A look back at the 2011 Cyclone Season in Oman

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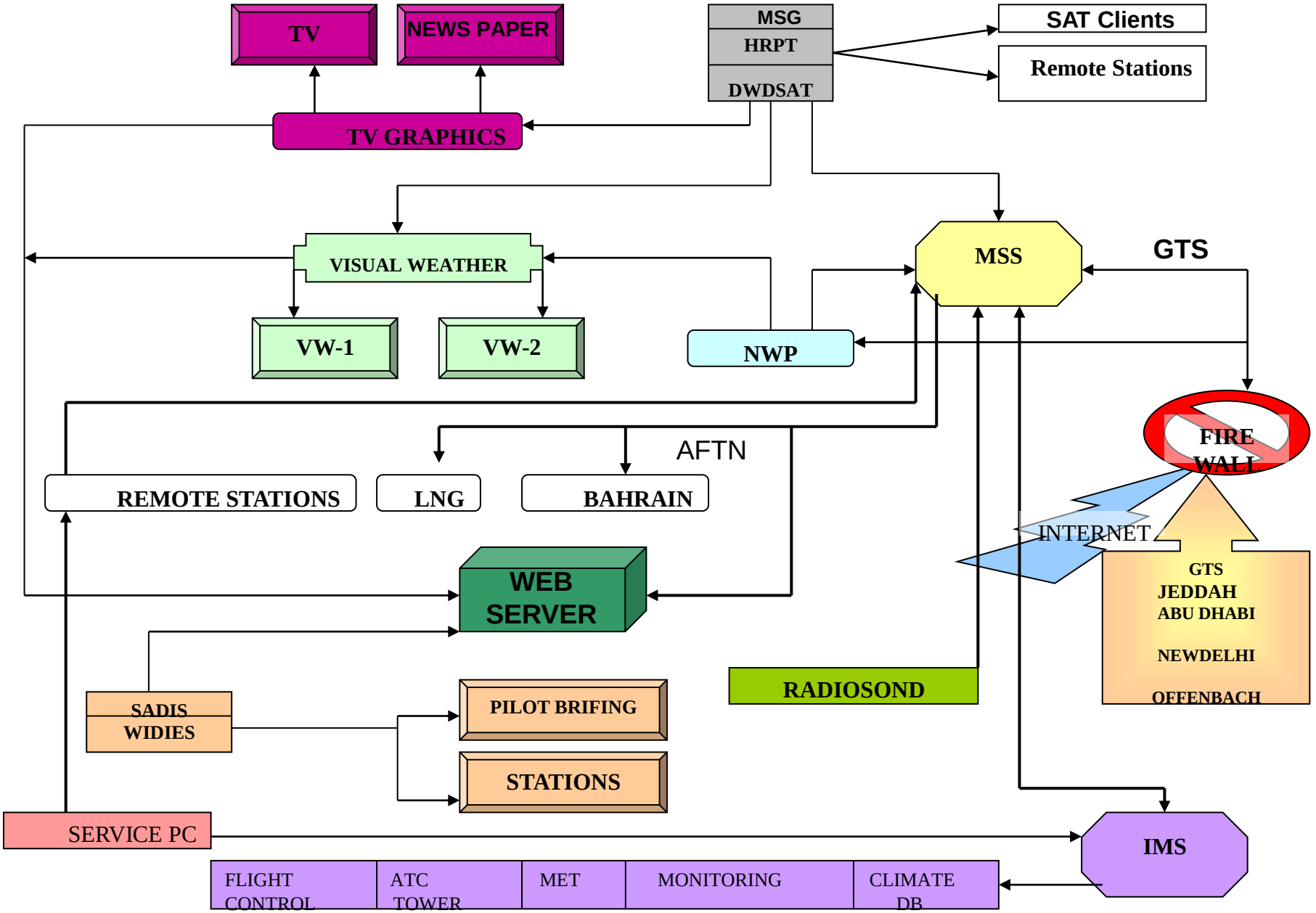
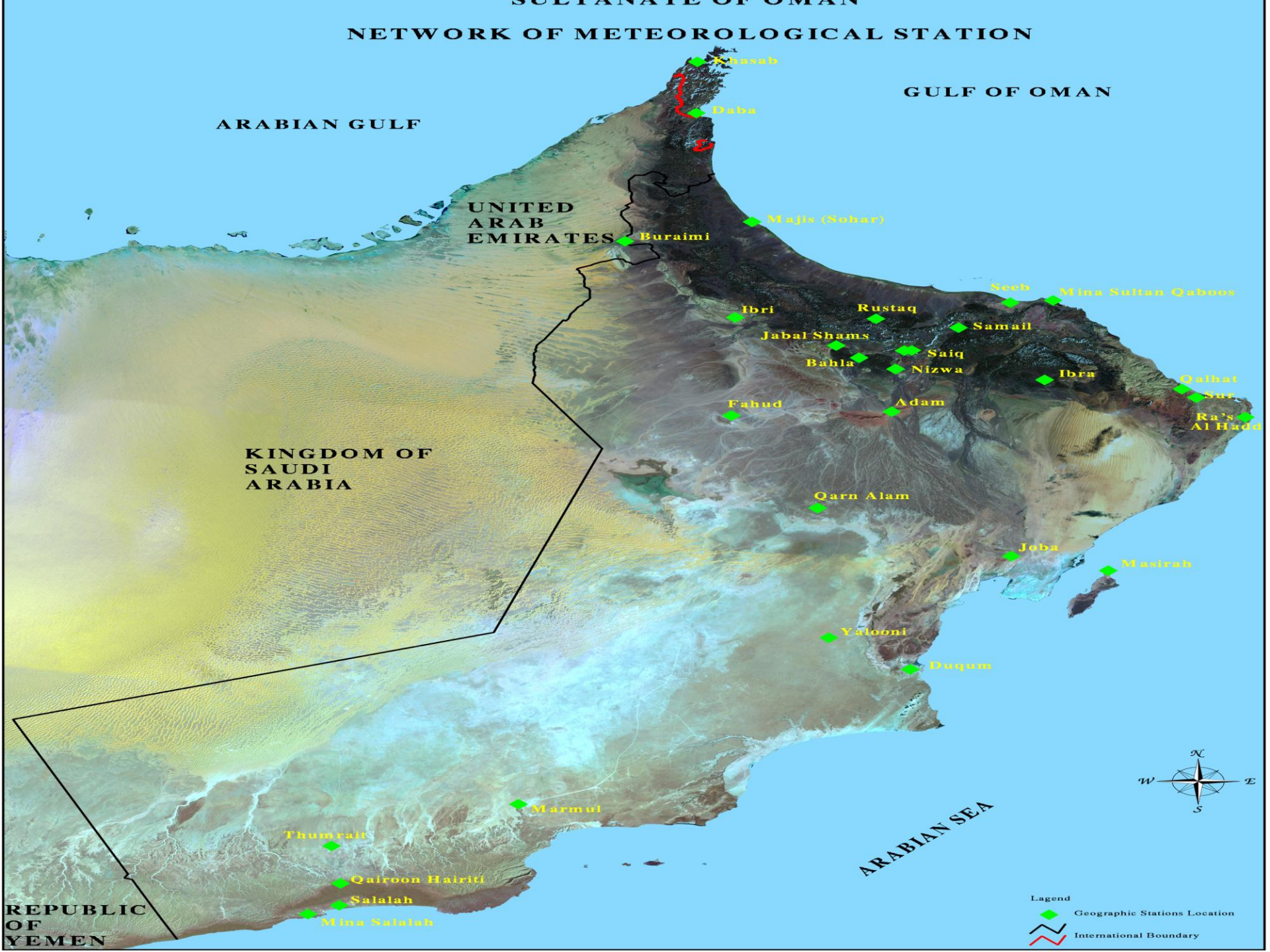
Public Authority of Civil Aviation
Muscat, Sultanate of Oman

