



## Gulf of Mexico Storm Watch

Posted by [methaz](#) on June 26, 2010 - 10:40am

Topic: [Supply/Production](#)

Tags: [deepwater horizon](#), [gulf of mexico](#), [hurricanes](#), [oil spill](#) [[list all tags](#)]

### 11am ET update

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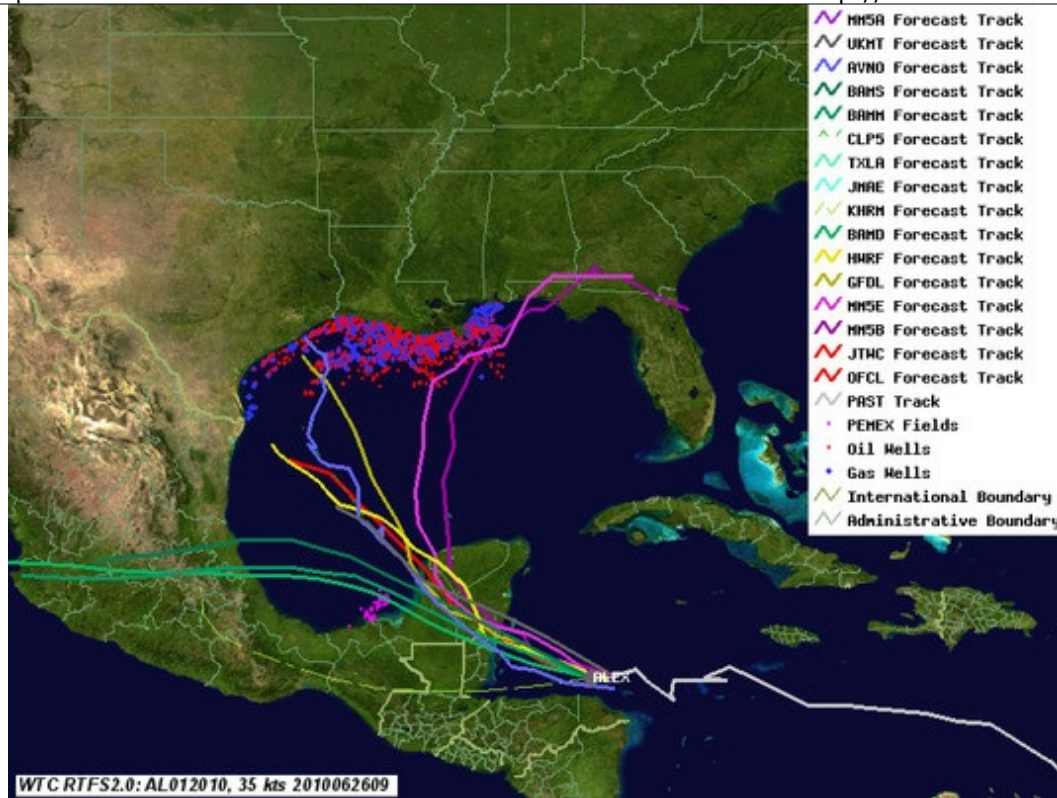
### 9am update

The latest (8am) model runs shifting further west, towards the TX/Mexico border and south. On this track and intensity, the Deepwater Horizon site would see 6 foot waves at worst, and no wind. Winds now 40 knots (46mph).

### Updated tracking discussion as of 7am ET, Saturday 26 June

TD#1 is now Alex, with 35kt winds. The impact on Gulf production, and especially the Deepwater Horizon (DH) Spill response, are still uncertain, but of increasing concern. The official forecast - backed by several key models - is now showing the storm over the Western Gulf reaching near hurricane intensity by Wednesday evening. How close the storm gets to US Production - and the DH response site - depends on how strong a "ridge" in the atmosphere remains early next week. If it stays in place, the storm will stay towards Mexico. If it weakens somewhat, the NHC track is most likely, if it seriously deteriorates, the tracks in purple come in to play.

