AQ: The axis of the ridge is moving over California. PM2.5 levels in the SJV are generally low to moderate, except that Fresno has had an extended period of (hourly) 40-55 ug/m3 over the last three nights. The SJV APCD forecaster is unsure as to the cause and speculates it has something to do with a shallow inversion and/or wood smoke. Overall, PM2.5 levels should build by a couple of ug/m3 each day from yesterday to Wednesday of next week – a sustained event. In the DISCOVER-AQ flight area (south SJV) Friday should be the peak day; traffic is generally higher, which may contribute. Weekend levels should drop only slightly (~upper 20’s ug/m3) and then levels should build into next week to mid-upper 30’s ug/m3 by Tuesday and/or Wednesday. The SJV should be cleaned out by Thursday. The situation should be similar in the north SJV (Sacramento, Yuba City) for PM2.5, but the north SJV is starting cleaner than the south SJV, so levels should stay a little lower there.

Weather:
Friday –
SJV (PODEX/D-AQ) – Fog in the morning similar to today, burning off by 9-10 am. Models indicate high level clouds moving into the SJV around 1 pm. NWS forecaster forecasted patchy, thin cirrus entering the southern end of the valley around noon, followed by a thin cirrus layer. The cirrus are expected to be at ~30K ft.

PODEX coastal leg (Bay area) – Monterey NWS predicts stratus deck at least 50 miles off the coast tomorrow and minimal to no cirrus. The low level clouds are below ~1500 ft.

PODEX coastal leg (LA) – Oxnard NWS forecasted narrow patch of stratus within 50 miles of the coast, but the main lower level cloud deck would be out past 125+ miles off the coast. Models and forecaster predict high level clouds moving into the PODEX LA region by 10 am. Note – Monterey forecaster thought that the low level cloud deck would be parallel to the coast, which forecasts more low level clouds near the LA region than the Oxnard office.
Saturday – SJV – Cloud deck lower, more ~15K ft. Cloud layer expected to be ~50% opacity.

Sunday – Models bringing in clouds at multiple levels

Rest of the week – The upper level trough is forecast to drop south Wed night, bringing the main trough through CA next Thursday. Both models currently show heaviest precipitation over the northern SJV on Thursday although uncertainty is an issue that far out. Prior to the event, high level clouds are expected Mon, Tue, and Wed and fog issues should be minimal.
DISCOVER-AQ / PODEX
Forecast Briefing

January 31, 2013

Melanie Follette-Cook
Bryan Duncan
<table>
<thead>
<tr>
<th>Location</th>
<th>Today</th>
<th>Tonight</th>
<th>Friday</th>
<th>Friday Night</th>
<th>Saturday</th>
<th>Saturday Night</th>
<th>Sunday</th>
<th>Sunday Night</th>
<th>Monday</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fresno</td>
<td>Areas Fog High: 63 °F</td>
<td>Areas Fog Low: 42 °F</td>
<td>Areas Fog High: 66 °F</td>
<td>Areas Fog Low: 45 °F</td>
<td>Areas Fog High: 67 °F</td>
<td>Areas Fog Low: 46 °F</td>
<td>Areas Fog High: 64 °F</td>
<td>Partly Cloudy Low: 46 °F</td>
<td>Mostly Sunny High: 65 °F</td>
</tr>
<tr>
<td>Bakersfield</td>
<td>Sunny High: 63 °F</td>
<td>Clear Low: 41 °F</td>
<td>Sunny High: 67 °F</td>
<td>Mostly Clear Low: 43 °F</td>
<td>Mostly Sunny High: 68 °F</td>
<td>Mostly Sunny Low: 46 °F</td>
<td>Partly Cloudy High: 64 °F</td>
<td>Partly Cloudy Low: 45 °F</td>
<td>Mostly Sunny High: 65 °F</td>
</tr>
<tr>
<td>Palmdale</td>
<td>Sunny High: 68 °F</td>
<td>Clear Low: 42 °F</td>
<td>Sunny High: 66 °F</td>
<td>Mostly Clear Low: 44 °F</td>
<td>Mostly Sunny High: 65 °F</td>
<td>Mostly Sunny Low: 45 °F</td>
<td>Partly Cloudy High: 64 °F</td>
<td>Partly Cloudy Low: 42 °F</td>
<td>Mostly Sunny High: 64 °F</td>
</tr>
</tbody>
</table>
### Yuba City

