

Debris Flow-2007/2008 Event Log

IOP-6

Lat: 33.94933 N Lon: -118.44217 W Alt: 43 m Truck HD: 100 deg
 Date/Time SR1 ready for operation: 24 January 2008 1805 UTC

Note taker: JJ Gourley (NSSL) and Ken Howard (NSSL)

Time (UTC)	Event
1805	JJ arrived on site, leveled truck and got all systems up OK
1826	Began data collection. Convective rainfall near radar site out over ocean. Light to moderate showers over the burn areas.
1852	Convective activity has moved inland and remains E-NE of burn areas. Some cells had reflectivity values ~ 45 dBZ.
1906	While there is a current lull in the shower activity over the burn areas, storms are developing out over the ocean in the unstable air upstream of the basin. Also, regional satellite and radar loops show significant band of rain moving inland. Should arrive in a couple hours.
2003	Storms developed very quickly on S-facing slope just to the W of burn area. Suspect this activity will continue to propagate E-ward in next hour, thus impacting burn areas.
2058	Showers have begun to intensify, especially over land, with some values exceeding 45 dBZ. Storms are just now entering the burn areas from the S. While they are scattered, they seem to be lined in a N-S corridor so that several storms will continue to impact basin. Have found the loops on the internet to be at least as good if not better for observing weather than the iris real-time display.
2107	Eastern basin getting impact from storm with reflectivity near 40 dBZ. Difficult to distinguish real echoes from ground clutter up to 3.1 deg. Suspect this will be a challenge in terms of data quality for good QPE.
2137	Burn areas just received a 1-2-3 shot from moderate rain showers. A large cell has formed out over the ocean and has its sites set on the burn areas. Storm area is increasing and max reflectivity is ~ 30 dBZ.
2151	Aforementioned storm continues to grow in area and intensity as it approaches burn area. Can see very well developed rain shaft out over ocean with rain-free base as well. Will also keep an eye on velocity signatures with this storm. Quick glance indicates some aliasing is occurring at edges of storm.
2215	Storm has weakened a little and become more clustered. Will be interesting to see if terrain leads to reflectivity increases as storms moves onshore.
2247	Very strong core has developed on backside of storm with reflectivity values > 55 dBZ. Also, a closer inspection of velocity may show a couplet has formed indicating rotation. Most intense part of this cell will likely make landfall to the W of burn areas.
2258	Ken arrived and called Oxnard forecast office notifying them (Eric) that storm making landfall had velocity signature worth noting. No warning has been issued with storm.

2317	Light rain at the radar. E-W band of moderate rainfall moving through burn areas.
2325	E-W band of moderate rainfall rapidly moving NE through burn areas.
2340	Band northeast of burn areas with no additional development south. Activity continues to increase in coverage west.
2345	Gusty winds at radar. SC increased significantly behind E-W band
0016	Gauge Rainfall from previous e-w band >.2 from LADPW. Circle X Ranch .24 in hour ending at 00 UTC
0020	No additional development south but a new intense cell SW of Pt Dume. SC very impressive
0035	Intense cell moving inland with nearly the same track as before (see 2247) – no warnings issued –
0042	Persistent W-E orography forced stratiform 25-30 dBz reflectivity band extending over burn areas and then east.. Visually base above mountain tops with no obvious precip.
0100	Series of NW to SE precip bands developing 30-40km SW
0110	BB forming
0120	Initial NW to SE band inserting coastline at Pt Dume with core reflectivity > 35 dBz
0123	Light rain at radar. Malibu .02 and CXR .16 1-hour ending 0100 UTC
0130	Pronounced BB
0135	Precip band weakening, moving through burn areas
0138	Sepul Cyn reporting with band .08
0147	Next band approaching coast slightly more defined, stronger and extends further east. BB present but weakening
0200	Agura .24 1-hour ending at 0200 (6 PM)
0205	SPECIAL MARINE WARNING NATIONAL WEATHER SERVICE OXNARD CA 547 PM PST THU JAN 24 2008 THE NATIONAL WEATHER SERVICE IN OXNARD HAS ISSUED A * SPECIAL MARINE WARNING FOR... INNER WATERS FROM POINT MUGU TO SAN MATEO PT. CA INCLUDING SANTA CATALINA AND SANTA BARBARA ISLANDS OVER PACIFIC WATERS...INCLUDING POINT MUGU.
0210	Scatter showers in form of W-E bands continue to form parallel to coastal region south of burn area. Bands continue to move north over burn areas with marginal rainfall with exception of the areas around Oxnard to Santa Barbara. Drizzle at radar.
0220	E-W band moving over burn areas. Most intense part of band west of burn areas coinciding with are of special marine warning.
0233	Winds increasing BB increasing
0240	Strongest activity continues from Ventura Harbor to Pt Dume. Strong cells moving inland as reflected by .20+ 1-hour gauge amounts from Lechuza and Agura
0244	GC continues to be too aggressive
0257	Scattered showers developing SW of radar moving north.
0315	Most intense activity continues to move on shore slightly west of Pt Dume. Some moderate activities moving through burn areas. This event will requires careful

