The 2010 eruptions at the ice-capped Eyjafjöll volcano, South Iceland

Presented by
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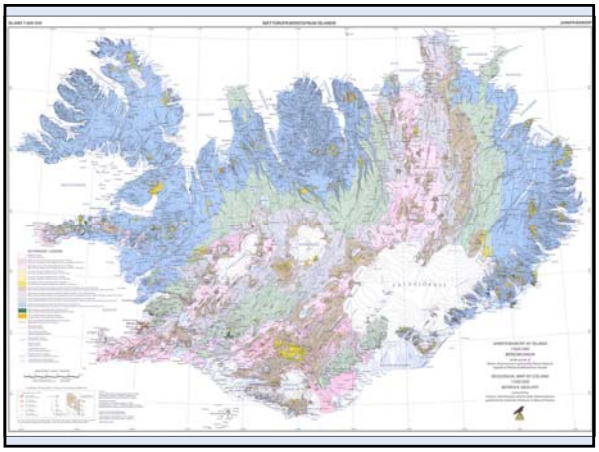
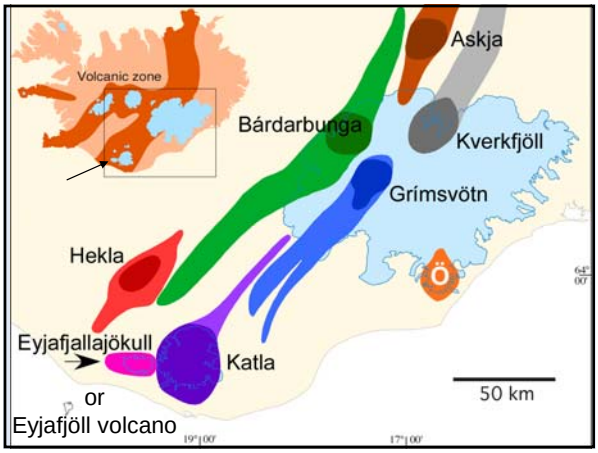
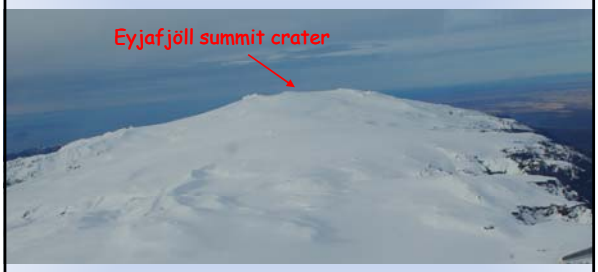
Iceland Meteorological Office





Eyjafjöll volcano 2009



Eyjafjöll eruptions - course of events:

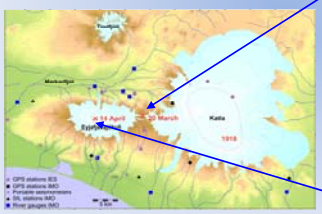
1994, 1999, 2009 and **Jan-March 2010**:

Unrest and magma injections

20 March to 12 April – small flank eruption at Fimmvörðuháls – basalt – effusive

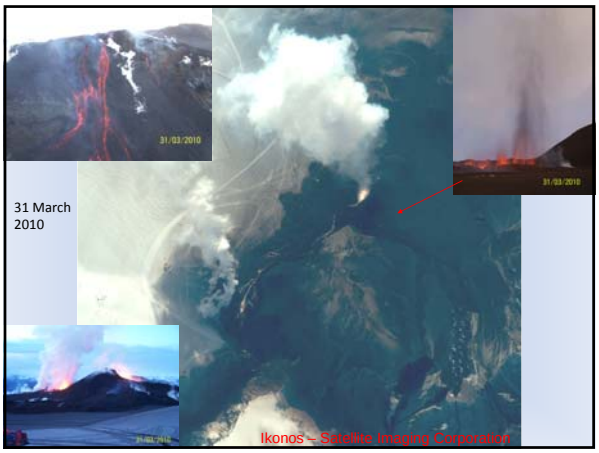
14 April to 23 May – eruption in summit crater – trachyandesite – mostly explosive