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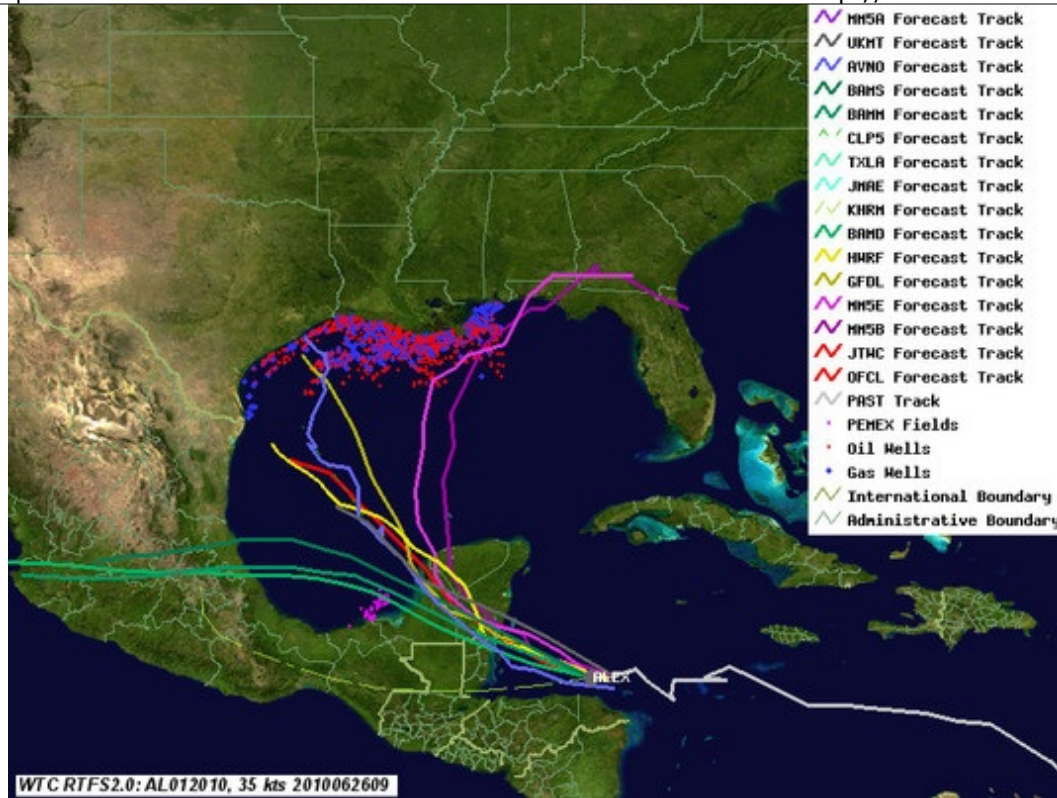
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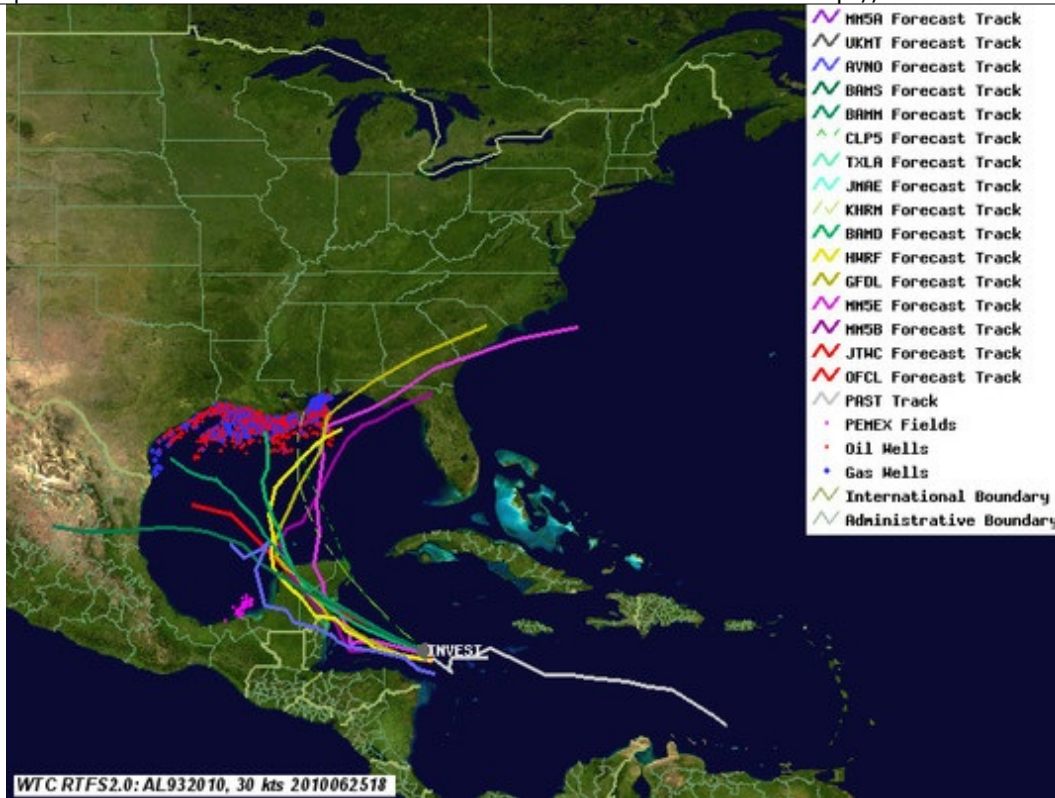