	examination to ascertain how much echo is actual reflects surface precip.
0326	Stream of Cells continue to move west of Pt Dume continue to intensify as they move inland. Appear of a S to north training echo and obvious FF situation unfolding. Lechuza .48 in last hour with Agura at .72 in the last 3 hours.
0330	Small intense cell moving 10-km north of radar. Several gauges reporting .10 + associated with cell. Cell, if it holds together , will move over Sepul Cyn which received .20/.40 in 1/3 hour(s). Del Air Hotel reported .48 1-hr with cell.
0340	Cell expanding in area coverage and fairly deep comparatively.
0345	Activity has consolidated into a fairly intense W to E band extending from just north of Pt Dume eastward to 15 km north of radar stranding Highway 101. A second band is forming in a similar orientation parallel to the coast from Dume to LAX. Light precip at radar
	755 PM PST THU JAN 24 2008 THE NATIONAL WEATHER SERVICE IN OXNARD HAS ISSUED A * SPECIAL MARINE WARNING FOR... INNER WATERS FROM SANTA BARBARA TO SAN MATEO PT AND OUT 30 NM. * UNTIL 1000 PM PST * AT 748 PM PST...SEVERAL STORM CELLS CONTINUED TO DEVELOP ACROSS THE INNER WATERS. SOME OF THESE STORM CELLS HAVE INDICATED ROTATION ...THEREFORE WATERSPOUTS...BRIEF HEAVY RAIN...DANGEROUS LIGHTNING...SMALL HAIL AND VARIABLE GUSTY WINDS TO 35 KNOTS WILL BE POSSIBLE THROUGH THIS EVENING. AT THIS TIME...A QUICK DEVELOPING THUNDERSTORM NEAR CATALINA ISLAND WILL CONTINUE TO MOVE TO THE NORTHEAST AT 25 KNOTS TOWARDS LONG BEACH.
0355	Off shore activity increasing coverage and intensity especially south of burn areas. Weak couplets in Velocity but requires more investigation. Loops show activity moving to the NE with western N to S back edge. BB reforming.
0405	Difficult in determining actual echo verses extensive sea clutter at low levels – considerable ducting.
0420	Small intense cell just west burn area. Cell moving NE and transverse northern part of burn area. CXR .16 Beacon .16 and Cheeseboro .18 1-hour ending 0400 UTC
0430	Activity increasing intensity across northern gulf
0445	Well defined couplet with cell west of radar 10 km just south of burn area. Northern part of cell extending slightly in burn area. Cell encompassed within NWS warning. BB
0450	Most intense cell has a bow echo characteristic and moving rapidly E-NE along coast extending into eastern burn area. Big Rock Mesa .12 1-hour ending at 444 UTC.
0500	Eastern burn area likely experiencing moderate precip associated with cell. Cell continues to straddle coasts with main core just offshore. Elevated core with possibly small hail. NWS issued tornado warning for Malibu and surrounding coastal communities at 0448. Associated with this cell. Good vel couplet.

