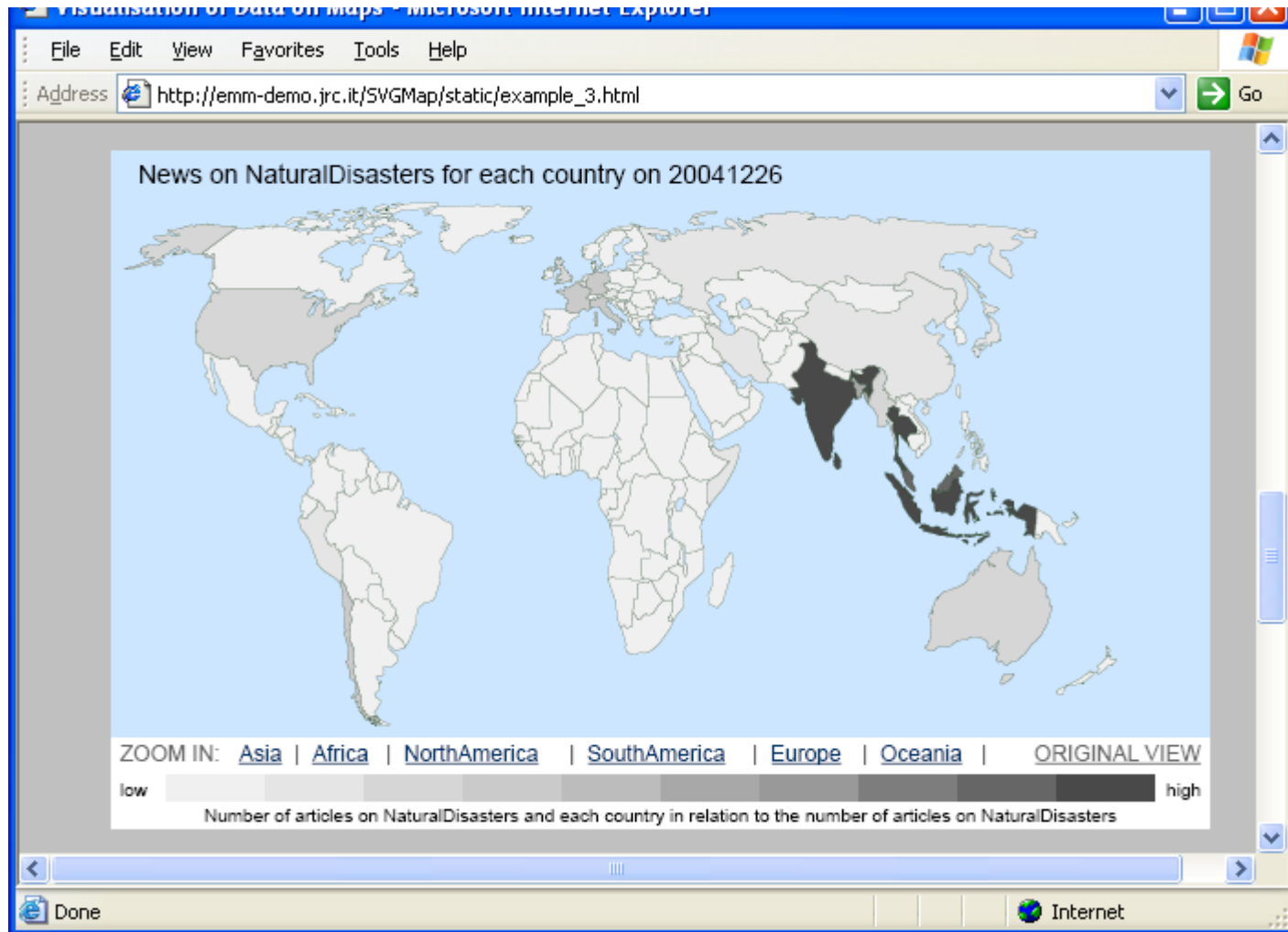


Countries more in the news
Compares to 5 Day average .

