

CalNex Forecast Notes - Thursday, May 13, 2010

California Synoptic Overview - Jason Branz (jbranz@arb.ca.gov)

Thursday May 13

- Weak trough moving east with N/NW transport flow
- Weak onshore flow on the coast
- Slope-driven flow in the valleys

Friday May 14

- Little change from Thursday with ridging in place
- Light transport flow expected
- Increasing marine inversion south of Pt Conception

Saturday May 15

- Ridge axis moves east, trough digs southward offshore
- Onshore flow increases in the north
- Onshore flow with coastal stratus in the south

Sunday May 16

- W/SW transport flow increases as Pac trof nears
- Surface onshore flow increases N and S
- Marine layer increases
- Precip (if any) holds off until Monday north of Bay Area

Anticipated activity for P3

Thu: No Flight

Fri: ship plume investigation, SoCAB

Sat: No Flight

Sun: Flight

Local Features:

Increasing stratus Friday compared to Thursday. Friday ship plume experiment off San Nicolaus Island would likely encounter increasing stratus Friday compared to Thursday. Terrain induced clearing expected in the lee of Pt.

Conception/Santa Ynez Mountains, smaller area in am, with increasing extent in pm, but less areal extent than observed on Thursday. Modest clearing in lee of Channel Islands.

Large Scale Transport Notes - Brad Pierce (brad.pierce@noaa.gov))

LA /SF AIRNOW Site Comparison

Predicting Moderate O3/PM2.5 LA AQ during FX period

Good O3 and Good/Moderate PM2.5 SF AQ during FX period

RAQMS likely underpredicting LA O3 P-L during later part of FX period

LA/SF AIRNOW Ensemble

Intermediate (24hr) LA transport route to southeast during FX period. Stagnation over western AZ for ensemble ending Sat. Advection into NV for ensemble ending Sun.

SF Ensemble shows rapid southward transport to Baja for ensembles ending Fri. Stagnation over Southern CA /AZ boarder for ensemble ending Sat/Sun.

500m RDF FX 00Z 05/14 (Thu Afternoon)

Clean intercontinental air off shore. Advection of SF pollution to the South at 500m. Eastern CA under influence of CONUS airmass

Moderate (5-10 ppbv/day) background O3 P-L offshore of LA and south of SF

500m RDF FX 00Z 05/15 (Fri Afternoon)

Intercontinental CO enhancement offshore, advection of SF pollution South and LA pollution to the East at 500m.

Lagrangian mean descent off the Southern CA coast likely to strengthen MBL inversion

Moderate (5-10 ppbv/day) background O3 P-L East of LA and South of SF

CONUS PBL air advected southward off MX coast

500m RDF FX 00Z 05/16 (Sat Afternoon)

Intercontinental CO enhancement remaining offshore, advection of SF and LA pollution to the East at 500m

Moderate (5-10 ppbv/day) background O3 P-L East of LA&SF

CONUS PBL air advected southward off MX coast

500m RDF FX 00Z 05/17 (Sun Afternoon)

Intercontinental CO enhancement moving onshore, advection of SF and LA pollution to the North East at 500m

Elevated (10-15 ppbv/day) background O3 P-L NE of LA&SF

CONUS PBL air advected southward off MX coast. Marine PBL influence dominating CA

Forecast Details

San Francisco Bay Area - Danny Kam (dkam@airquality.org)

Note: smaller red font in parenthesis e.g., (10kt) indicates prediction from previous forecast which differs from the forecast today

Thursday

- Generally NW 15 kt, briefly lightens in late morning, and resumes strength in the afternoon
- MBL 500 ft

Friday

- 10 to 15 kt NW wind
- GFS/MM5: Lack of pressure gradient from northern state to have northerly flow, hence onshore through the delta into SV and SJV, splitting 40/60 respectively

Saturday

- NW 10 to 15 kt wind
- Onshore flow toward SV and SJV, 50/50 bifurcation
- MBL 500ft;

Sunday

- NW 10kt becoming lighter and shifting W
- Onshore flow continues, decrease overnight

Monday & Tuesday

- W 5kt wind shifting S, onshore flow dies down; light S wind shifting W in the afternoon, shifting N overnight

Sacramento Valley - Danny Kam (dkam@airquality.org)

Note:

smaller red font in parenthesis e.g., (subsiding N wind limit downslope flow to eastern SV) indicates prediction from previous forecast which differs from the forecast today

Thursday

- Light N to E wind in the morning, NW 5 kt after sunrise (to 10kt, less than 5 kts in the afternoon), light variable and calm after sunset
- Moderate PM downslope flow reaching SV (E wind for northern SV)
- Light onshore flow at late evening (SW wind for southern SV)
- PM PBL between 4,500 ft to 6,000 ft, higher for southern SV

Friday

- Light E wind (northern SV) and light SW wind (southern SV); light S to light W after sunrise; light wind turning E for northern SV
- Onshore flow with light PM downslope flow
- Strong shallow inversion, AM PBL less than 1,000 ft, PM PBL 4,000 ft