0535	JJ taking over as observer. Very intense cell just W of radar over the ocean had reflectivity ~ 60 dBZ, now appears to be weakening some. Isolated cells still impacting burn area. Bulk of activity appears to be propagating slowly to E.
0551	Strong cells with reflectivity near 45 dBZ remain close to proximity of radar from NW through SW, but will no longer be impacting burn areas. BB quite visible at upper tilts.
0555	At far range, can see very thin band of precip with NNE-SSW orientation near shoreline. This will eventually propagate Eward and possibly impact burn areas.
0602	AT 856 PM PST...SEVERAL THUNDERSTORM CELLS WERE ACROSS THE INNER WATERS OF SOUTHERN CALIFORNIA. A STRONG THUNDERSTORM HEADING NORTHEAST TOWARDS LONG BEACH IS LIKELY PRODUCING A WATERSPOUT. DANGEROUS LIGHTNING AND SMALL HAIL. ANOTHER CELL 20 MILES OFF THE COAST OF SANTA MONICA AND IS HEADED TOWARDS PACIFIC PALISADES AND SANTA MONICA. THESE STORM CELLS ARE MOVING NORTHEAST AT 20 KNOTS.
0605	Flash flood warnings issued for strong cells just now making landfall in LA, near radar site: BULLETIN - EAS ACTIVATION REQUESTED FLASH FLOOD WARNING NATIONAL WEATHER SERVICE OXNARD CA 953 PM PST THU JAN 24 2008 THE NATIONAL WEATHER SERVICE IN OXNARD HAS ISSUED A * FLASH FLOOD WARNING FOR... SOUTH CENTRAL LOS ANGELES COUNTY IN SOUTHWEST CALIFORNIA...THIS INCLUDES THE CITIES OF...LONG BEACH...LAKEWOOD...COMPTON...AND NORWALK... * UNTIL MIDNIGHT PST * AT 950 PM PST...NATIONAL WEATHER SERVICE DOPPLER RADAR INDICATED A STRONG THUNDERSTORM COMPLEX AFFECTING MUCH OF SOUTH CENTRAL LOS ANGELES COUNTY...WITH ADDITIONAL HEAVY RAIN JUST OFFSHORE. INTENSE RAINFALL RATES UP TO ONE INCH PER HOUR ACROSS THE WARNING AREA WILL LIKELY CAUSE SIGNIFICANT AND DANGEROUS ROADWAY FLOODING.
0611	Observations outside indicate moderate wind from the S, no visible lightning.
0627	A large area of intense rainfall persists onshore over LA. Another area of intense

	activity remains over the ocean and will be moving NE-ward toward radar site. All in all, bulk of activity has moved E of burn area. However, thin bands of precipitation with a SSW-NNE orientation have been forming in the unstable air upstream of the burn areas. These will likely have some impact in the next few hours.
0636	Very intense cell at 210° from radar has max reflectivity ~ 60 dBZ, and has a kidney bean shape, with a small hook on S flank of storm. No velocity couplet seen at low levels yet. Upper level velocity pattern indicates storm top divergence. Very clear BB signature with max reflectivity ~ 40 dBZ surrounding radar.
0641	Reflectivity has increased on hook appendage of storm still at 210°. Velocity couplet now obvious if you subtract out storm motion. Shear appears to be > 15 kts, and some of the velocities are folded at elevations > 4.1°.
0647	Hook still persisting with reflectivity > 60 dBZ in core. Hook seen in reflectivity all the way up to 12.5°. However, storm is less than 10 km away and moving toward radar!
0653	Walked outside for visual observation but see no lightning to my surprise. Still see very impressive reflectivity signature with storm. Storm starting to get too close and getting in radar cone of silence. Hook visible all the way to 15.6°.
0656	See a few pixels with outbound (positive) velocities at low elevation angles with storm situated to the SW. Some pixels have been removed due to QC. Either way, gate-to-gate shear must be > 20 kts at low levels.
0703	Core of storm has just moved directly overhead. Rainfall rate have intensified as a result. Hook still evident on reflectivity.
0706	Very heavy rain at site. Planes are still landing despite intense rainfall and shear seen on radar.
0709	Rain stopped suddenly which had me very worried. I looked outside and had very low visibility to the W toward ocean. Then, squall passed directly over radar...heard rain shaft come right up road. I think this was the back edge of the hook.
0711	Rain stopped immediately at radar site.
0716	Now that the small supercell has moved safely to my NE, I can see a clear velocity signature of a rotating mesocyclone up to 5.1° with > 25 kts of gate-to-gate shear. Believe this storm should at least have a svr warning on it. Need to get number of wx service...
0727	Meso seems to be falling apart now. Will focus on burn areas. Very large region of stratiform precipitation to the S-SW of radar will likely move this way. More convectively unstable storms just now beginning to impact burn areas from
0739	I am becoming concerned that something isn't working with the creation of radar loops to the smartr computer. Currently, the latest image is for 0652.
0755	OK. I had to restart the update_loops.sh script on the smartr.metr.ou.edu computer. I checked and the png files were being created and properly sent. No animated gif files were being created. I don't know what caused the script to crash, but will keep an eye on it in the future.
0757	In the meantime, a very large region of stratiform precipitation has formed over the ocean in the southern 180° of radar, within 20 km. This is the thickest and most intense melting layer signature I've seen with this IOP. Also, isolated storms