<table>
<thead>
<tr>
<th>Day</th>
<th>Weather</th>
<th>High</th>
<th>Low</th>
</tr>
</thead>
<tbody>
<tr>
<td>Today</td>
<td>Sunny</td>
<td>62°F</td>
<td>35°F</td>
</tr>
<tr>
<td>Tonight</td>
<td>Clear</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Friday</td>
<td>Sunny</td>
<td>62°F</td>
<td>37°F</td>
</tr>
<tr>
<td>Friday Night</td>
<td>Mostly Clear</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Saturday</td>
<td>Sunny</td>
<td>63°F</td>
<td>40°F</td>
</tr>
<tr>
<td>Saturday Night</td>
<td>Partly Cloudy</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sunday</td>
<td>Mostly Sunny</td>
<td>64°F</td>
<td>39°F</td>
</tr>
<tr>
<td>Sunday Night</td>
<td>Partly Cloudy</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Monday</td>
<td>Mostly Sunny</td>
<td>62°F</td>
<td></td>
</tr>
</tbody>
</table>

### Sacramento

<table>
<thead>
<tr>
<th>Day</th>
<th>Weather</th>
<th>High</th>
<th>Low</th>
</tr>
</thead>
<tbody>
<tr>
<td>Today</td>
<td>Patchy Fog</td>
<td>63°F</td>
<td>37°F</td>
</tr>
<tr>
<td>Tonight</td>
<td>Patchy Fog</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Friday</td>
<td>Patchy Fog</td>
<td>63°F</td>
<td>38°F</td>
</tr>
<tr>
<td>Friday Night</td>
<td>Patchy Fog</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Saturday</td>
<td>Patchy Fog</td>
<td>63°F</td>
<td>41°F</td>
</tr>
<tr>
<td>Saturday Night</td>
<td>Partly Cloudy</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sunday</td>
<td>Mostly Sunny</td>
<td>63°F</td>
<td>40°F</td>
</tr>
<tr>
<td>Sunday Night</td>
<td>Partly Cloudy</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Monday</td>
<td>Mostly Sunny</td>
<td>63°F</td>
<td></td>
</tr>
</tbody>
</table>
Current Conditions

**FRESNO CA**
- Fair

**41°F**
- 5°C

- Humidity: 87%
- Wind Speed: calm
- Barometer: 30.28 in (1025.4 mb)
- Dewpoint: 37°F (3°C)
- Visibility: 7.00 mi

Last Update on 31 Jan 6:53 am PST

**HANFORD CA**
- Fog

**36°F**
- 2°C

- Humidity: 93%
- Wind Speed: calm
- Barometer: 30.29 in
- Dewpoint: 34°F (1°C)
- Visibility: 1.00 mi

Last Update on 31 Jan 7:30 am PST

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**Plymouth State Weather Center**

**Meteogram for KFAT from 1500Z 30 JAN 13 to 1500Z 31 JAN 13**

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**Plymouth State Weather Center**

**Meteogram for KHJO from 1500Z 30 JAN 13 to 1500Z 31 JAN 13**
GOES: IR at 1400 UTC Today

Cirrus may make it into Sacramento and Lake Tahoe areas today.

Likely low-level stratus under ridge today. (Strat Cu after trough passage typically.) ~100 mi offshore today. No cirrus.

No cirrus over SJV today.
GOES: Cloud Top Height at 1500 UTC Today
Today:
Central CA still under influence of an upper level ridge over the East Pacific.
Tomorrow (Friday):
Ridge moves over CA
Yuba City (Northern extent of Bay area leg)
Today: Sunny
Friday: Clear skies, light winds, RH > 95% – morning fog likely
Sacramento
Today: Sunny
Friday: Clear skies, light winds – morning fog possible
Fresno

Today: Sunny

Friday: Clear skies, light winds – morning fog possible. Clouds increasing slightly as the day progresses.
Hanford
Today: Sunny
Friday: Clear skies, light winds – morning fog possible. Clouds increasing slightly as the day progresses.
Bakersfield

Today: Sunny

Friday: Clear skies, light winds – morning fog possible. Clouds increasing slightly as the day progresses.
Palmdale
Today: Sunny
Friday: Sunny, light winds forecasted
GEOS-5: Friday 18Z = 10 PST

NASA/GMAO - GEOS-5 Forecast Initialized on 00z 2013-01-31
70 hPa Wind Speed [knots] and Heights [dam]

42 hr forecast valid Fri 18z 2013-02-01
Saturday:
The upper level trough upwind of the ridge is forecast to elongate
Sunday:
The upper level trough splits. The northern wave weakens the ridge and the southern portion closes off and forms a cutoff low.
Fresno
Saturday: Increasing cloud cover (< 50%)
Sunday: Increasing cloud cover (< 50%)
Hanford

Saturday: Increasing cloud cover (< 50%)
Sunday: Increasing cloud cover (< 50%)
Bakersfield
Saturday: Increasing cloud cover (< 50%)
Sunday: Increasing cloud cover (> 50%)

Saturday →

Wind Chill (°F)  Dewpoint (°F)  Temperature (°F)

Gusts (kt)  Wind (kt)

