



RE: Preliminary Mass Balance Summary

Rodriguez, Julie to: Labson, Victor F
Cc: "McNutt, Marcia K", "Hines, Vic"

05/28/2010 06:27 PM

History: This message has been replied to.

Marcia,

Please let me know when you want this to go public. Victor mentioned that it is still in draft form but we need to get it out sooner rather than later.

Thanks,

Julie

From: Victor F Labson [mailto:vlabson@usgs.gov]
Sent: Friday, May 28, 2010 5:09 PM
To: Rodriguez, Julie
Cc: McNutt, Marcia K
Subject: Preliminary Mass Balance Summary

Julie,

Here is the preliminary summary of the Mass Balance estimation. We are fact checking and pinning down the sources, mostly NIC as it turns out. This obviously is not ready to go out.

Vic

Victor F. Labson, Ph.D.
Director - Crustal Geophysics and Geochemistry Science Center
US Geological Survey
Denver, Colorado
Phone 1(303)236-1312, fax (303)236-1229



e-mail vlabson@usgs.gov MassBalanceTeam052710.doc

**National Incident Command, Interagency Solutions Group
 Department of Interior Representation
 Mass Balance Team of the Flow Rate Technical Group
 May 26, 2010, Estimate of Average Oil Leakage Flow Rate**

Executive Summary

The high and low estimates of average oil leakage per day were determined from analysis of data obtained from space and airborne sensors of the surface oil in the Gulf of Mexico on May 17, 2010. MODIS satellite imagery of that day were used to estimate the total surface area of oil on the water (~17,725 km²). The MODIS data also indicated regions of "thick" oil based on reflective response. The "thick" oil region was further characterized by AVIRIS (Airborne Visual InfraRed Imaging System) data flown over the surface oil on May 17, 2010. Field calibration of "thick" oil led to an algorithm for using pixel response values of AVIRIS data to determine oil volumes per pixel. These values were extrapolated from the AVIRIS coverage to the MODIS-determined "thick" oil areas. This procedure is covered by a USGS Open File Report now in review, and led to an estimated range of 70,000 to 150,000 barrels of oil in the "thick" region of the surface oil image of May 17, 2010. Outside information provided to the group included total barrels of oil skimmed as of May 17 (23,757: Coast Guard), total barrels of oil burned as of May 17 (11,642: Coast Guard), percentage of surface oil evaporated (38%: *source needed*), and percentages of total surface oil coverage considered "thick" (2%), "dull" (10%), and "sheen" (88%), with the AVIRIS estimate assumed to include all of the "thick" oil. The amount of oil in the 1,773 km² of "dull" area and the 15,598 km² of "sheen" area was estimated with a range of oil thickness for each area. For the "dull" area the thickness range was 3 to 6 microns, and for the "sheen" area the thickness range was 0.3 to 0.6 microns. This resulted in estimated oil volume ranges for the "dull" and "sheen" areas, respectively, of 33,510 to 67,020 barrels, and 29,480 to 58,960 barrels. The total range of 168,389 to 311,379 barrels on the surface, skimmed, and burned as of May 17 was compensated for 38% evaporation for 232,377 to 429,703 barrels leaked as of May 17. These values were divided by 22 days of non-dispersed leakage from April 26 to May 17 to yield average leakage estimates of 10,563 to 19,532 barrels per day.

The values in barrels are summarized below.

<u>Low Estimate</u>	<u>High Estimate</u>	<u>Explanation</u>
70,000	150,000	2% area "thick" oil from imagery
33,510	67,020	10% area "dull" oil
29,480	58,960	88% area "sheen" oil
23,757	23,757	burned oil
<u>11,642</u>	<u>11,642</u>	<u>skimmed oil</u>
168,389	311,379	sub-total as of 05/17/2010
<u>63,988</u>	<u>118,324</u>	<u>38% evaporated</u>
232,377	429,703	total leaked as of 05/17/2010
10,563	19,532	average per day for 22 days