OMAN METEOROLOGICAL NETWORK




SULTANATE OF OMAN
NETWORK OF METEOROLOGICAL STATION
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Jabal Shams
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REPUBLIC OF YEMEN
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Geographic Stations Location
International Boundary

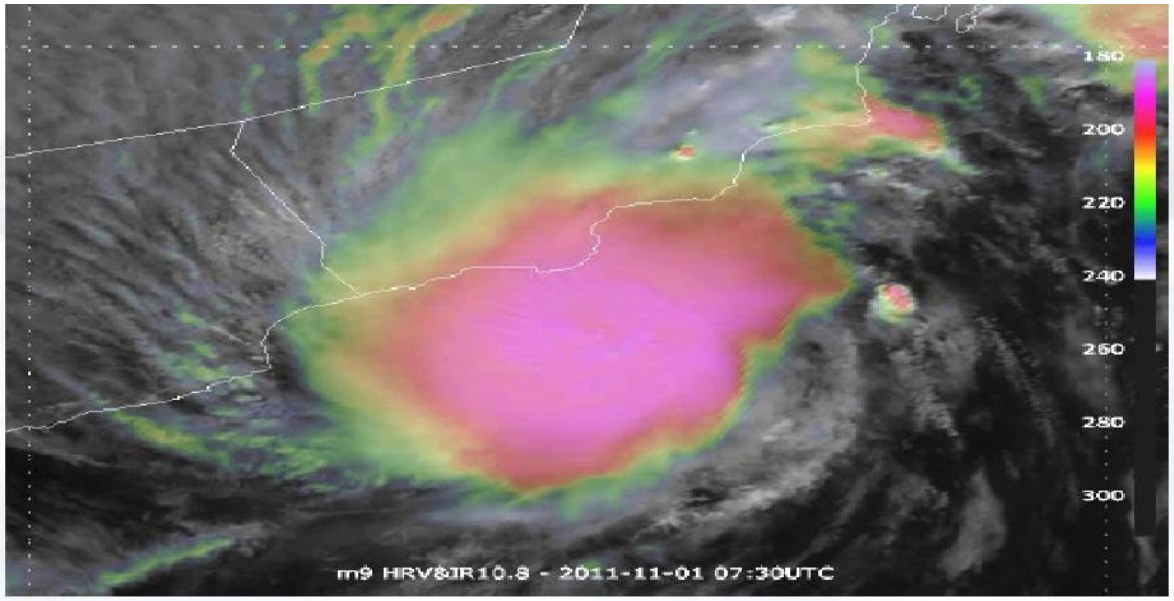
A look back at the 2011 Cyclone Season in Oman

- There are two main seasons for tropical cyclone formation in the Arabian Sea.
- The 1st season is the Pre-monsoon season during May and June.
- The 2nd season is the post-monsoon season during October and November.
- There were no significant tropical disturbances to affect Oman in the first tropical cyclone season last year.
- However, Oman was affected by a series of three tropical systems within one month time in the second season.
- A number of warnings were issued to the public and fishermen during each case.

1. Tropical storm ‘KEILA’ (29 October- 04 November, 2011)

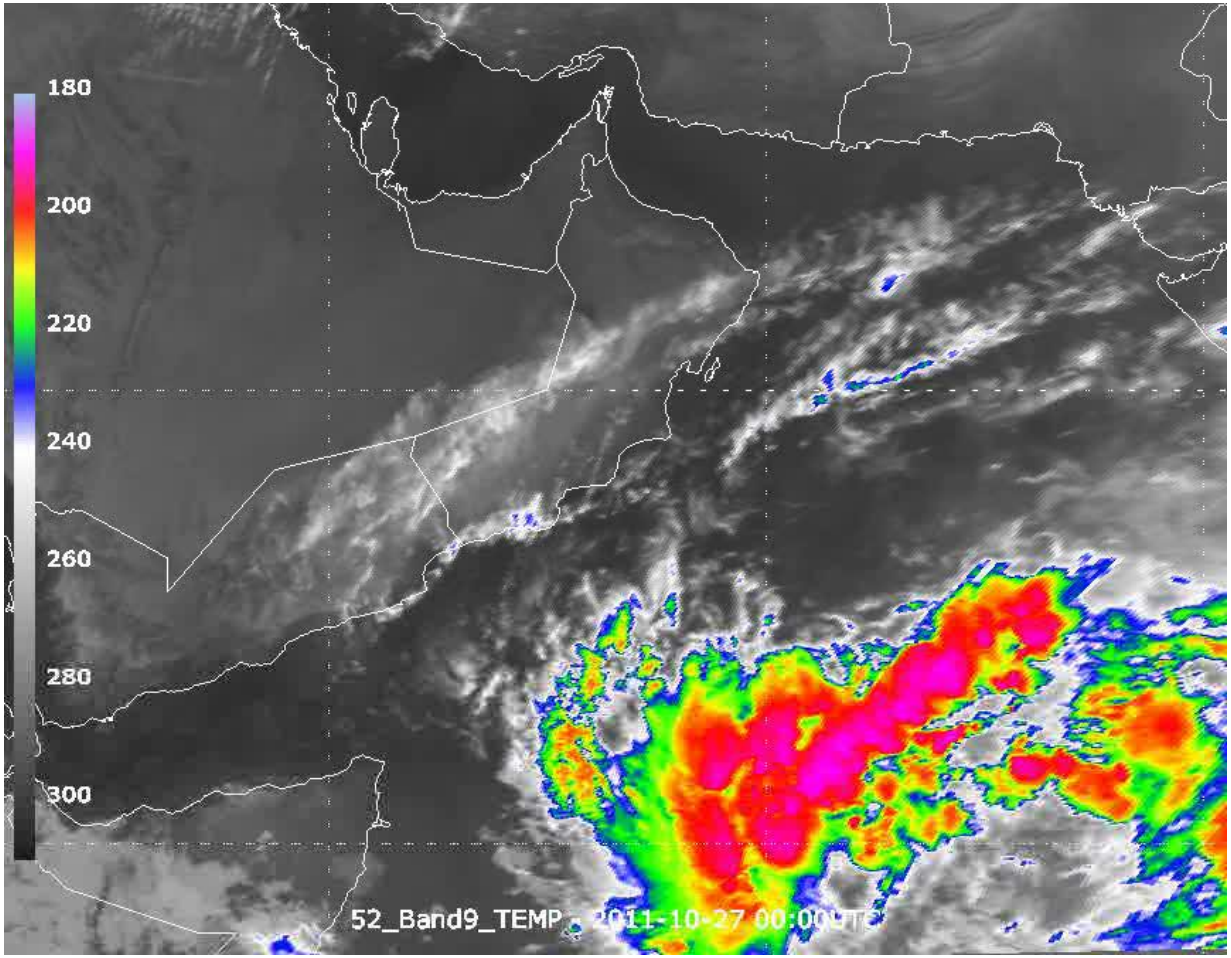
- This system started as a cluster of thunderstorms associated with the ITCZ south east of the Arabian Sea in the last week of October.
- It gradually organized into a low pressure area on 27th of October.
- The low gained more intensity as it moved westward and was classified as a deep depression on October 29th

Meteosat image of Keila taken on November 1st at 7:30 UTC.



