

CalNex Forecast Notes - Wednesday, May 12, 2010

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

Wednesday May 12

- Trough now in the Great Basin
- Transport remains N/NW and weakens
- Onshore flow increases by late afternoon N and S

Thursday May 13

- Weak trough remains with N/NW transport flow
- Surface flow remains weak onshore on the coast, slope-driven in the valleys
- Marine layer/coastal stratus possible for LA basin

Friday May 14

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

Saturday-Sunday May 15-16

- Trough digs southward offshore Saturday
- Onshore flow increases in the north Sat/Sun
- Onshore flow with coastal stratus in the south Sat/Sun
- Chance of precip late Sunday north of the Bay Area

Anticipated Activities

Anticipated activity for P3

Tues: Sacramento Valley, delta

Wed: Northern San Joaquin Valley, SFBA, clouds Monterey

Thu: No Flight

Fri: ship plume investigation, SoCAB

Sat: No Flight

Sun: Flight

Anticipated activities:

Ozonesondes - ~3pm releases daily except Sunday

NASA King Air - arrives Wed/Thu

R/V Atlantis - operations on Fri

NOAA Twin Otter - arrives Sat

Local Features:

Wed: SJV - spatial differences in modeled mixing heights, lower on W side. Do the models (slides 29, 30) get this right? Inflow through Altamont and delta to SJV

Fri: early forecast has some stratus for ship plume experiment, see notes on slide 42 about divergent model predictions.

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

LA/SF AIRNOW Site Comparison

Good/Moderate O3/PM2.5 AQ for LA during FX period

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

LA/SF AIRNOW Ensemble

Intermediate (24hr) transport route of LA Ensemble to east then southeast during FX period. Stagnation over CA/MX and western AZ for ensemble ending Fri/Sat

SF Ensemble shows dispersion towards southeast for ensemble ending Thur. Rapid southward transport to Baja for ensembles ending Fri. Stagnation over Southern CA for ensemble ending Sat.

500m RDF FX 00Z 05/13 (Wen Afternoon)

Clean Intercontinental air offshore. SF plume advected south. CONUS airmass advected southwest over South and Central CA

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

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

Intercontinental pollution off shore. Advection of SF and LA pollution to the South at 500m. CA under influence of CONUS airmass

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

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

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

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

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

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

Wednesday

- NW 20 kt becoming 10 to 15 kt by noon; resumes NW 20 kt at night
- North wind from SV reaching SF bay in the morning, briefly becomes offshore
- Onshore flow at night primarily into SJV, decrease as downslope flow develops'
- MBL 500 ft in the afternoon

Thursday

- Generally NW 15 kt, briefly becomes 10 kt at late morning and late evening
- N flow from SV reaching the coast
Light onshore flow
- MBL 500 ft

Friday

- 10 to 15 kt N 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 10kt wind, a bit stronger in the afternoon

Sunday & Monday

- NW 10kt wind, becoming lighter and turning SW overnight; SW wind becoming 20 kt; increasing onshore flow toward SV with SW wind

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

Wednesday

- N wind 5 to 10 kt for southeastern SV, 10 to 15 kt for northwestern SV; steady 10 kt in the afternoon; 5 kts in the evening
- Light PM downslope flow to valley; PM PBL 4,000 ft; areas along foothills 7,000 ft

Thursday

- Light N to E wind becoming N 5 to 10kt, less than 5 kts in the afternoon
- Strong PM downslope flow reaching the delta (valley)
- Trickle of onshore flow before downslope flow develops

- AM PBL below 500 ft with bubbles of 2,000 ft; PM PBL around 5,000 ft (3,000 ft)

Friday

- GFS/MM5: Light variable wind before sunrise, onshore flow (5 kt SW) through the delta by late morning, less than 5 kt and becoming variable at night
- Moderate PM downslope flow
- Strong shallow inversion, AM PBL less than 1,000 ft, PM PBL 4,000 ft

Saturday

- Very light wind in the morning, onshore flow in the afternoon and evening
- Diurnal upslope/downslope, PM PBL 6,000 ft

Sunday & Monday

- Light southerly wind on Sunday becoming stronger; southerly wind on Monday; onshore flow for both days
Sun's 8 hr max O3 is expected to be 70s ppb, highest for this forecast period

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

Wednesday May 12

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 throughout the atmospheric profile. The Tracy lower air profiler is depicting light northwesterly winds throughout. CANSAC model shows light southeasterly winds from Merced county southward during the morning hours. With afternoon heating an onshore flow will develop through the Delta, Altamont, and Pacheco Pass. Surface northwesterly winds will be light to moderate in the northern, central, and western SJV. Wind flow is lighter in the southern SJV. Moderate 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.

Boundary Layer Mixing: No aircraft soundings were available this morning in Fresno and Bakersfield. Mixing should improve to 3,500 to 5,500 feet throughout most of the SJV. A ribbon of lower mixing heights resides along the west side (2,500 to 3,500 feet). **Interesting Feature to note.

Air Quality: Air quality will be in the good AQI range over most of the District today, with the exception of the valley portion of Kern, where ozone may move into the moderate range.

Thursday May 13

Surface Winds: CANSAC shows light and variable wind flow over the SJV tonight into early tomorrow morning, with very light inflow through the Delta into northern San Joaquin County. Under strengthening high pressure, wind flow will be light and variable

throughout the SJV. North to Northwesterly winds are forecast to increase in Kern County later in the day, with weak outflow toward SLO and Deserts.

Boundary Layer Mixing: Very limited mixing depths during the overnight hours. Maximum mixing depths will be between 3,000 to 5,000 feet. A wider swath of lower mixing depths will be present over the western part of the SJV.