Fimmvörðuháls eruption

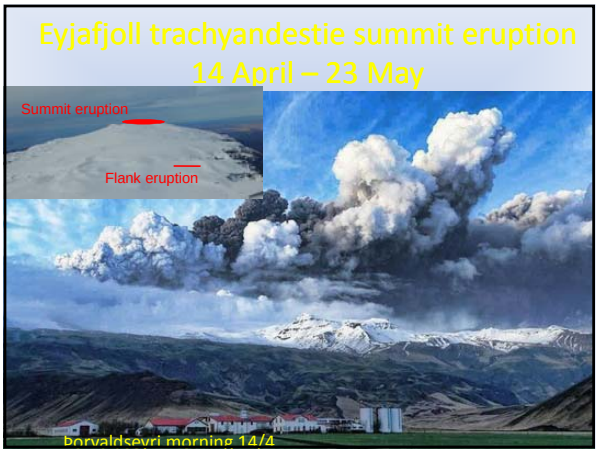


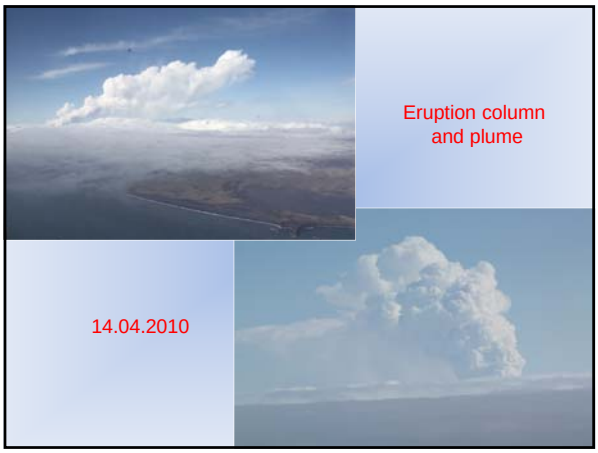
Eyjafjöll summit eruption

Fimmvorduhals basalt fissure eruption

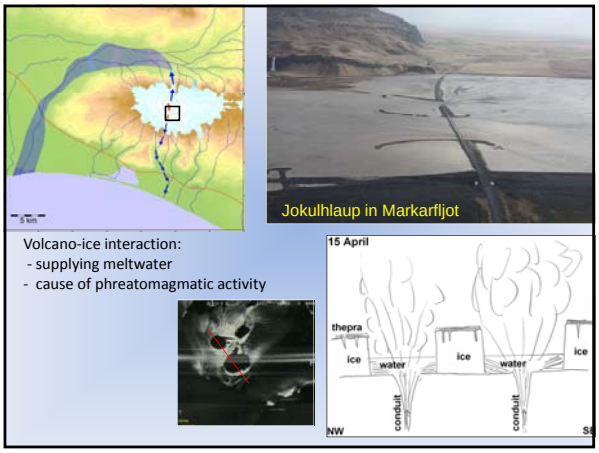

31 March
2010
Ikonos – Satellite Imaging Corporation

23 March 2010
31 March 2010
31 March 2010
1 April 2010

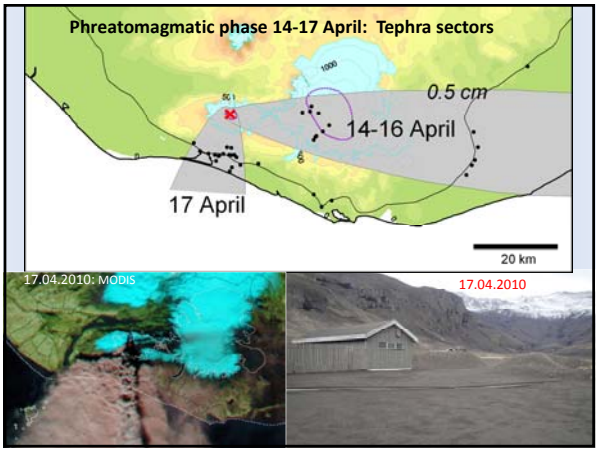

Eyjafjoll trachyandestie summit eruption
14 April – 23 May
Summit eruption
Flank eruption
Þorvaldseyri morning 14/4