Meteosat-9 HRV&IR10.8
1st & 2nd Nov 2011 03:00-13:00UTC

EUMETSAT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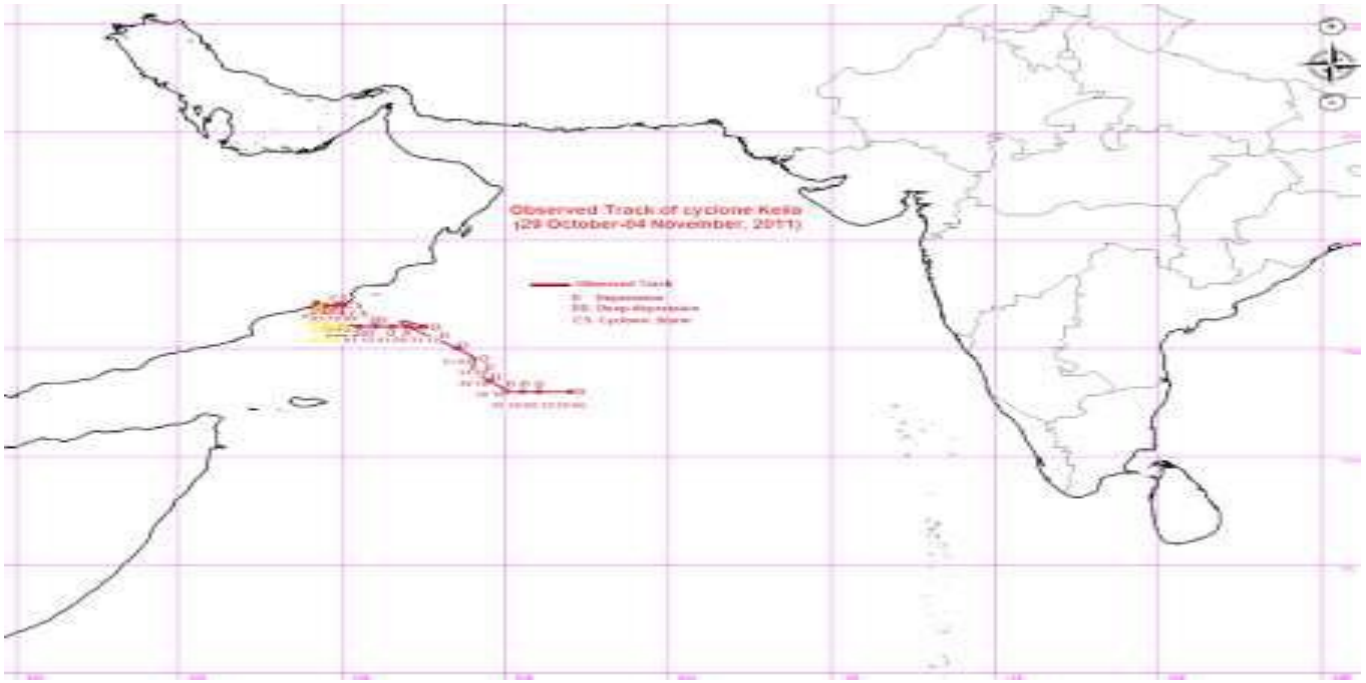
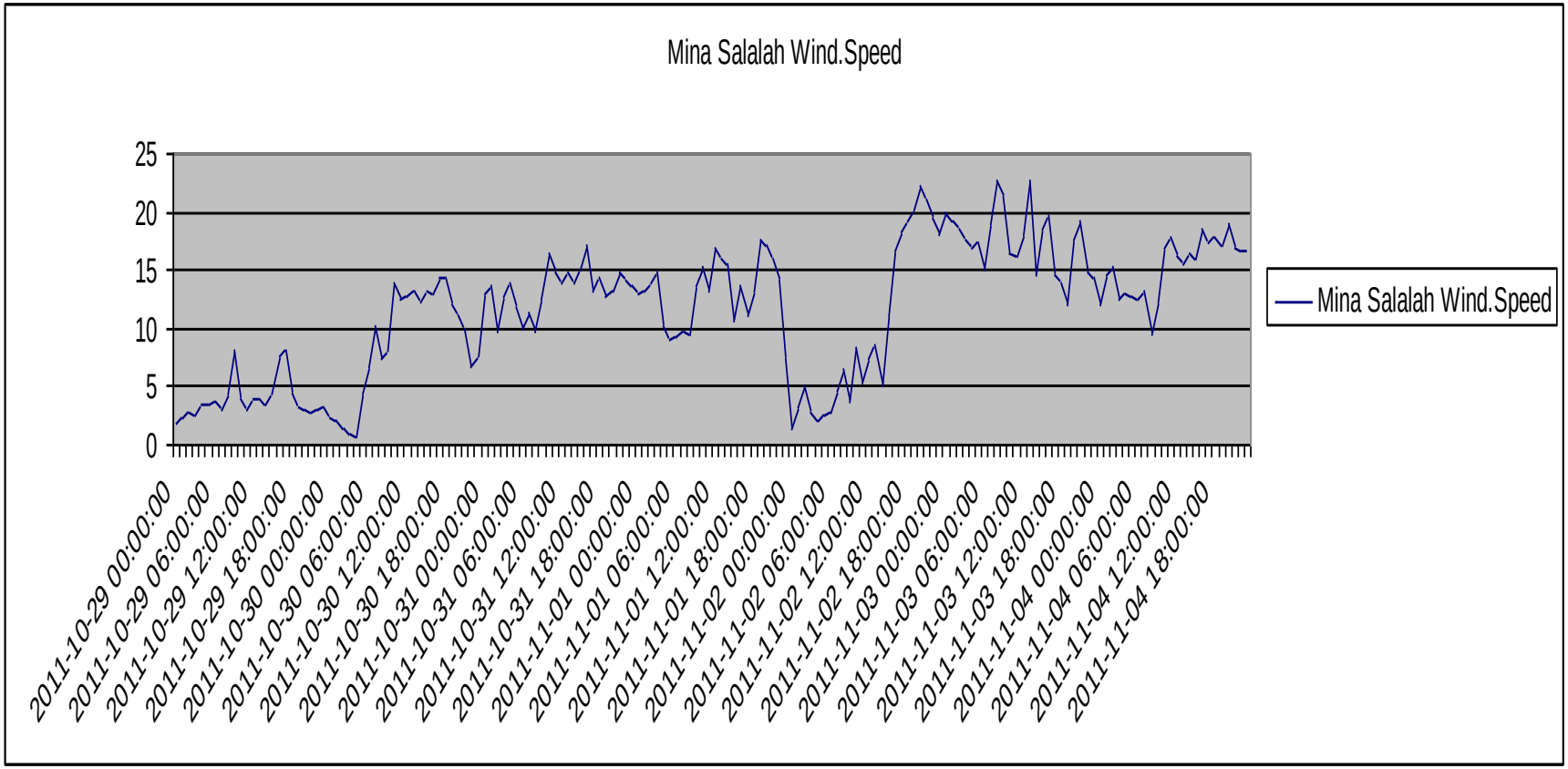
Track of Keila over the Arabian Sea during the period from 29th October to 4th November, 2011 (courtesy of RSMC).