Countries more mentioned in
Conflict articles
than expected



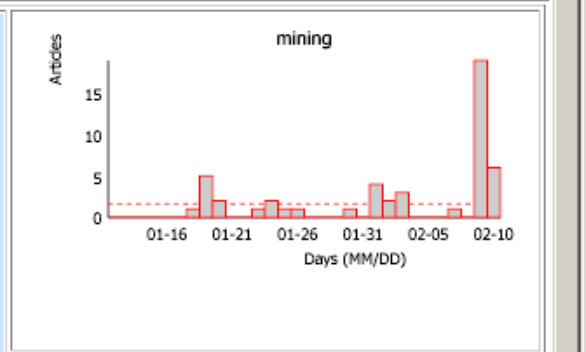
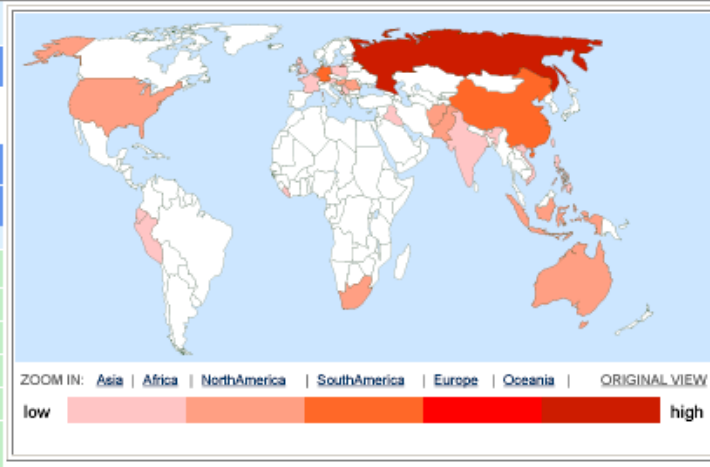
Effect of Tsunami 26th Dec 2004



Early Warning Monitor

LOGOUT editor Search

- [Maintain Categories]
- Natural Disasters
 - Manmade Disasters** [New]
 - Terrorism
 - Maritime Disasters
- | | | | |
|-------------------|-----|---|--------|
| mining | 49 | 6 | [Edit] |
| nuclear | 74 | 3 | [Edit] |
| air | 41 | 1 | [Edit] |
| chemical | 58 | 1 | [Edit] |
| train | 147 | 0 | [Edit] |
| building collapse | 8 | 0 | [Edit] |



Recent Alerts

E-Mail Alerts -

All **Wires** NewsPapers TV & Radio en

results 1 to 20 of 49 (Page 1 of 3)

ORDER: by date ↑ | by feed | by title

49 Articles for 'mining'

Thu, Feb 10, 05

- First funerals of Kemerovo mine blast victims set for Feb 11** 08:12 CET **interfax-en**, Translate : nl fr de el it pt es
 KEMEROVO. Feb 10 (Interfax) - The first funerals of those killed by the February 9 methane blast in the Yesaulskaya coal mine in the Kemerovo region will be conducted on Friday, February 11.
- Siberia Coal Mine Blast Kills 22 People** 04:52 CET **guardian**, Translate : nl fr de el it pt es
 Siberia Coal Mine Blast Kills 22 People Thursday February 10, 2005 3:46 AM By MIKE ECKEL Associated Press Writer MOSCOW (AP) - An explosion ripped through a mine in a coal-rich region of Siberia on Wednesday, killing at least 22 workers and three missing
- Mine explosion kills 22 in industry plagued by safety violations** 03:23 CET **glasgowherald**, Translate : nl fr de el it pt es
 An explosion swept through a mine in the Kuzbass region of Siberia yesterday, killing at least 22 workers and leaving four missing in the latest accident in an industry plagued by dilapidated mines, ageing equipment and safety violations. The blast occur
- Russian coal mine blast kills 21** 01:15 CET **bbc**, Translate : nl fr de el it pt es
 A methane explosion in a coal mine in southern Siberia has killed at least 21 people, Russian emergency services say. The blast happened as miners and rescue workers battled to contain a fire that had broken out on Tuesday in one of the mine shafts. At le