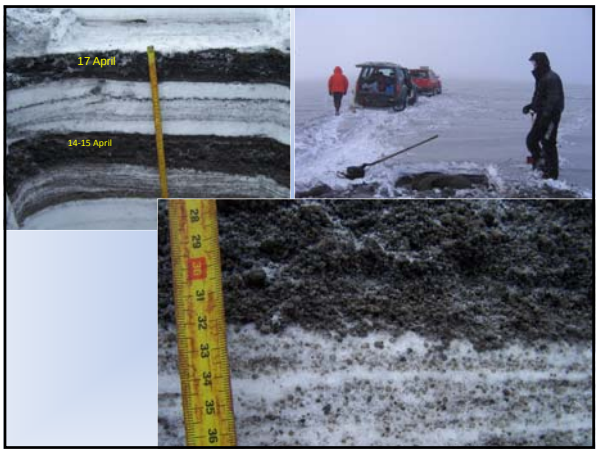

Eruption column
and plume
14.04.2010

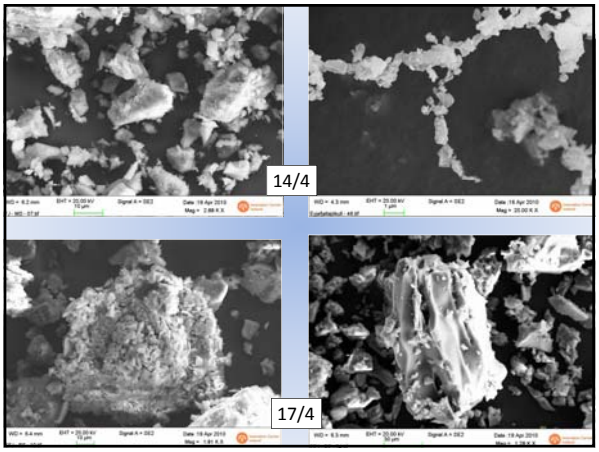
15 April 19:04

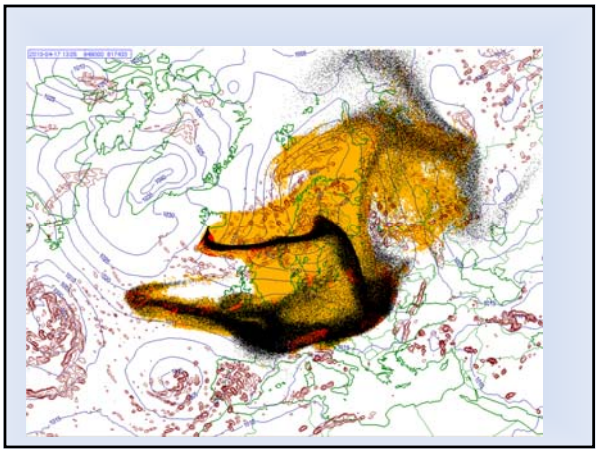

Jokulhlaup in Markarfljot
Volcano-ice interaction:
- supplying meltwater
- cause of phreatomagmatic activity
15 April
thepra
ice
water
ice
water
ice
conduit
conduit
NW

16 April ca.21:00

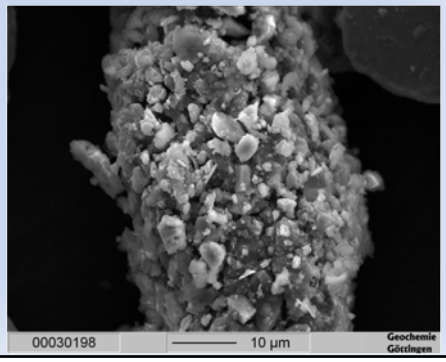



17 April
14-15 April


14/4
17/4

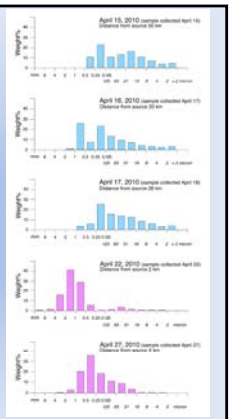


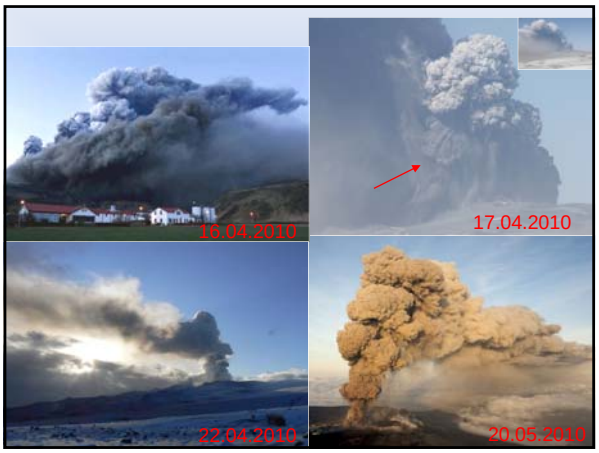
Gerhard Wörner: "The ash was sampled in Goettingen on April 24, but it was deposited between 21 and 22 of April, when we had a little rain"