	are still forming near and to the W of the burn areas.
0812	W edge of large region of stratiform precipitation may impact E part of burn area. In addition, moderate showers have formed upstream of basins over ocean. Will continue to monitor their progress.
0819	From 0100-0700, Malibu has received 0.43" and Santa Monica 0.41". Just to the W of Malibu, Circle X Ranch received 0.87".
0824	<p>FLOOD ADVISORY NATIONAL WEATHER SERVICE OXNARD CA 1220 AM PST FRI JAN 25 2008</p> <p>CAZ040-041-044>047-053-054-088-251115- 1220 AM PST FRI JAN 25 2008</p> <p>THE NATIONAL WEATHER SERVICE IN OXNARD HAS EXTENDED THE</p> <p>* URBAN AND SMALL STREAM FLOOD ADVISORY FOR VENTURA AND LOS ANGELES COUNTIES INCLUDING THE CITIES OF DOWNTOWN LOS ANGELES...LONG BEACH... THOUSAND OAKS...AND VENTURA.</p> <p>* UNTIL 315 AM PST</p> <p>* AT 1215 AM PST...DOPPLER RADAR INDICATED AN AREA OF MODERATE TO HEAVY SHOWERS CONTINUING OVER A LARGE PORTION OF VENTURA AND LOS ANGELES COUNTIES. RAINFALL RATES BETWEEN ONE QUARTER AND ONE THIRD OF AN INCH PER HOUR WILL BE COMMON ACROSS THE ADVISORY AREA...WITH LOCAL RATES UP TO ONE HALF INCH PER HOUR.</p>
0845	Currently, the burn areas are receiving little to no rainfall. However, new developments are evident just to the W of the basins and there is a larger area of precipitation approaching the basins from SW over the ocean.
0857	Storms have intensified to the SW of the burn areas with max reflectivities ~ 50 dBZ. Portions of the cells are just now entering the basins of interest.
0905	A band of cells oriented SSW-NNE continue to intensify with max reflectivity > 55 dBZ. Storms are aligned such that they will train over the western burn area, creating a prolonged period of rainfall.
0928	Inspection of a reflectivity loop shows the cells are lining up just to the W of the western basin. The W-E general propagation of showers seems to have slowed

	suggesting the upper low may be retrograding.
0932	Additional cells are forming again out over the ocean and may be far enough E such that their N movement will put them back over the burn areas. If they end up W of the burn areas, then the upper low must be retrograding.
1001	Similar to previous patterns of precipitation, cells have become aligned in a band extending from the S-N. As it propagates N, it looks like it will make a direct hit on burn areas.
1017	Precipitation from band is just now entering burn areas. Cells have now become quasi-linear, perhaps described as a line echo wave pattern.
1032	Looks like the eastern burn area will receive the brunt of the rain from the line of cells that have intensified over the last 30 min. Another similar looking band of precipitation has formed over the ocean to the SW and will likely impact the burn areas in the next hour.
1044	Train echoes appear to be setting up over the ocean and then making landfall. The latest one landed just a tad E of the eastern burn area. These lines of storms have max reflectivities as high as 55 dBZ and intensify quickly. The next round of precip for the burn areas appears to be in the right location to train over the burn areas.
1112	The previous linear structures have become more fragmented as the cells make landfall in the burn areas. Max reflectivity is ~ 45 dBZ.
1129	<p>FLASH FLOOD STATEMENT NATIONAL WEATHER SERVICE OXNARD CA 245 AM PST FRI JAN 25 2008</p> <p>LOS ANGELES CA- 245 AM PST FRI JAN 25 2008</p> <p>...THE FLASH FLOOD WARNING HAS EXPIRED FOR CENTRAL LOS ANGELES COUNTY...</p> <p>THE HEAVIEST RAIN HAS MOVED OUT OF THE AREA. HOWEVER...PERIODS OF RAIN...OCCASIONALLY HEAVY...WILL CONTINUE THROUGH THE EARLY MORNING HOURS.</p>
1132	Moderate cells still over burn areas. A look at long-range images shows this may be the last of the IOP. Will take a close look at loops before making a decision to shut down for the night.
1204	Just checked out real-time gauge reports from Malibu and they received > 0.4" from 10-11 UTC.
1213	Precip has moved E of the burn areas. So, I've decided to end this IOP.
1350	Ken arrived on site. Wave guide compressor non functional. MotoSat system

