



## Hurricane Ike and Oil Refineries/Infrastructure Thread #2 (9/10 16:30 EDT)

Posted by [Nate Hagens](#) on September 10, 2008 - 10:15am

Topic: [Supply/Production](#)

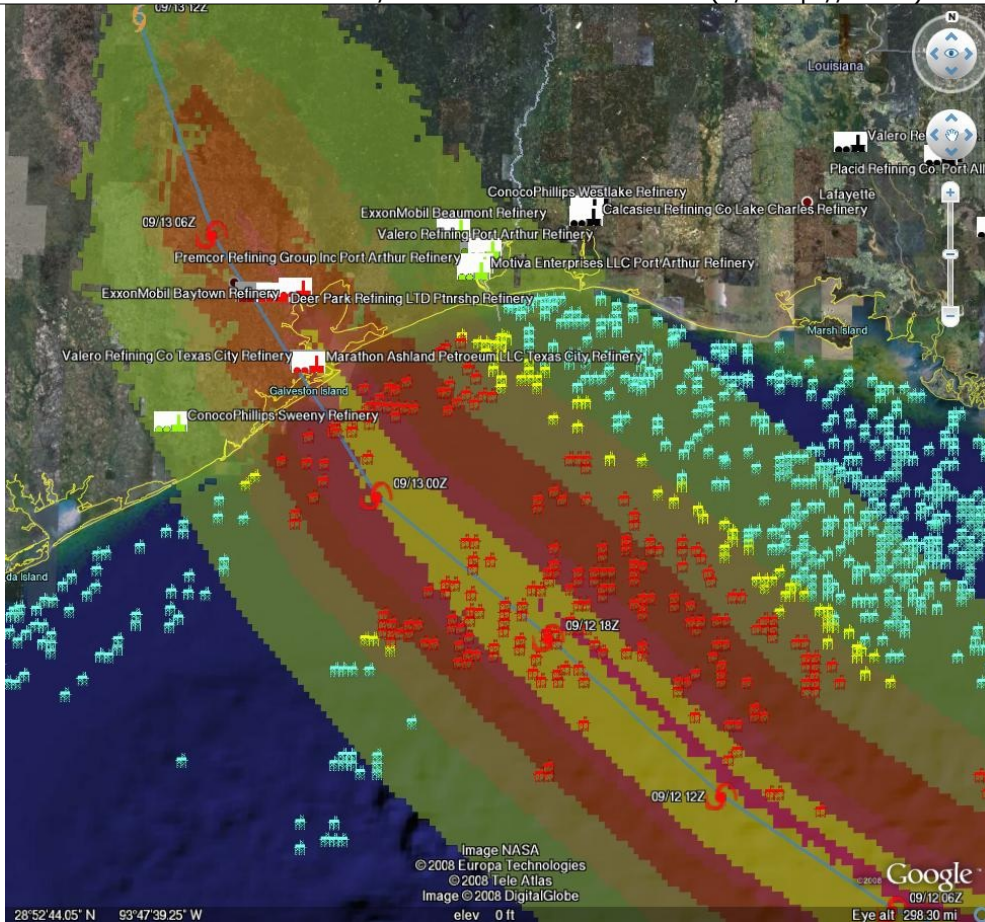
Tags: [chuck watson](#), [henry hub](#), [hurricane gustav](#), [hurricane ike](#), [loop](#), [louisiana offshore oil port](#), [methaz](#), [oil](#), [oil infrastructure](#), [original](#), [peak oil](#), [refineries](#), [refining](#), [shut-in production](#) [[list all tags](#)]

(Welcome: we are now on a later and more updated thread, which can be found here: <http://www.theoil Drum.com/node/4525> NB: you may want to just go the front page (it will be post #1 or #2) to get to the most recent thread: <http://theoil Drum.com ...>)

Hurricane Ike's current track predicts landfall between Corpus Christi and Galveston, but has been moving northwards. **Within the current NHC storm path lies about 5 million bpd of US petroleum refining capacity.** (Perspective: 5 MMBBL is about 30% of US capacity (about 15 MMBBL), and a bit less than 6% of global capacity (~85 MMBBL). Also, the [MMS](#) reported Wednesday that staff has been evacuated from 452 production platforms (63.0%) and 81 rigs (66.9%) – (95.9% of the oil production and 73.1% of the natural gas production has been shut-in as a precautionary measure for Hurricane Ike.)