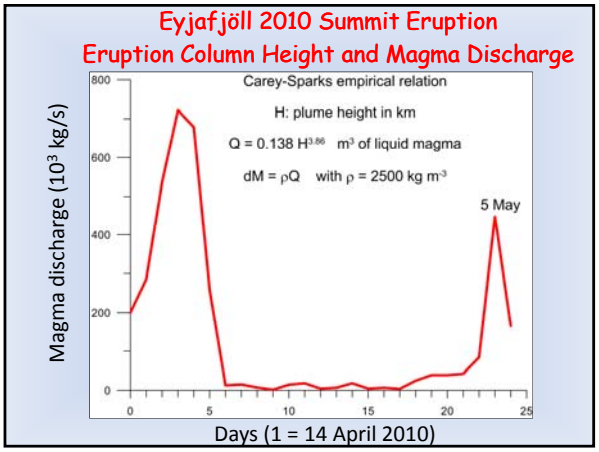


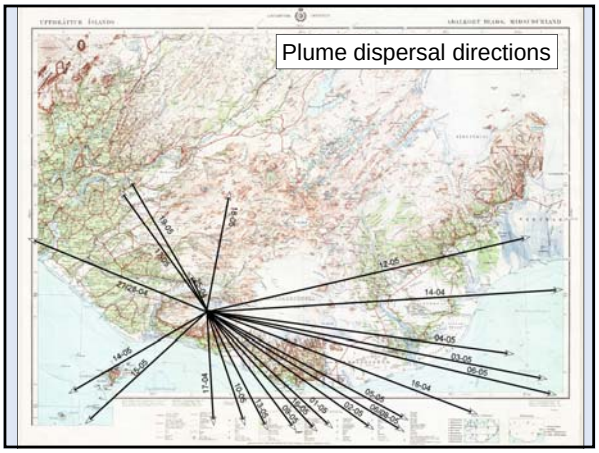
21 April

Very weak and ash-poor eruption column




16.04.2010
17.04.2010
22.04.2010
20.05.2010


Eyjafjöll 2010 Summit Eruption
Eruption Column Height and Magma Discharge
Carey-Sparks empirical relation
H: plume height in km
Q = 0.138 H^3.86 m³ of liquid magma
dM = ρQ with ρ = 2500 kg m⁻³
5 May
Magma discharge (10³ kg/s)
Days (1 = 14 April 2010)