Air Quality: Deteriorating air quality conditions will occur, with moderate AQI's forecast for Kern, Fresno, and Tulare counties.

Friday May 14

Surface Winds: Overnight winds will be light and variable over the entire SJV. Weak inflow will occur near the Delta into northern San Joaquin County. Surface winds will then be thermally driven, with light southeasterly flow during the morning hours, strengthening from the northwest during the afternoon.

Boundary Layer Mixing: CANSAC shows mixing similar to Thursday improving to near 5,000 feet over parts of the SJV.

Air Quality: Forecast to be moderate in Stanislaus, Kings, Tulare, Fresno, and Valley portion of Kern Counties. Elsewhere predicted to be good.

Saturday May 15 and Sunday May 16

Surface Winds: 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.

Boundary Layer Mixing: Maximum mixing depths will remain between 3,500 to 4,500 feet through the period.

Air Quality: Air Quality will be moderate range across the District, with the potential for USG in Kern County by Saturday and Sunday.

Potential Targets for next Flight Day

For Wednesday in the northern SJV, the flow into the Valley via the Delta and Altamont passes would be an interesting feature to capture (see next slide).

Also investigate the limited mixing over the western parts of the SJV that the CANSAC model is predicting.

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

Yesterday: Sprinkles & Light showers in San Luis Obispo at sundown. Strong NW flow. Good air quality.

Current Wx: Mostly clear along coast, Partly cloudy offshore, Clouds top the interior of coast range and north slopes of the Tehachapis, Mt Pinos and the Grapevine – W to SW flow interior ridgetops,
VBG weak elevated inversion base 1486m -1.3C Ft Ord weak sfc inversion 2 deg C to 200 ft.

Today: Inside slider. Mostly clear along coast. NW flow surface & aloft, stronger surface NW flow afternoon. Chance of snow flurries above 4000 feet – north slopes of the Grapevine, Mt Pinos, Tehachapis

Wednesday: Trough moving east. N flow aloft. Partly cloudy AM, clearing PM inland.

Thursday: Trough moving east. N flow aloft. Stratus AM coast, clear inland. Clearing away from coast PM

Friday: Baggy trough over Nevada. Less stratus, patchy coast, offshore.

Saturday: Weak ridge

Sunday: Weak ridge, approaching trough E Pac.

Air quality: Good air quality: Tuesday, Wednesday, Thursday. Increasing ozone, deteriorating dispersion over the weekend.

Suggested targets: Increasing ozone inland ridgetops, interior coast range Friday & weekend

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

+ Wednesday afternoon (00Z 13 May)

- Marine Low Clouds

* Mostly CLR/SCT St/StCu Crescent City to Point Arguello

* CLR Point Arguello to San Diego

- SOCAL Marine Layer Winds

* W 10-15 kts inner waters

* NW 10-20 kts outer waters

+ Thursday morning (12Z 13 May)

- Marine Low Clouds
 - * SCT St Crescent City to Point Arguello
 - * CLR Point Arguello to Palos Verdes
 - * SCT/BKN St/fog Palos Verdes to San Diego

- SOCAL Marine Layer Winds
 - * ESE 0-10 kts inner waters
 - * NW 10-20 kts outer waters

+ Thursday afternoon (00Z 14 May)

- Marine Low Clouds
 - * SCT St Crescent City to Point Arguello
 - * CLR Point Arguello 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/fog Crescent City to Point Arguello
 - * CLR Point Arguello to Palos Verdes
 - * SCT/BKN St/fog Palos Verdes to San Diego

- SOCAL Marine Layer Winds
 - * E 0-10 kts inner waters
 - * NNW 5-10 kts outer waters

+ Friday afternoon (00Z 15 May)

** NOTE ** NOGAPS (COAMPS forcing) and GFS (assumed CANSAC/NOAA WRF/NMC WRF forcing) treat weak upper-level trough over SOCAL differently. NOGAPS has the trough forming a cut-off low over SOCAL producing easterly flow, while GFS has an open trough with WNW flow aloft. It appears these differences are causing the mesoscale models to have substantial differences in low cloud and low level wind forecasts with COAMPS producing more offshore flow and less clouds than the other

models. Hoping that tomorrow the large-scale models show more agreement and we have a forecast that is less divergent.

- Marine Low Clouds

- * SCT St/fog Crescent City to Cape Mendicino
- * CLR Cape Mendicino to San Diego

- SOCAL Marine Layer Winds

- * W 5-10 kts inner waters
- * WNW 5-10 kts outer waters

+ Saturday morning (12Z 15 May)

- Marine Low Clouds

- * SCT/BKN St/fog Crescent City to San Diego

- SOCAL Marine Layer Winds

- * E 0-5 kts inner waters
- * W 5-10 kts outer waters

+ Saturday afternoon (00Z 16 May)

- Marine Low Clouds

- * Mostly CLR/SCT St/fog Crescent City to Point Conception
- * SCT/BKN St Point Conception to San Diego

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

- Wednesday: upper low moves out of Nevada; heights/thickness rise quickly aloft, but weak troughing remains; little or no inversion; afternoon mixing to 4800 feet; lighter winds - weaker onshore flow (below WAD level); sunny and warmer (4-8 deg F increases in Basin); increasing ozone, into moderate range
- Thursday: weak trough moves through; coastal eddy possible in bight; onshore AM flow; 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

Northern California

Observed, Model-Interpolated Winds for SF Bay
<http://sfports.wr.usgs.gov/cgi-bin/wind/windbin.cgi>

and

COAMPS Wind Plots
<http://www.sccoos.org/data/coamps/coamps.html>