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Current path estimates for Hurricane Ike (Methaz GFDK Sep 10 18Z (2pm EDT))-click twice to enlarge

For all graphics: Rigs/Platforms: Blue: evacuated only; Yellow will require inspection before restart; Red: damage requiring repair; Refineries: Black: operational impact (partial shutdown) Green: Operational impact (full shutdown) Red: Damage likely; Ports: standard hurricane flags for wind

Here is the latest update from [Chuck Watson at KAC/UCF](#) 10 Sep 16:30 EDT.

Well, Ike didn't entrain any dry air, and has been moving quite slowly, although intensity has not picked up as much as I would have thought given that scenario. Still, I think the Cat 2 cap I was thinking this morning is probably low and the storm could reach Cat 3 before landfall. That said, I don't think it will be Cat 3 at landfall, but that is instinct more than analysis. GFDL sort of agrees - minimum Cat 3 at landfall. How's that for equivocating?

**If the GFDL scenario plays out at Cat 3 or higher, current tracks are *bad news* for refining capacity. The current GFDL scenario is very close to the LBAR scenario mentioned this morning. Current track would take out long term 5-10% of GOM production, but that's not the problem. So, if the GFDL scenario plays out at a Cat 3 or higher, we are looking at having 20% of US refining capacity, and 5% of global capacity, offline for a month or more.**

**Production side damage becomes irrelevant at that point.**

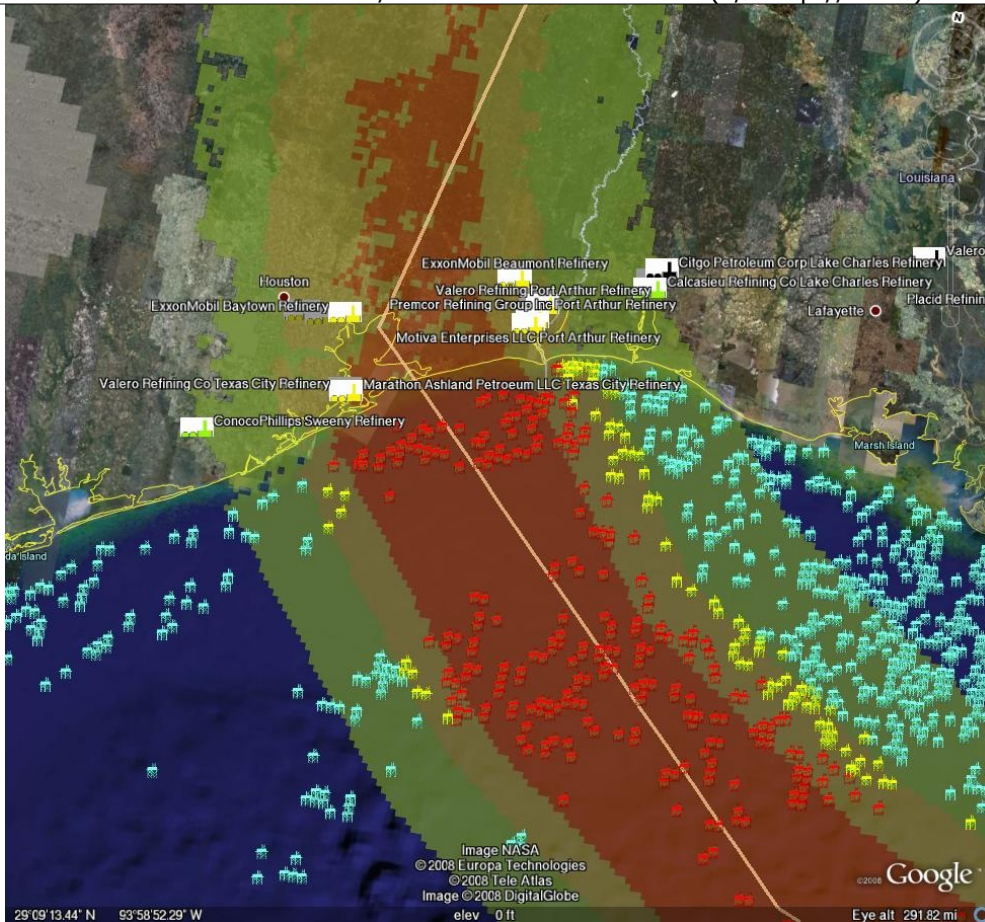
Once again I'd like to remind everyone that these discussions are with regard to a bunch of valuable, important, but ultimately replaceable hardware. Follow the instructions of your local officials, and evacuate if that is recommended.