	unable to lock on satellite. Busy and Search panel status lights blinked for 20 minutes and then system restored. Powered down and restarted search.
1405	Began data collection. Moderate showers reformed SW of burn area
1430	Restarted motosat system but continues to fail in locking
1439	W-E band of moderate showers continues to move N and into burn areas. NO further development south behind band. Band extends from just SE of Pt Dume NE 30 Km. Most intense cells south of Malibu
1444	Sea clutter increasing. Rain has ended at radar.
1445	Band encompassing both burn areas and continues to move north. Big Rock Mesa .32 with band
1452	Strong cell in western burn area with core reflectivity $s > 50$ possibly small hail.
1500	Band now north of burn areas becoming more multi cellular.
1501	Band continue moving north with no back building towards burn areas.
1510	Scattered and weak showers developing in southern bay
1515	MotoSat still unable to lock after fourth search restart.
1518	New cells consolidating in mid bay area
	<p>LOS ANGELES CA- 656 AM PST FRI JAN 25 2008</p> <p>...A FLASH FLOOD WARNING REMAINS IN EFFECT UNTIL 730 AM PST FOR SOUTHERN LOS ANGELES COUNTY..</p> <p>AT 648 AM PST...NATIONAL WEATHER SERVICE DOPPLER RADAR CONTINUED TO INDICATE A CLUSTER OF THUNDERSTORMS BETWEEN MALIBU AND WOODLAND HILLS...LIKELY PRODUCING FLASH FLOODING OVER THE WARNED AREA. OTHER MODERATE TO HEAVY SHOWERS EXTEND FROM BEVERLY HILLS TO PASADENA AND BURBANK.</p> <p>LOCATIONS IN THE WARNING INCLUDE BUT ARE NOT LIMITED TO VAN NUYS.. PASADENA...WOODLAND HILLS...GLENDALE AND BURBANK</p>
1645	Minor shower activity develop south and move through burn areas.
1650	MotoSat finally locked
1651	Light rain at radar
1716	Activity increasing across bay region as well as to the west of Catalina. Very small and occasionally moderate core cells occurring over burn areas. Very convective pulse type storm organization.
1720	Restarted DF web feed
1724	Small short lived cellular convection continues to develop along coast and moving NE slow into burn and adjacent areas. A more organized precip band developing N-NW of Catalina Is

1755	W-E band continues to strengthen with core ref 40+ Based on loops the band is moving directly north with growth at each end
1806	Band weakening and becoming very cellular with small cores of less than 35 dBz.
1812	Light rain at radar
1822	NATIONAL WEATHER SERVICE LOS ANGELES/OXNARD CA 1000 AM PST FRI JAN 25 2008 .UPDATE...HAVE ISSUED AN UPDATE...POINT PIEDRAS BLANCAS LOW LEVEL PROFILER HAD INDICATED A SHARP RISE IN THE SNOW LEVEL TO 5KFT OVERNIGHT AND SPOTTERS IN THE ANTELOPE VALLEY INDICATED RAIN AT THIS TIME. SNOW ADVISORY EXPIRED FOR ANTELOPE VALLEY. WHILE SOUTHWEST FLOW CONTINUES TO INCREASE DOWNSTREAM FROM THE LOW CENTERED APPROXIMATELY 370 MILES WEST OF THE BAY AREA THE SNOW LEVEL WILL LIKELY CONTINUE TO RISE THROUGH TODAY. OTHERWISE NO OTHER CHANGES...A BAND OF SHOWERS LINGERING WHILE EXITING THE EAST HALF OF THE AREA CONTINUES TO SPREAD LIGHT TO MODERATE RAIN RATES OVER THE AREA WHILE LIGHT RAIN RATES MOVES OVER THE NORTH AND WEST HALF WITHIN STRONG ASCENDING SOUTHWEST FLOW OVER THE NORTH AND WEST HALF OF THE AREA.
1831	Band now approaching coast. Moderate cell at western end just south of Pt Dume. Secondary band starting to form southern portion of bay
1837	Band intersecting coast with strongest cell SW of Dume and east of burn areas. Moderate area of reflectivity increasing and moving north into burn areas. Secondary band continues to form in southern part of Bay
1852	Moderate ref encompassing both burn areas associated with band W-E band. Secondary band continues to strengthen in Bay and is slightly more inland.
1857	Band intensifies while exiting burn areas now centered along H101. Topanga Cyn showing .16 in hour ending 1900 associated with band. Big rock Mesa may not be reporting. Monte Nido .04; CXR .16 and Malibu at .03 for same period
1905	Second band becoming for diffuse as it moves north towards the coast. As with the previous 7 band would expect this band to strengthen before moving across burn areas. Amazing firehouse pointed at burn areas and LA for the last 48 hours
1910	Light rain at radar associated with secondary band.
1919	Winds becoming more gust as eastern end of band pass to the north of radar. Band inland
1921	2 nd band moving through burn areas with small cores. Moderate reflective and rainfall east of burn area center edon Malibu and east. to N of LAX. No additional bands forming south.
1932	No additional activity approaching burn areas nor bands forming in Bay.
1952	No redevelopment and or additional activity possible impacting the burn areas. Ocasional blue sky overhead.
2007	Conclude IOP