Rel. Humidity (%)  Pcpn. Potential (%)  Sky Cover (%)
Sacramento: BUFKIT NAM 12 UTC Thursday Jan. 31

- **Sunday:**
  - Clouds > 20 Kft
  - Clouds moving in above 25 Kft

- **Saturday:**
  - Clouds > 20 Kft
  - Clouds moving in above 25 Kft

- **Friday:**
  - PBL Height

- **Today:**
  - Clouds
Fresno : BUFKIT NAM 12 UTC Thursday Jan. 31

Sunday: Clouds > 10 Kft
Saturday: Clouds deck from 25 Kft down to 10 Kft later in day
Friday: PBL Height
Today: Clouds

Clouds deck from 25 Kft down to 10 Kft later in day.
Bakersfield: BUFKIT NAM 12 UTC Thursday Jan. 31

Sunday | Saturday | Friday | Today

Clouds < 10 Kft

Clouds

PBL Height
<table>
<thead>
<tr>
<th>Day</th>
<th>Clouds</th>
<th>PBL Height</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sunday</td>
<td>Clouds ~ 10 Kft</td>
<td></td>
</tr>
<tr>
<td>Saturday</td>
<td>Clouds ~ 10 Kft</td>
<td></td>
</tr>
<tr>
<td>Friday</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Today</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Monday:
Weakened ridge remains over our area. Upper level low enters the Gulf of Alaska
Tuesday - Thursday:
Short wave around the low moves into the Pacific NW. The GFS and ECMWF don’t show much precipitation associated with this disturbance.
The low is forecast to drop south Wed night, bringing the main trough through CA next Thursday. Both models currently show heaviest precipitation over the northern SJV on Thursday although uncertainty is an issue that far out.
GFS - 250 mb winds - Extended forecast

GFS - 500 mb vorticity - Extended forecast
Fresno

Monday: Increased cloud cover (< 50%)
Tuesday: Increased cloud cover (> 50%)
Hanfords

Monday: Increased cloud cover (< 50%)
Tuesday: Increased cloud cover (> 50%)
Bakersfield

Monday: Increased cloud cover (< 50%)
Tuesday: Increased cloud cover (< 50%)
Tomorrow: NAM – High level clouds over PODEX LA region by 10 am, over the SJV around 1 pm. NAM forecasting low level clouds near PODEX coastal legs.
Tomorrow: GEOS5 – Morning fog in the SJV, low level clouds far off coast. High level clouds over the PODEX region all day approaching the SJV region by 1 pm.
Tomorrow: Canadian – looks like thin, high clouds approaching from the south. Over PODEX region by 10 am and SJV by 1 pm; GFS – Same as Canadian model.
Saturday: NAM – High level clouds all day

Intended liquid and frozen hydrometeors (all levels)

51-hour forecast valid 1500 UTC Sat 02 Feb 2013

7 am

10 am

1 pm

4 pm
Saturday: GEOS5 – high level clouds all day, mid level clouds over PODEX region, approaching the SJV by 10 am.
Saturday: GFS – high level cloud cover over entire region

10 am

4 pm

GFS Total Cloud

GFS Low level

GFS High level
Sunday: NAM – Clouds from 6 Kft and high forecast for the SJV and PODEX LA region all day.
Sunday: GEOS5 – Clouds at all levels throughout the day

7 am
GEOS5 – Low level

10 am
GEOS5 – Mid level

1 pm
GEOS5 – High level

4 pm
SJV APCD Daily Forecast – for TODAY (Jan 31)

**ROAR LEVEL** | **Ozone (O³)** | **Particulate Matter (PM 2.5)**
---|---|---
**LEVEL 1** Good | 1-59 ppb | 1-15 µg/m³
**LEVEL 2** Moderate | 60-75 ppb | 16-35 µg/m³
**LEVEL 3** Unhealthy for Sensitive Groups | 76-95 ppb | 36-55 µg/m³
**LEVEL 4** Unhealthy | 96-115 ppb | 56-75 µg/m³
**LEVEL 5** Very Unhealthy | >115 ppb | >75 µg/m³
Air Quality Forecast

Today's High

<table>
<thead>
<tr>
<th>Air Quality Index (AQI)</th>
<th>Today's High</th>
</tr>
</thead>
<tbody>
<tr>
<td>Moderate</td>
<td>87</td>
</tr>
</tbody>
</table>

Health Message: Unusually sensitive people should consider reducing prolonged or heavy exertion.

Tomorrow's High

<table>
<thead>
<tr>
<th>Air Quality Index (AQI)</th>
<th>Tomorrow's High</th>
</tr>
</thead>
<tbody>
<tr>
<td>Moderate</td>
<td>92</td>
</tr>
</tbody>
</table>

Health Message: Unusually sensitive people should consider reducing prolonged or heavy exertion.