(Below is this mornings (sep10 11:30EDT) update, (since revised, but it contains additional information)

Ike's track continues to move slowly northwestward, and while organization is fair, it has apparently not started rapid intensification as of 9am. On the current track the storm will skirt south of the key Gulf of Mexico (GoM) infrastructure. However, it is vital to understand that very slight wobbles - even 10-20 miles - can make a huge difference in damage. Remember that swath of heavy damage for most hurricanes, even intense ones, is only 50-75 miles wide. Also recall that damage is exponential - 110 mph winds may be 10% higher than 100 mph winds, but will cause 20% more damage.

Above is the 8am ET LBAR scenario, which is about as "worst case" as this storm can get. It would take out over 5 MMBBL of refinery capacity for an extended period - 30% of total US refining capacity. This nightmare track is at the moment on the northern edge of the guidance, but well within the realm of possibility at this point. On the current official forecast track and key dynamic models (GFDL, HWRF) the storm grazes the southern edge of key production/processing areas, causing short term outages largely due to evacuations and precautionary shutdowns but no extensive damages.

As for intensity, there is dry air to the west of the storm. It is not yet entrained, but if it does, the intensity estimates may be on the high side. Our present thinking is that OCS and landfall intensity will not be over Cat 2, something the infrastructure can handle with minor damage. As a side note, these tracks are far enough north to avoid PEMEX assets.



*Current path estimates for Hurricane Ike (Methaz LBAR Sep 10 12Z (8am EDT))-click twice to enlarge*

NHC Forecast for Hurricane Ike - click to go to Wunderground

[Here](#) are depictions of various Texas cities storm surge maps under different Hurricane scenarios from Weather Underground.

Regarding [Port of Houston](#):

The Port of Houston is closing tonight as Hurricane Ike approaches, most coastal refineries will make storm decisions today, and offshore energy facilities are extending precautions they took just a week ago for Hurricane Gustav.

The Barbours Cut and Bayport terminals will shut down at noon today, and the port will close to all vessel traffic at midnight, spokeswoman Argentina James said.

The Port's 25-mile-long complex is a hub in the nation's energy network.

Forecasts Wednesday evening projected Ike would come ashore Saturday between Corpus Christi and Galveston.

Port Freeport, about 65 miles south of Houston in a mandatory evacuation zone for Brazoria County, shut down early Wednesday afternoon and expects to reopen Monday, Chief Executive Pete Reixach said.

As vessel traffic declined, gasoline retailers were gearing up for a possible surge of evacuating motorists.

Motiva, a refining and retail gasoline joint venture between Shell Oil Co. and Saudi Arabia's state-owned Aramco, said in a prepared statement that its coastal service stations and refueling terminals were being stocked up in anticipation of higher demand.

Shell-branded stations also were setting up generators to keep pumps running in the case of a power outage.

We will be posting periodic updates of track and damage forecasts here, because one never knows if one of these events will be seminal. We're not hurricane experts at theoil Drum.com. Thankfully we have an expert meteorologist who sends us track and damage forecasts relevant to oil and gas infrastructure. What we try to do on this site, (and have been doing for over 3 years), is articulate the fragility and urgency of our nation's, and our world's, energy situation. As Hurricane Ike moves nearer, and professional analysts gauge the impact it may have on our energy infrastructure, feel free to browse our archives of empirically based analyses and perspectives on the many aspects of our energy situation that form the backdrop not only for this hurricane, but for any exogenous event that disrupts the increasingly uneasy balance between energy supply and demand.