Saturday

- Light E (northern SV) and S (southern SV); 5kt S to W wind after sunrise
- Onshore throughout the day, limited downslope flow reaching SV
- AM PBL 500 ft; PM PBL 5,000 ft

- Peak O3 day for this forecast period Sunday
- S to W 5kt; onshore flow all day; PBL around 4,000 ft

Monday & Tuesday

- SW 5kt; downslope flow resumes Monday PM; W on Tuesday

San Joaquin Valley - Shawn Ferreria (shawn.ferreria@valleyair.org)

Thursday May 13

Surface Winds: The surface observations this morning show calm to light SE wind flow throughout the SJV from Merced County southward. The lower air profilers in Lost Hills, Visalia, and Chowchilla are showing light and variable wind flow up to 3,000 feet, strengthening from the south to southeast above. The Tracy lower air profiler is depicting light north to northwesterly winds throughout. CANSAC model shows light and variable wind flow throughout the SJV through 10 PDT. With heating an very weak onshore flow will develop through the Delta, Altamont, Cottonwood and Pacheco Passes during the afternoon hours. Northwesterly winds are forecast to be stronger over Kern and Tulare counties later today. Weak outflow via the Tejon and Tehachapi passes in the south Valley from midday through the evening. Typical, upslope and downslope flow will be present over the mountainous parts of the District through the entire forecast period. Onshore flow will strengthen overnight and penetrate further into the SJV (San Joaquin, Merced, and Stanislaus Counties).

Boundary Layer Mixing: The morning aircraft soundings depict between 6 to 8 degrees Fahrenheit inversion between the surface and 500 to 1,000 feet. The atmosphere is warmer today compared to yesterday showing an increase influence of the high pressure off the Coast. Maximum mixing depths will range from 4,500 to 6,000 feet along the central and eastern parts of the District, with a ribbon of lower maximum mixing heights residing along the west side (1,750 to 2,500 feet).

Air Quality: Air quality will be in the good AQI in San Joaquin and Stanislaus Counties. Moderate air quality is predict elsewhere in SJV.

Friday May 14

Surface Winds: CANSAC shows stronger onshore flow developing tomorrow through the passes, with light to moderate northwesterly winds predicted in Merced county northward. Light to variable northwesterly flow is predicted for the rest of the SJV. Under strengthening high pressure, wind flow will be light

and variable throughout the SJV. Weak outflow is forecast toward SLO and Deserts.

Boundary Layer Mixing: Stronger mixing will occur on Friday, with maximum mixing depths between 5,500 and 8,000 feet along the central and eastern parts of the SJV. Lower mixing depths will occur in Kings, western Kern and Fresno Counties.

Air Quality: Deteriorating air quality conditions...however, will remain in the moderate AQI range for most of the District tomorrow..

Saturday May 15

Surface Winds: Overnight winds will be light to moderate northwesterly winds throughout the entire SJV. Winds will be stronger across San Joaquin, Stanislaus, and Merced Counties. Moderate onshore flow will occur near the Delta, Altamont, and Pacheco passes, with outflow toward the Deserts (Tehachapi and Tejon pass).

Boundary Layer Mixing: CANSAC shows maximum boundary layer mixing depths lower compared to Friday (between 3,500 and 5,500 feet).

Air Quality: Forecast to be moderate in Stanislaus, Kings, Tulare, Fresno, and Merced Counties. Potential for USG in Kern County.

Sunday May 16 and Monday May 17

Surface Winds: On Sunday, Surface wind flow will be predominately thermally driven, with light southeasterly winds during the morning hours, becoming northwest during the afternoon. As a trough begins to approach California on Sunday, onshore (Delta and Altamont flow) will occur later in the day. Winds will steadily strengthen from the northwest across the northern parts of the SJV. This pattern is predicted to continue into Monday.

Boundary Layer Mixing: Maximum mixing depths will remain between 3,500 to 4,500 feet through the period. By Monday the mixing depths will increase across the northern parts of the SJV.

Air Quality: Air Quality will be moderate range across the District, with the potential for USG in Kern County on Sunday. Conditions will improve on Monday under increasing dispersion conditions.

Potential Targets for next Flight Day

Analyze the flow exchanges between SFBA, SAC and SJV.

Central Coast - Gary Arcemont (garcemont@co.slo.ca.us)

5/13/2010 - 9 am PST

Yesterday 5/12: NW flow coast. Interior ridges NNE flow early – W in PM. Blowing dust Nipomo Mesa with Moderate air quality - PM10. Good air quality elsewhere.

Current Wx: Stratus along central coast, coastal plains, Salinas Valley & over the top of Pacheco Pass. Marine layer at Ft Ord ~ 2000ft deep Lost Hills sfc inv 6C to 1000 ft AGL

Synopsis: Fair Wx. - Night and morning low clouds along coast with hazy afternoon sun and mostly clear inland, with stratus into valleys early morning.

Today Thursday 5/13/2010: Trough Great Basin. Flow aloft becomes NE. Stratus clearing away from coast PM.