- For a short while between 03-18 UTC on November 2nd, the classification was upgraded to a cyclonic storm by RSMS with 35 Kt estimated surface wind speed.
- However, Oman Met center kept the classification as a deep depression in accordance with available weather observations close to the center of the system.
- The system made landfall north of Salalah on November 2nd before weakening gradually. The highest surface wind speed recorded in Salalah (very close to where Keila made landfall) on November 2nd was 23 kt only and the lowest recorded MSLP was 1000.5 hpa.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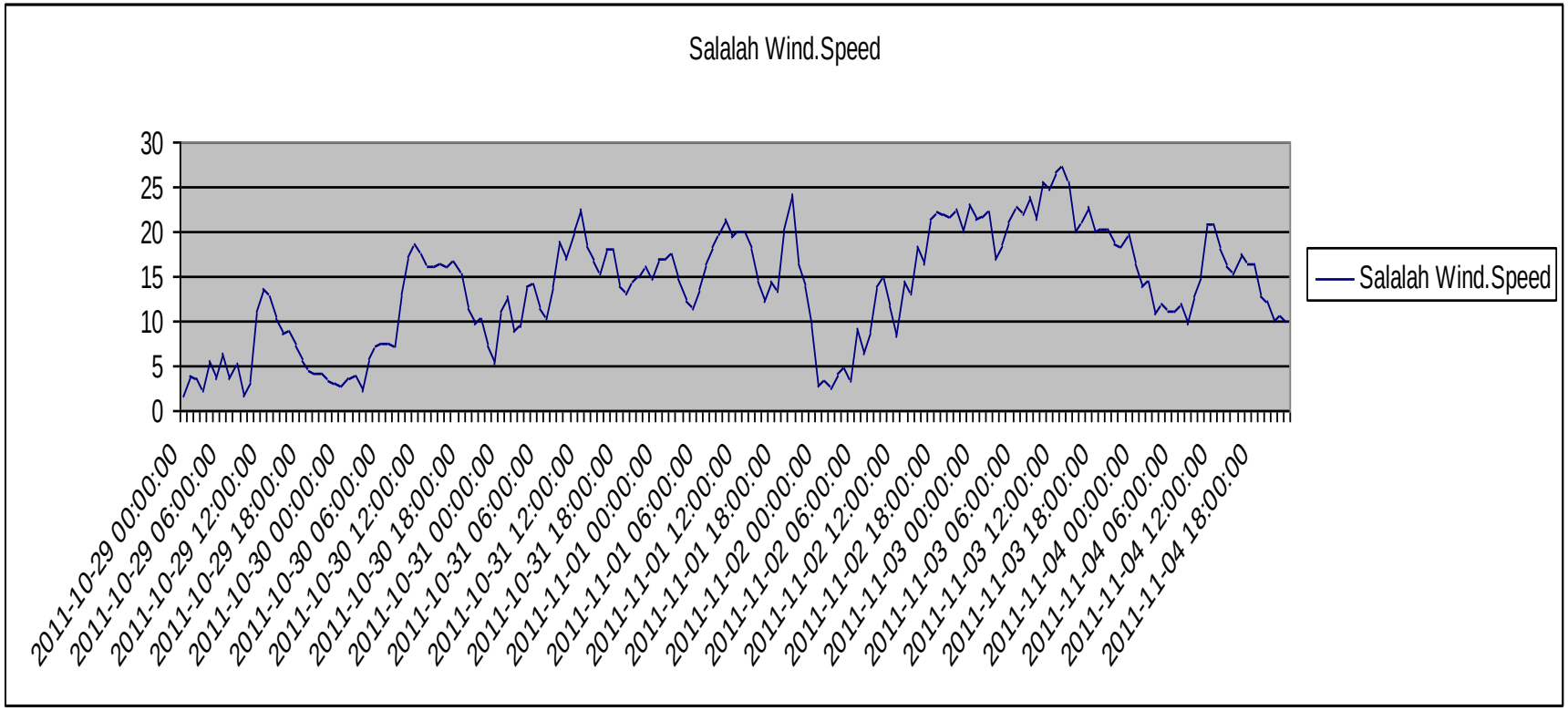
Mina Salalah Wind.Speed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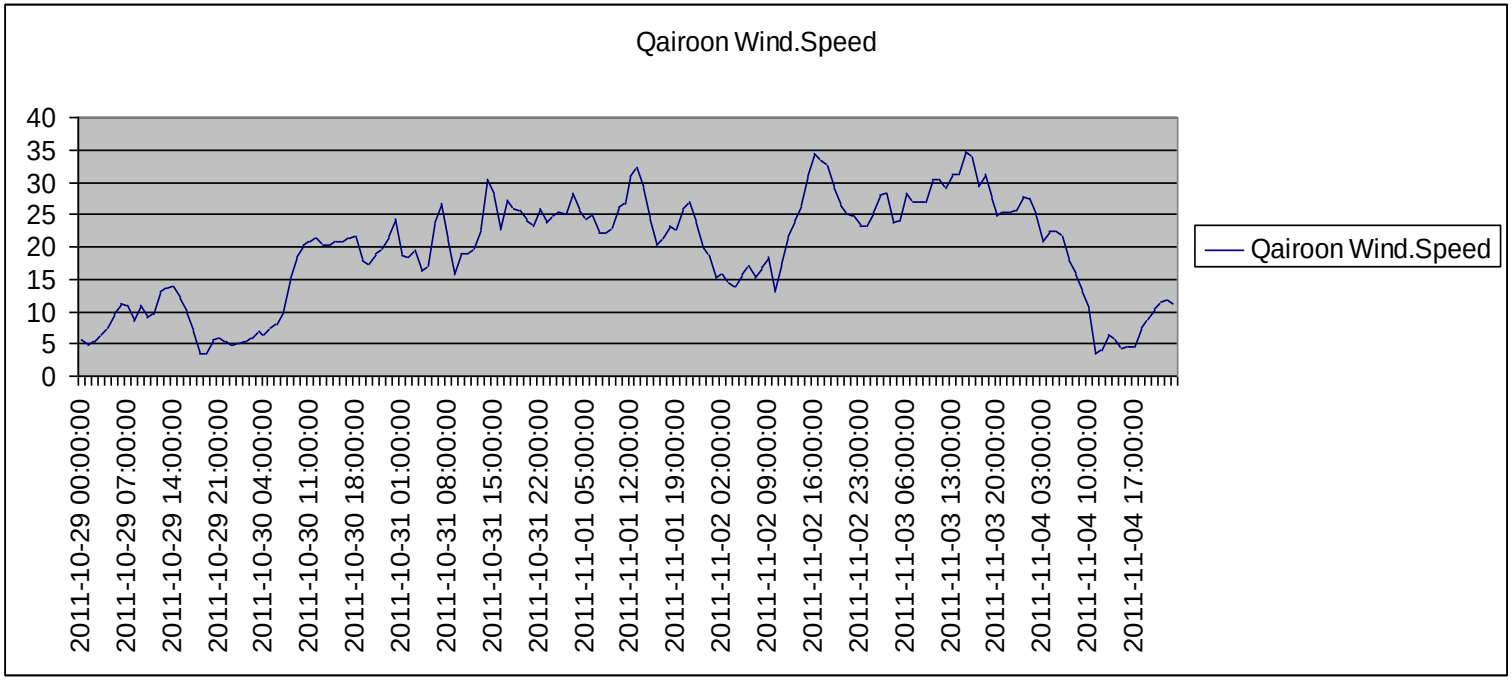
Salalah Wind.Speed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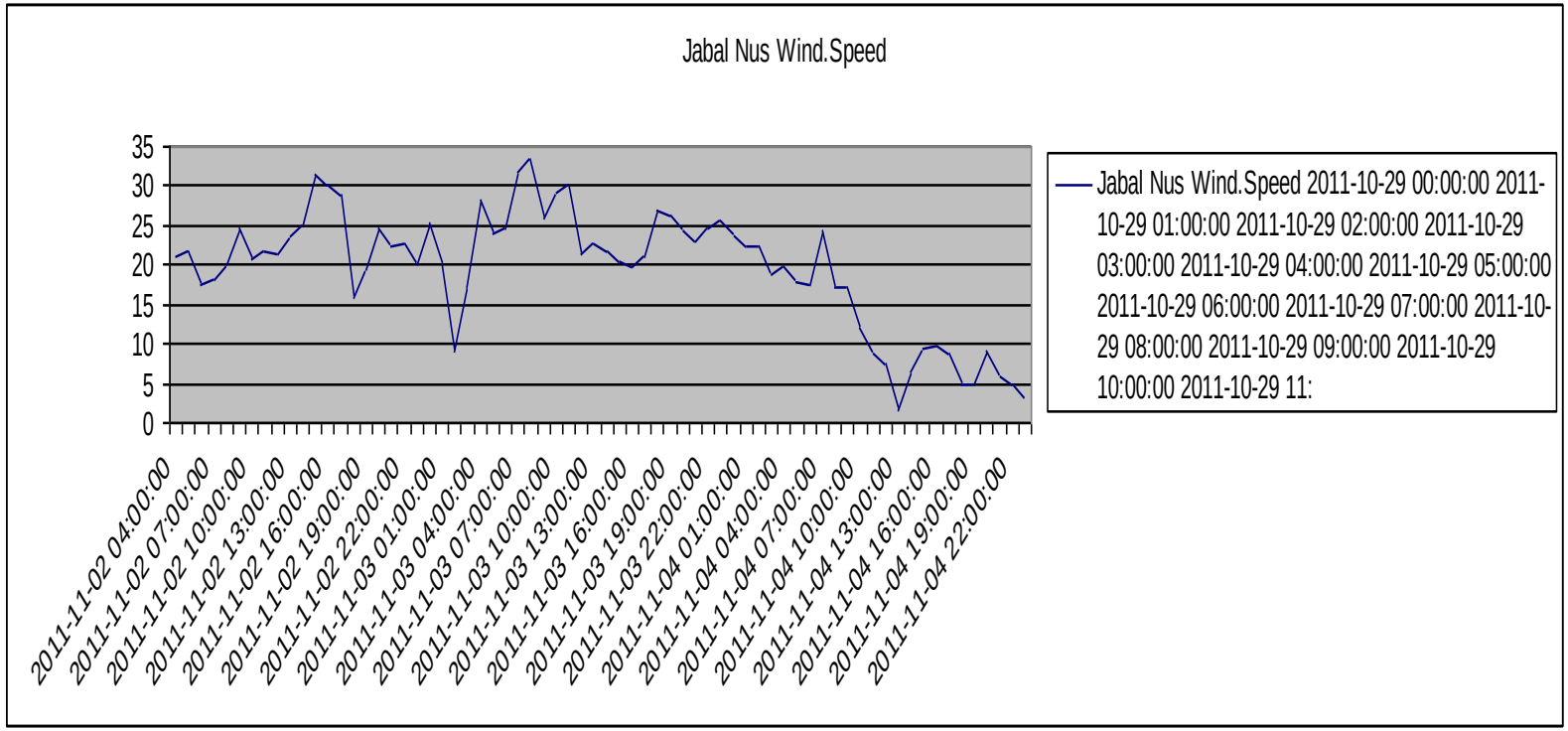
Qairoon Wind.Speed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- The system brought moderate to heavy rains across the Sultanate causing the death of 12 people as well as a lot of property damage.
- It is interesting to note that there were no deaths reported in the southern part of the country where Keila made landfall.
- Instead, all the deaths occurred in the northern part of the country as the availability of moisture brought by Keila triggered local thunderstorms over Al-hjir mountains which led to several flash flooding events.