Chuck Watson has put together a dynamically updating page that will reflect the latest damage models/forecasts at this link: [KAC/UCF models](#). We will be updating this thread with damage estimate and breaking news as this story unfolds.

A note on our modeling process: we take the official NHC track, the raw computer model tracks like GFDL, HWRF, LBAR, etc, and even run our own in-house fast cycle track/intensity models. These track and intensity estimates are feed to our main hurricane model (TAOS), which computes the wind, waves, storm surge, currents, etc. at each point in our database of over 50,000 elements in the GoM like rigs, platforms, pipelines, pumping stations, refineries, etc. We then have engineering models for each type of infrastructure that calculates the damage and estimated down time for that element, as well as downstream impacts (eg if a pipeline is down, the upstream elements can't pump and the downstream elements don't get product).

## PRODUCTION/INFRASTRUCTURE MAPS AND REFINERY INFORMATION

[Here's a link to a really good map of oil refining/SPR storage facilities in respect to the path of Katrina \(NB: OLD TRACK MAP!\)](#) and [here is a listing of production and refining capability for the state of LA.](#)



Just to give you a rough idea of where things are, the map above is a [probability swath for Katrina](#) (OLD TRACK MAP!) with the [Thunder Horse](#) platform as the red dot, and the other purple dot represents the [Mad Dog](#) development (100,000 bd); the [Holstein](#) development that produces at peak, around 100,000 bd of oil; and the [Atlantis field](#) that may have ramped up to around 200,000 bd in all. Put together these projects have the potential of around 650,000 bd, but as can be seen, they were sitting in an uncomfortable spot relative to the track of the Katrina. The white dot is where Port Fourchon is. This is where the [Louisiana Offshore Oil Port, or LOOP](#), is located. [Rigzone](#) pointed out that this is where the foreign tankers offload, [Google](#) and [Terraserve](#) maps you can see that the area is very low-lying. One of the big concerns is that there will be sub-sea landslides or other ground movement that might affect the LOOP. Were this to be disrupted, then foreign tankers would need to be diverted elsewhere, with the likely port being Houston.

[Here is a really good link/map \(from "Rod and Reel" no less\) of the LA southern coastline showing all of the Submersible and Floater Gulf rigs.](#)

We have accumulated resources from previous hurricanes below, but we'd like to find updated materials if you know of them. Recent refinery maps, recent rig maps in the gulf, recent gas fields, SPR facilities, the Intercoastal Canal, pipeline stations and transfer points, etc., etc. Leave links in the comments please.

Also, here's the EIA's [Alabama](#), [Louisiana](#), [Mississippi](#), and [Texas](#) Resources pages. They will also likely come in handy. Also, here's a [link to the national page](#).

[Here's another good resource for infrastructure maps and such. \(scroll down a bit\)](#)

[Here's a map from CNN with large and small refineries laid out.](#) (though it is an old storm track)

[Very detailed piece by RIGZONE on rigs and other infrastructure in the area.](#) (thanks mw)

[Here's a flash graphic of the oil refineries and rig maps from Hurricane Rita, it emphasizes Beaumont and Galveston's importance.](#) Click on oil production in the tab. Note the many rigs on the east side of the storm that will get the brunt of the damage from the NE quad of the storm...hence the high long-term GOMEX oil production damage estimates below.