Plume dispersal directions

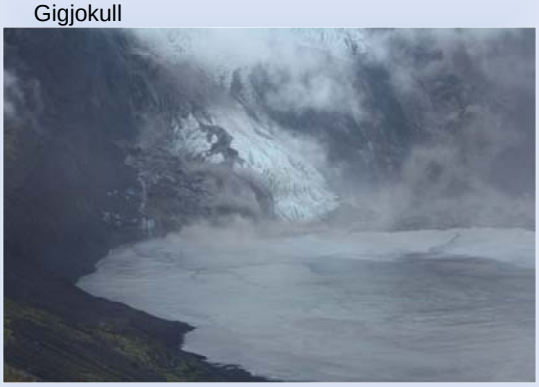
02.05 2010

Vodafone Iceland

BEFORE

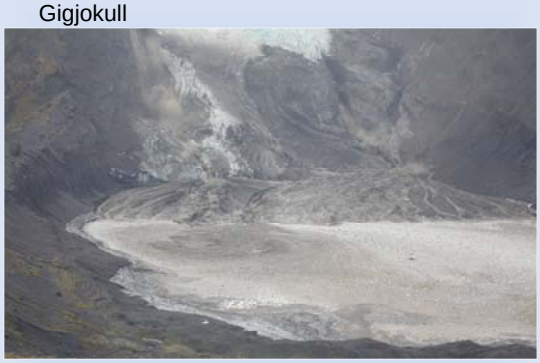
AFTER

Gigjokull



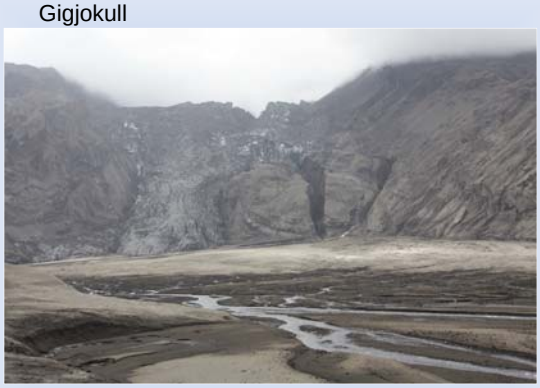
14 April 2010; ~10:00 hrs

Gigjokull

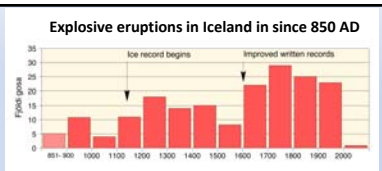


14 April 2010; ~15:00 hrs

Gigjokull



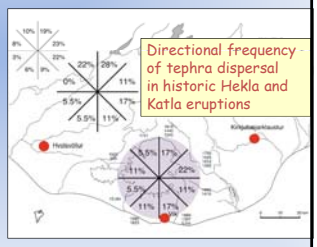
27 May 2010



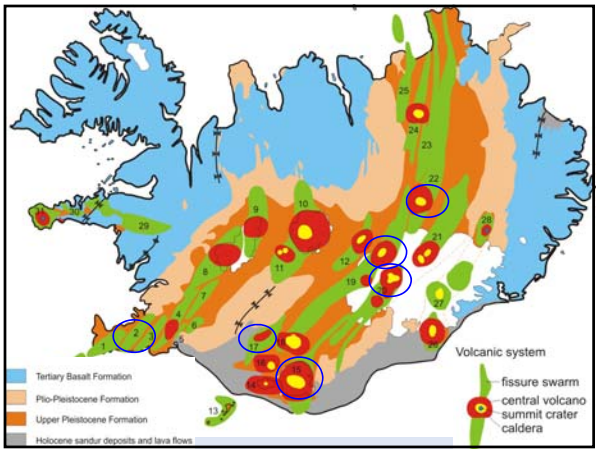
20-25 eruptions/100 years
Explosive events = 80%

Most layers small <<0.1 km^3

Distribution: Most common transport is to E and NE



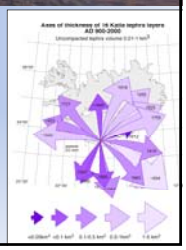
From G. Larsen unpubl. 2010

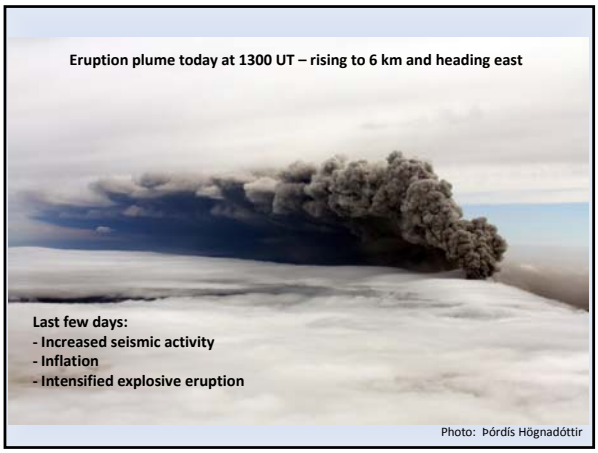


What about Katla – will it be worse?

Katla eruptions since 900 AD:

Size		Tephra bulk volume
Large	6	>0.5 km^3
Medium	5	0.1-0.5 km^3 ← **E-2010**
Small	9	<0.1 km^3

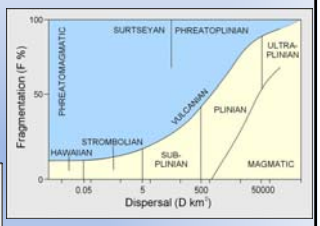
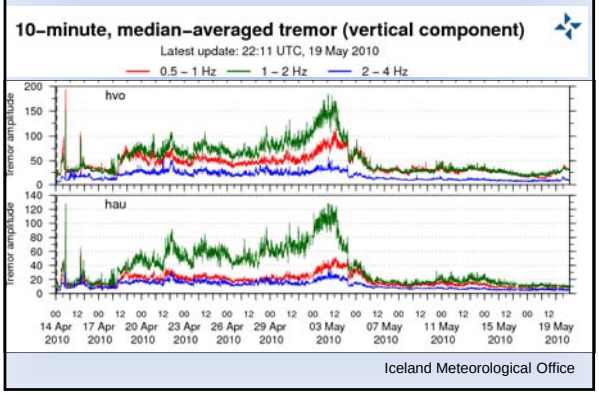




Walker's classification - 2

F, fragmentation index

D, dispersal index



Volcanic Tremor