Friday: Trough over Great Basin. Flow aloft NE in AM, W in PM. Stratus night and morning coastal plain and offshore, clear inland. Easterly flow allows ozone/precursor transport to interior ridges.

Saturday: Weak ridge. SE flow aloft. Stratus night and morning coastal plain and offshore, clear inland. Easterly flow allows ozone/precursor transport to interior ridges.

Sunday: Approaching trough E Pac. Stratus night and morning coastal plain and offshore, clear inland.

Monday: Trough axis over CA. Stratus night and morning coastal plain and offshore, clear inland.

Tuesday: Weak ridge

Air quality: Good air quality Thursday. Increasing ozone, deteriorating dispersion Friday & over the weekend, moderate air quality interior ridges/valleys due to increasing ozone/precursor transport.

Significant features for study: Increasing ozone interior valleys/ridges of Temblor & Diablo Ranges Friday- Sunday

SoCal Coastal Waters - Lee Eddington (Lee.Eddington@navy.mil)

** NOTE ** NOGAPS (COAMPS forcing) did not verify as well for synoptic features today compared to GFS (assumed CANSAC/NOAA WRF/NMC WRF forcing) and (likely as a result of NOGAPS forcing) for current forecast COAMPS is overestimating offshore flow. Therefore current notes on clouds and winds are based more on CANSAC and WRF/NMC results.

+ Thursday afternoon (00Z 14 May)

- Marine Low Clouds

- * SCT/BKN St Crescent City to Cape Mendocino
- * BKN/OVC St Cape Mendocino to Point Arguello
- * CLR Point Arguello to Palos Verdes
- * SCT/BKN St Palos Verdes to San Diego

- SOCAL Marine Layer Winds

- * W 5-10 kts inner waters
- * NW 10-15 kts outer waters

+ Friday morning (12Z 14 May)

- Marine Low Clouds

- * SCT/BKN St Crescent City to San Francisco
- * BKN/OVC St San Francisco to Point Arguello
- * CLR/SCT St Point Arguello to Santa Barbara
- * BKN/OVC St Santa Barbara to San Diego

- SOCAL Marine Layer Winds

- * LT VAR inner waters
- * NW 10-20 kts outer waters

+ Friday afternoon (00Z 15 May)

- Marine Low Clouds

- * BKN/OVC St Crescent City to Point Arguello
- * CLR Point Arguello to Point Mugu
- * BKN/OVC St Point Mugu to San Diego

- SOCAL Marine Layer Winds

- * W 8-12 kts inner waters except 3-7 kts off San Diego County

- * WNW 10-15 kts outer waters

+ Saturday morning (12Z 15 May)

- Marine Low Clouds

- * BKN/OVC St Crescent City to Point Arguello

- * CLR/SCT St Point Arguello to Santa Barbara

- * BKN/OVC St Santa Barbara to San Diego

- SOCAL Marine Layer Winds

- * LT VAR inner waters

- * NW 10-20 kts outer waters

+ Saturday afternoon (00Z 16 May)

- Marine Low Clouds

- * CLR Crescent City to San Francisco

- * BKN/OVC St San Francisco to Point Arguello

- * CLR/SCT St Point Arguello to San Diego

- SOCAL Marine Layer Winds

- * W 8-12 kts inner waters

- * WNW 10-20 kts outer waters

- + Sunday morning (12Z 16 May)

- Marine Low Clouds

- * BKN/OVC St Crescent City to Point Arguello

- * CLR/SCT St Point Arguello to Santa Barbara

- * BKN/OVC St Santa Barbara to San Diego

- SOCAL Marine Layer Winds

- * LT VAR inner waters

- * NW 10-15 kts outer waters

- + Sunday afternoon (00Z 17 May)

- Marine Low Clouds

* BKN/OVC St Crescent City to Point Arguello

* CLR Point Arguello to Palos Verdes

* BKN/OVC St Palos Verdes to San Diego

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South Coast - Kevin Durkee (kdurkee@aqmd.gov)

- Thursday: weak trough moves through; weak coastal eddy in bight; onshore AM flow from S & SE along coast; patchy marine layer in the morning; sea breeze in afternoon; warmer (temperatures near normal); partly cloudy in afternoon with more high clouds; ozone mostly moderate but USG possible in a couple of areas (inland, with afternoon sea breeze)
- Friday: weak ridge begins to build aloft off west coast; warmer; stronger inversion; marine layer starts to reform - coastal eddy possible off coast; some AM stratus to coast and maybe coastal valleys; mostly Moderate, but USG ozone possible
- Saturday: more weak ridging aloft; ~ warmest day this week - to mid 80s inland valleys (slightly above normal temps); stronger onshore flow; stronger inversion & marine layer - more inland intrusion of AM stratus; sunny afternoon; USG ozone likely inland
- Sunday: similar to Saturday; weak trough begins to approach to north, weak ridging over So Calif.; still slightly above normal temperatures inland; USG ozone likely inland
- Monday: weak trough approaches for minor cooling and possibly more gusty winds