Aqi - Pollutant Details

<table>
<thead>
<tr>
<th>Particles (PM2.5)</th>
<th>Today</th>
<th>tomorrow</th>
</tr>
</thead>
<tbody>
<tr>
<td>Moderate</td>
<td>87</td>
<td>82</td>
</tr>
</tbody>
</table>

Forecast Discussion: Wednesday through Friday, an upper-level ridge of high pressure will build over northern California, reducing vertical mixing in the atmosphere. In addition, light winds will limit pollutant dispersion in the Sacramento region. Therefore, particle levels will be Moderate on all three days.

Current Conditions

Air Quality Index (AQI)

100 Moderate

observed at 6:00 PM

5 Day Forecast

Air Quality Forecast

Wednesday, January 30 at 10:43 AM

<table>
<thead>
<tr>
<th></th>
<th>Wed</th>
<th>Thu</th>
<th>Fri</th>
<th>Sat</th>
<th>Sun</th>
</tr>
</thead>
<tbody>
<tr>
<td>North Counties</td>
<td>60</td>
<td>67</td>
<td>M</td>
<td>M</td>
<td>M</td>
</tr>
<tr>
<td>Coast and Central Bay</td>
<td>49</td>
<td>49</td>
<td>M</td>
<td>M</td>
<td>M</td>
</tr>
<tr>
<td>Eastern District</td>
<td>45</td>
<td>49</td>
<td>M</td>
<td>M</td>
<td>M</td>
</tr>
<tr>
<td>South Central Bay</td>
<td>42</td>
<td>45</td>
<td>G</td>
<td>M</td>
<td>M</td>
</tr>
<tr>
<td>Santa Clara Valley</td>
<td>52</td>
<td>52</td>
<td>M</td>
<td>M</td>
<td>M</td>
</tr>
</tbody>
</table>
January 30 (Wednesday) & 31\textsuperscript{th} (Today)

Fresno-Garland

- Similar behavior as last two days.

Bakersfield

- PM2.5 on the rise!

Corcoran

- PM2.5 on the rise!

Stockton
Bakersfield to Fresno (South SJV)

Fresno should be code yellow today, though the last 3 nights have featured elevated PM2.5 (40-55 ug/m3). Could be due to an inversion, but SJV APCD forecaster unsure.

SJV:
Overall, PM2.5 levels should build by a couple ug/m3 each day for Wed.- Wed. – a sustained event.

    Friday should be the peak day. Traffic generally higher, which may contribute. Weekend levels should drop only slightly (~upper 20’s ug/m3). Levels should build into next week to mid-upper 30’s ug/m3 by Tues. and/or Wed. The SJV should be cleaned out by Thursday.

Fresno to Yuba City (North SJV)

The evolution of PM2.5 should be similar as in the south SJV. The north SJV is starting cleaner than the south SJV, so levels should stay a little lower there.
NOAA CMAQ: Friday 10 am = 18 Z

Pollution offshore
NOAA CMAQ: Friday 10 am = 18 Z

Pollution offshore
NOAA CMAQ:  Friday 10 am = 18 Z

CO [ppm] at 1013 [hPa] Valid 18 FEB 01 2013

SO2 [ppb] at 1013 [hPa] Valid 18 FEB 01 2013

FORM [ppb] at 1013 [hPa] Valid 18 FEB 01 2013
GMAO GEOS5: San Nicolas Is.
GMAO GEOS5: Ocean 40 N 130 W
GMAO GEOS5: Ocean 38 N 125 W
GMAO GEOS5: Ocean 30 N 130 W
Recommendations

Friday –
**SJV (PODEX/D-AQ)** – Fog in the morning a little more widespread than today, burning off by 9-10 am. Models indicate high level clouds moving into the SJV around 1 pm. NWS forecaster forecasted patchy, thin cirrus entering the southern end of the valley around noon, followed by a thin cirrus layer. The cirrus are expected to be at ~30K ft.

**PODEX coastal leg (Bay area)** – Monterey NWS predicts stratus deck at least 50 miles off the coast tomorrow and minimal to no cirrus. The low level clouds are below ~1500 ft.

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Note – Monterey forecaster thought that the low level cloud deck would be parallel to the coast, which forecasts more low level clouds near the LA region than the Oxnard office.
Recommendations

Saturday – SJV – Cloud deck lower, more ~15K ft. Cloud layer expected to be ~50% opacity.

Sunday – Models bringing in clouds at multiple levels

Rest of the week – The upper level trough is forecast to drop south Wed night, bringing the main trough through CA next Thursday. Both models currently show heaviest precipitation over the northern SJV on Thursday although uncertainty is an issue that far out. Prior to the event, high level clouds are expected Mon, Tue, and Wed and fog issues should be minimal.