Summary

■ News statistics and visualisation

- Breaking News detection & visualisation
- Thematic Indicators, Trends and Statistics
- News Clustering and Geolocation of Stories
- News Maps, Crisis warning and analysis

■ Public URLs

- <http://press.jrc.it> (NewsBrief)
- <http://press.jrc.it/NewsExplorer> (News Explorer)
- <http://wt-public.jrc.it/SVGMap/Clive> (Live Maps)

Monday, December 20, 2004 6:35:41 PM CET

Latest News - World Edition

Updated every 10 minutes, 24 hours per day.

en - English

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DG Development
DG Economic & Financial Affairs
DG Education & Culture
DG Employment, Social Affairs
& Equal Opportunities
DG Transport
DG Energy
DG Enlargement
DG Enterprise & Industry
DG Environment
DG External Relations
DG Fisheries
DG Health & Consumer
Protection

Breaking News Level : (Medium)

Sikhs 4:37:00 PM CET**Theatre halts play after protest**

NEWScomAU 4:37:00 PM CET

From correspondents in London December 21, 2004 A THEATRE in the central British city of Birmingham decided today to halt performances of a controversial play after a weekend protest by resident Sikhs offended by the production....

Play axed after Sikh protests

guardian 4:34:00 PM CET

Sarah Left Monday December 20, 2004 The Birmingham theatre attacked this weekend in a violent protest by Sikhs today announced it was ending the run of a play that depicts murder and rape in a Sikh temple. Stuart Rogers, the executive director of the Birmingham.....

[More articles...](#)**Bush** 6:13:00 PM CET**Bush and Putin to hold February summit**

R 6:13:00 PM CET

At a White House news conference, President Bush acknowledged policy disagreements with Moscow - including over policy in Iraq - but insisted that the overall relationship between the two countries remained positive. "As you know, Vladimir Putin and I have a good relationship. Starting with our meeting....

Bush Looks At Road Ahead

CBSnews 6:09:00 PM CET

, who is facing rising criticism from Democrats and Republicans alike. Mr. Bush said Rumsfeld was doing a "very fine job" in challenging times. The president also said Bernard Kerik did the right thing in removing his name from consideration as Secretary of Homeland Security. This was Mr....

[More articles...](#)**Najaf** 4:32:00 PM CET**Ayatollah Ali Khamenei: Israel, U.S. Rigging Iraq Election**

iranvajahan 4:32:00 PM CET

TEHRAN -- Israeli and U.S. agents were behind bombings in Iraq's Shi'ite holy cities of Kerbala and Najaf, Iran's Supreme Leader said Monday, accusing Tehran's arch-foes of trying to rig Iraq's elections for

Augusto Pinochet 5:35:00 PM

CET

Chilean Court Upholds Pinochet Indictment

guardian 5:35:00 PM CET

Monday December 20, 2004 4:17 PM AP Photo XRC105 SANTIAGO, Chile (AP) - An appeals court Monday upheld the indictment and house arrest of former dictator Gen.

European Commission**European court set to decide on Microsoft**

R 6:19:00 PM CET

EC publishes ALROSA-De Beers diamond sale quota bids (corr)

tass-en 6:21:00 PM CET

[More articles...](#)**Commissioners in the news****EU entry talks with Turkey: Just the beginning of a long, tough process**

TurkishDailyNews 2:41:00 PM CET

European Union Entry Talks With Turkey Will Bring Uncertain Future For Both

arabworldnews 1:03:00 PM CET

[More articles...](#)**European Parliament****Batteries: Commission welcomes political agreement in the Council**

dg-press-en 4:47:00 PM CET

EU fish ministers to vote on software patents

register 4:34:00 PM CET

[More articles...](#)**Court of Justice****European court set to decide on Microsoft**

R 6:19:00 PM CET

Siemens drops appeal against Alstom bailout

expatica 5:05:00 PM CET

[More articles...](#)**Court of Auditors**

Wednesday, October 27, 2004



Barroso backs down over EU vote fr de it nl

A vote to approve the new European Commission has been delayed after the incoming president withdrew his proposed line-up of commissioners. | Jose Manuel Barroso said more time was needed to choose a ... (photo: EC)