[Here's a link to Rigzone's coverage of Ike.](#)

You want a detailed map? Well [here's the probably the best MMS map I could find. Very detailed and lots of interesting stuff. \(VERY big .pdf warning\)](#)

Also, Scott Wilmoth at [Simmons & Co](#) was kind enough to send us this map. The map below captures only deepwater infrastructure. For a complete list of deepwater development systems (includes operator, depth, location): <http://www.gomr.mms.gov/homepg/offshore/deepwatr/dpstruct.html>

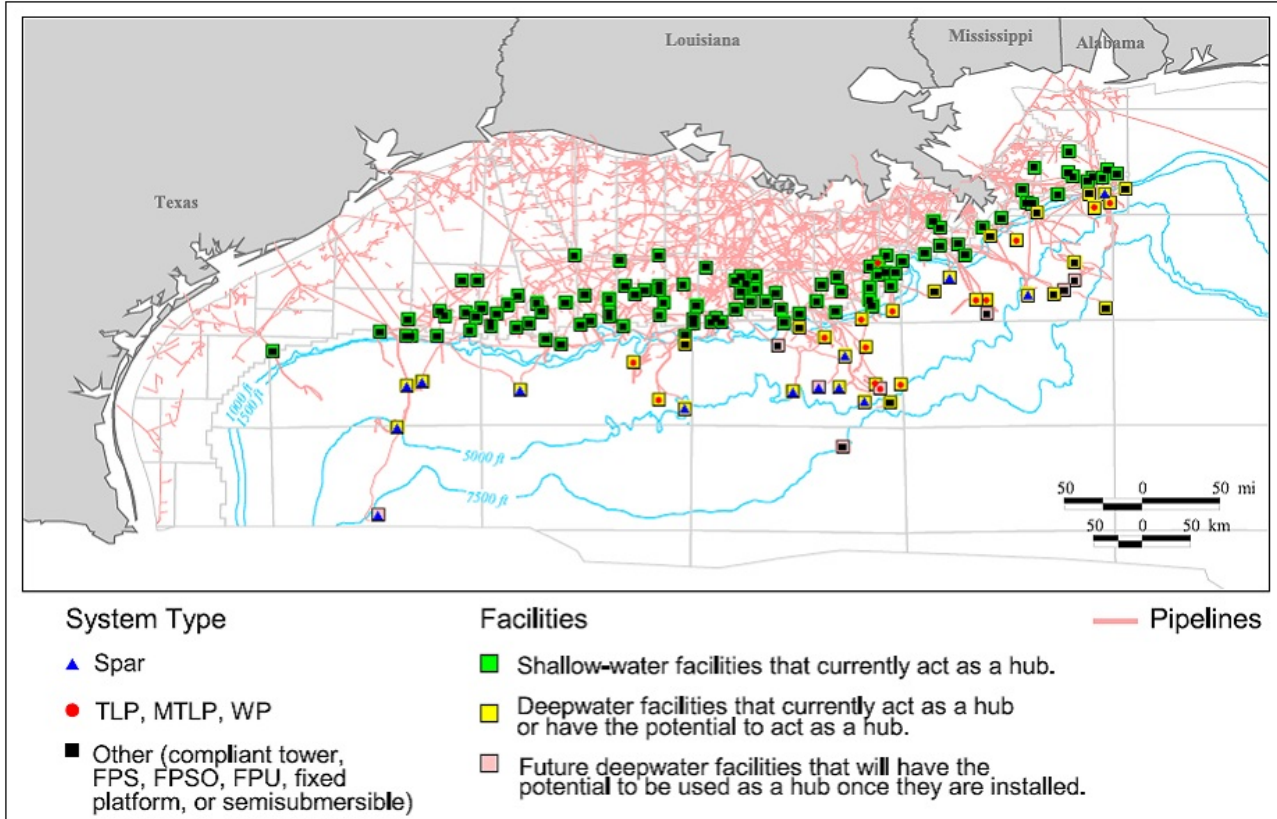


Figure 10. Current, potential, and future hub facilities.

*(Please deposit new relevant links, graphs, and comments in this new thread...we have updated the resources part of this post with new maps and some more old maps and articles from Katrina on the LOOP and Port Fourchon--important parts of the infrastructure, as we learned about three years ago. Please leave personal anecdotes and themes unrelated to hurricane for the other upcoming 'bigger picture' posts, as some of these larger images are difficult to upload for those on dial-up)*

*We appreciate your help accumulating resources, stories, and newstips in the comment thread below!*



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