OMAN DAILY
Observer

12th death confirmed as tropical condition gets over

Sat, 05 November 2011

MUSCAT — The Directorate General of Meteorology and Air Navigation has announced the conclusion of the tropical condition impacting the Governorate of Dhofar which, the authority said, relegated from deep tropical depression to low pressure on its way to vanishing gradually over the next 24 hours, with chances of intermittent rains in the governorate.

The Met office pointed out in a statement here yesterday that, along with the gradual depletion of the tropical condition, the associated dangers will continue to diminish and relief tasks can be started as the skies are clear enough for helicopters and vehicles to operate while still maintaining high degrees of caution. The department called upon relief teams to exercise extra caution when crossing wadis and low-lying areas.

The Met office also urged fishermen and other seafarers with business along the coast of Dhofar and Al Wusta Governorate to check out the condition of the sea in the next 24 hours before venturing out.

Downpour unleashes chaos in Muscat

Thu, 03 November 2011

Heavy rains throw normal life out of gear with impassable roads, snarling traffic -

By Observer Staff -

MUSCAT — Muscat's first major downpour in nearly a year unleashed chaos in many parts of the city, triggering gridlock along major carriageways, inundating neighbourhoods, and sparking an airborne evacuation of flood-hit Al Nahdha Hospital in the heart of the capital.

Thousands of motorists were trapped in their vehicles for as long as five hours as flooded streets and busted traffic signals set off lengthy tailbacks extending for several kilometres in several areas of the capital.

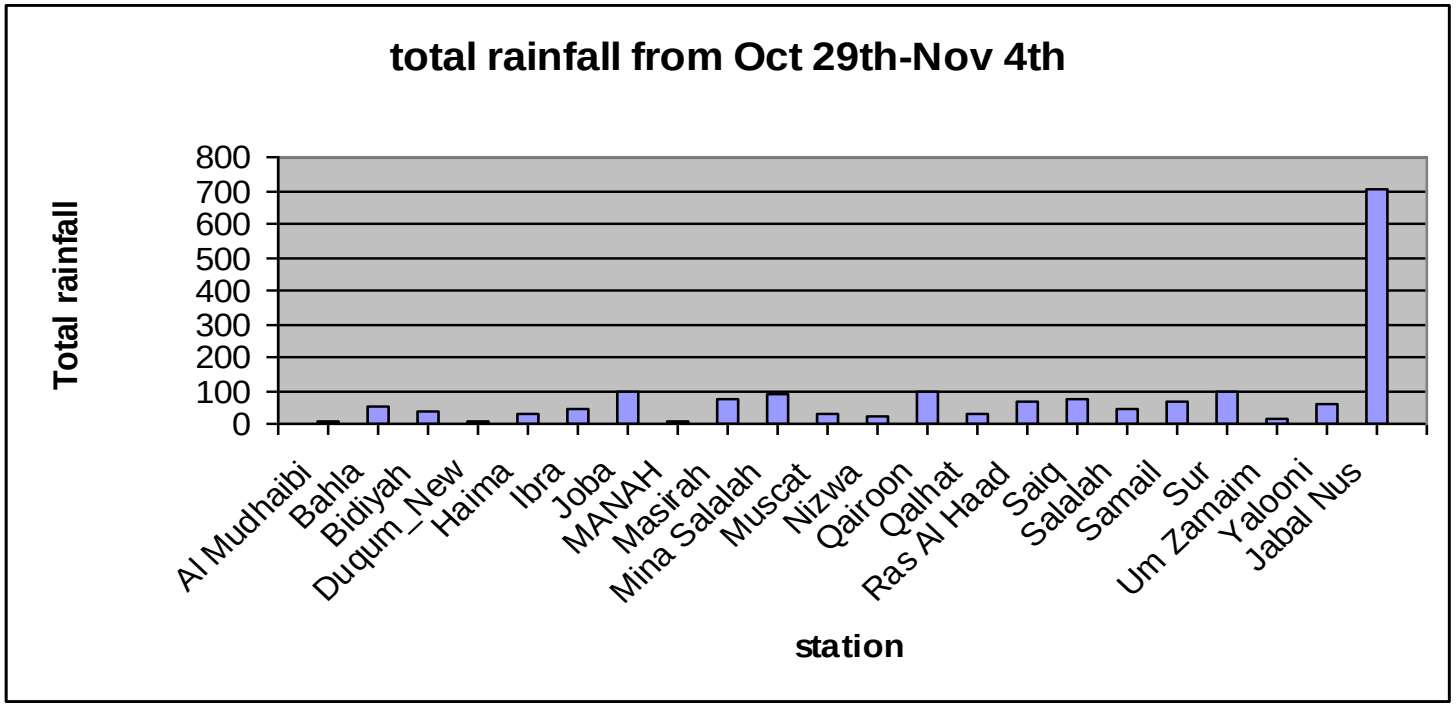
Worst affected were the Wadi Kabir — Ruwi, Hamriya-Qurum, Wadi Adai-Al Amerat, Central Corridor, and Darj al Sahwa — Nawaloh stretches.

In scenes reminiscent of the devastation wrought by Tropical Cyclone Gonu in 2007, dozens of cars were swept away along the Hamriya-Wadi Adai section in a surge of flood water unprecedented in this neighbourhood.

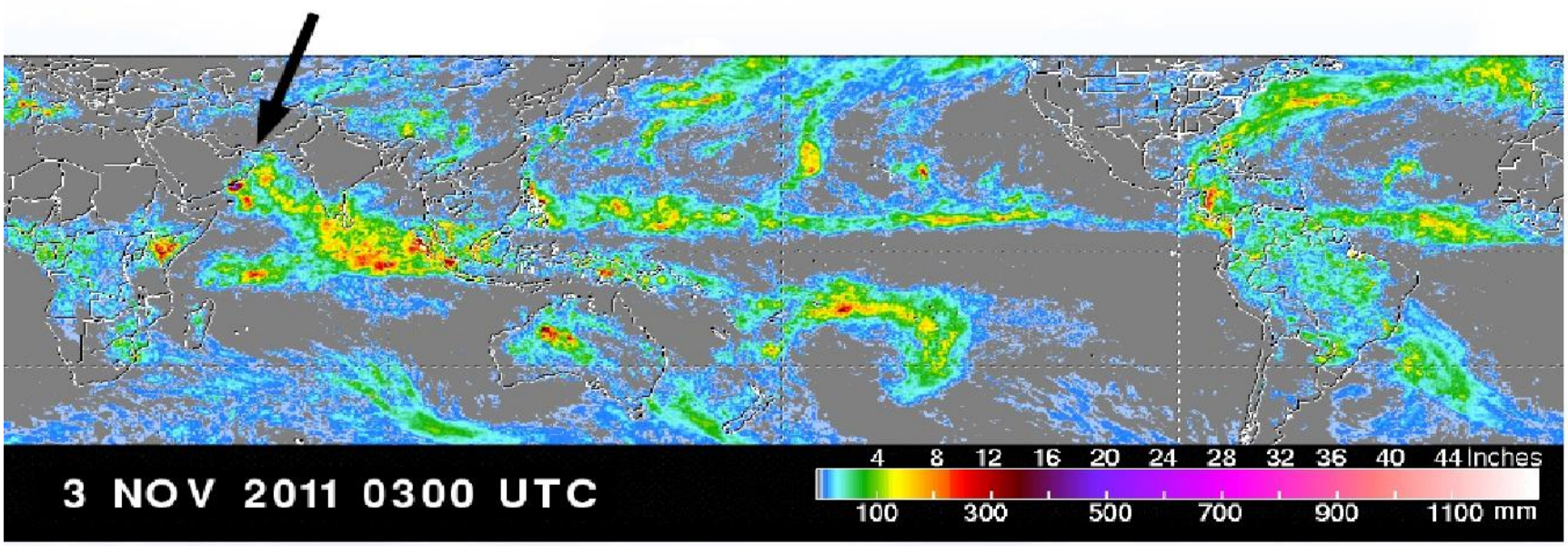
"We were stuck in traffic on the outbound section of the carriageway at around 1.30 pm yesterday when we noticed that the flooding was getting worse along this stretch. At this point, motorists started abandoning their cars and fleeing to high ground. Around 40 cars were tossed about and left submerged in the muddy torrent. My car was a complete write-off," Bader, a resident of Hamriya, told the Observer. The torrent alarmed many local inhabitants unused to the sight of a raging flood tearing through their neighbourhood. Coursing down the Yiti road, the deluge brought with it mud, stones and other debris. Parts of the blacktop have been ripped away as well.

Hilal al Wahaibi, another long-time resident of Hamriya, commented: "I've never experienced anything like this in the more than 25 years I've

Total Rainfall recorded in Oman Met stations from Oct 30th to Nov 4th 2011.



TRMM total rainfall accumulation during the period from October 27th until November 3rd 2011.



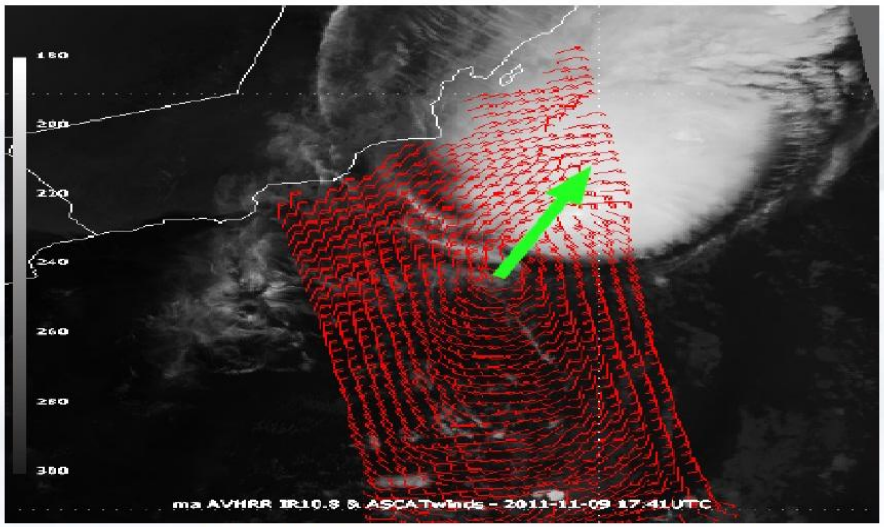
TRMM rain accumulation
27 Oct - 3 Nov 2012

2. Deep Depression over the Arabian Sea (06-10 November 2011)

- A low pressure formed over southeast Arabian Sea on 4th November 2011 in association with an active ITCZ.
- This low intensified into a depression on November 6th with 25 kt estimated surface wind speed around the center.
- The depression moved towards west-northwest direction and intensified further into a deep depression on November 8th.

- The approach of a westerly trough and relatively cold sea surface temperatures (26-28 C) did not allow the deep depression to intensify further and it weakened gradually on November 9th and 10th.

ASCAT winds indicating a separated low level circulation on November 9th.



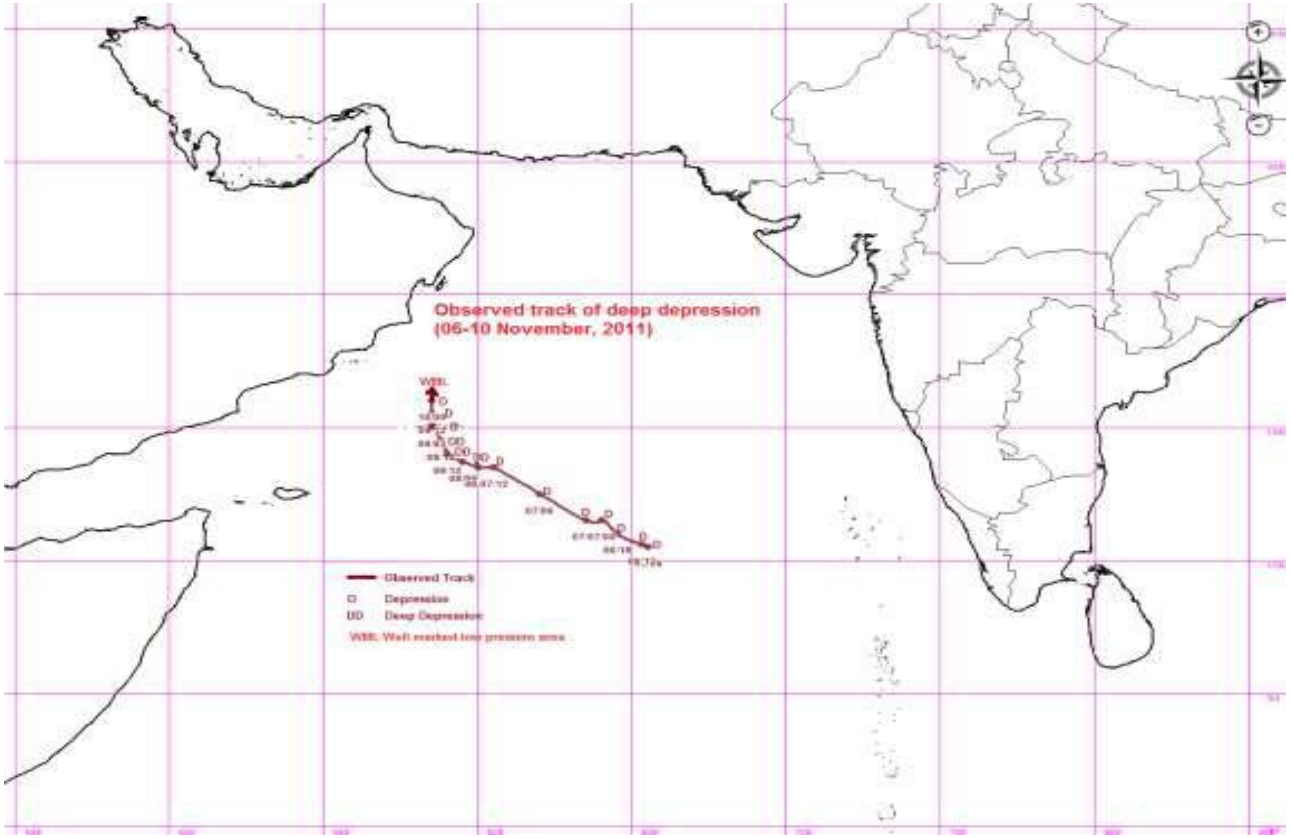
Metop-A AVHRR IR10.8 & ASCAT winds
9 Nov 2011 17:41UTC

higher-level convection being "torn off" low-level circulation indicatin decaying storm

→ tilted vertical rotation axis

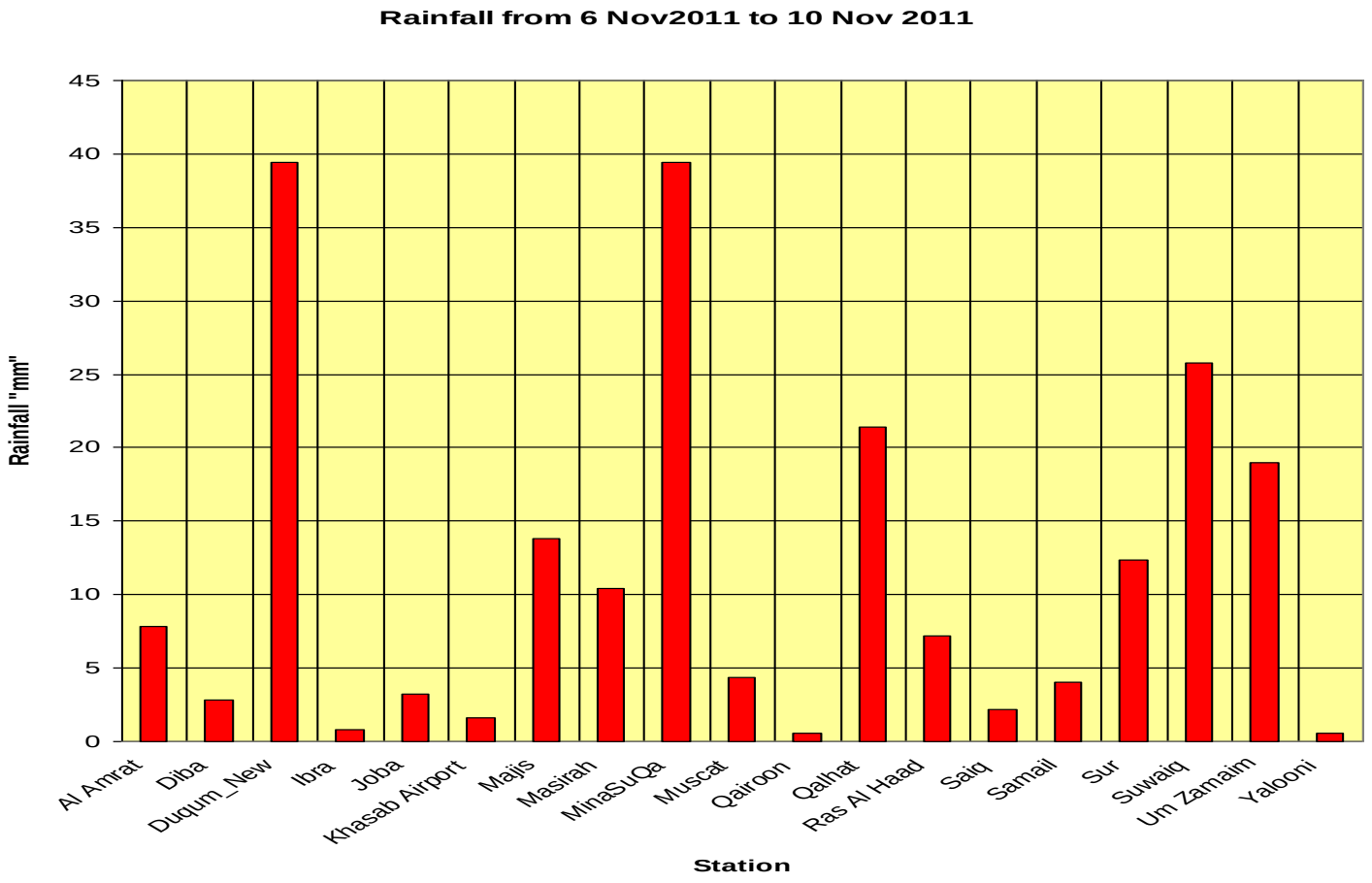
EUMETSAT

Track of the deep depression over the Arabian Sea during the period from 06-10 November 2011 (courtesy of RSMC).



- Even though this deep depression did not make landfall, moderate to heavy rains and rough seas were reported as it moved closer to Oman coasts.
- However, there were no reports of any casualties

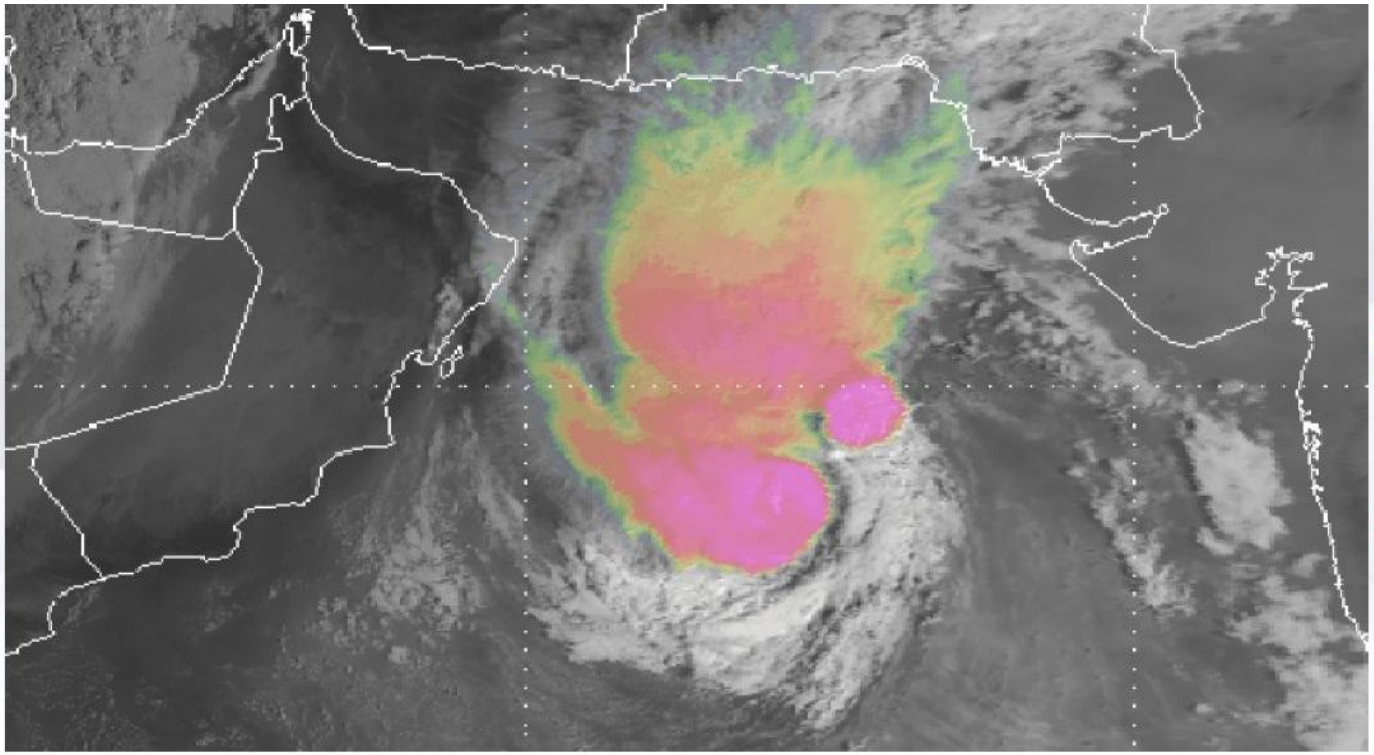
Total rainfall amounts recorded in Oman during the period from 6-10 November 2011



3. Deep depression over the Arabian Sea (26 November to 1st December, 2011)

- A depression formed over the Comorian area on 26th of November and moved west-northwestwards.
- It intensified further into a deep depression before it weakened gradually and dissipated near Oman Coast on 1st of December after encountering cold sea surface temperatures and increased vertical wind shear.
- No rains were reported in Oman during this period. However, fishermen were warned about rough seas as the system approached Oman coasts.

The satellite image taken on 30th November clearly shows the vertically tilted circulation which led to the gradual dissipation of the system.



convective cloud (R10.8) moving off low-level circulation (HRV)

→ tilted vertical rotation axis

Meteosat-9 HRV&IR10.8
30 Nov 2011 04:00-08:00UTC

EUMETSAT

Some Issues to Think about

- The difference in the classification provided by RSMC and JTWC due to to the difference in the criteria used to estimate wind speed.
- More communication between panel members and RSMC is needed by calling or by video conferencing.

- Thank you…….