### Original Post Below the Fold

*This is the first post by [Chuck Watson](#) (aka methaz), Director of Research and Development for [Kinetic Analysis Corporation](#) (KAC). KAC provides detailed impact and risk assessments to a wide variety of commercial and government clients, including most of the Caribbean governments, the UK Overseas Territories, and Bloomberg Business News. Over the last few years Chuck has provided exclusive insights in to the potential impact of storms on energy infrastructure here at The Oil Drum, and this year will be joining us as a contributor to help assess the impact storms may have on our energy infrastructure. - Gail*

We now have our first serious threat to the Gulf of Mexico this year, in the form of Tropical Depression 1 (TD #1). The current official forecast is for the storm to hit the Yucatan Peninsula and, if it survives, cross the Bay of Campeche and strike the coast again near the Mexico/Texas border. Some of the more advanced computer models are showing that the system may make a more northward turn and become a strong tropical storm or hurricane after passing over Yucatan, potentially impacting the area of the Deepwater Horizon response. I would caution here that forecasting weak systems is tricky, and track/forecast models have a poor track record on storms at this stage.

That said, here is a map of some of the computer models, as of late Friday afternoon (7pm ET), including the official forecast track in bright red. We should have a better handle on where the storm is going, and if there is serious potential to impact the Gulf production areas or DH spill response, over the weekend. As discussed below, if it turns and strengthens, it could be problematic for the DH response.



If the storm crosses Yucatan directly as per the official Forecast, it should have minimal impact on PEMEX. The waves might cause problems for the DH response, but it is too early to tell. Since we don't really know at this stage if the storm will be a serious threat, I will discuss in general the impact hurricanes have on production in the Gulf, what a storm might do to the oil spill (and vice versa!), what this year might have in store, and what kinds of info we'll try to post here during incoming storms.

*Note:* This overview of hurricanes and GOMEX oil/gas production is based on research by Dr. Mark Johnson of the University of Central Florida and myself. This year we will be posting comments on incoming storms, forecasts, and results of our ongoing work here at The Oil Drum as conditions warrant.

## Hurricanes and GOMEX Oil/Gas Production

Ever since offshore oil and gas production accelerated in the 1970s, hurricanes have been a factor. However, the rapid expansion of offshore production coincided with a period of lower hurricane activity resulting in part from a 20-30 year climate cycle known as the [Atlantic Multidecadal Oscillation](#) (AMO). If 2004's Hurricane Ivan was a wake up call, 2005's Katrina and Rita, combined with tight markets, were Mother Nature up-ending the bed and dumping us on the cold hard floor. We are now in a period of higher activity that is likely to last for another 5-10 years.

Hurricanes disrupt Oil/Gas production in two key ways: evacuation and actual damage. Offshore assets must be evacuated well in advance of an incoming storm. Precautionary shut-downs are made to prevent spills in the event platforms, rigs, and undersea pipelines are damaged. Thus, even if a storm completely misses the offshore assets, a storm in the Gulf can cause the loss of 3-5 days of production as crews shut down, evacuate, return, and restore production. Admiral Allen noted in a press conference today they would need to start shutting down the Deepwater Horizon operation 5 days before 34kt winds arrived, and it could take two weeks to resume operations. That seems excessive to me - 3 days evacuation, and 5-7 for recovery seems more in line with

historical disruptions, but given the complexity and ad hoc nature of the response equipment may well be true. If 5 days to evacuate number is accurate, this is a serious problem, since 5 day forecasts are notoriously unreliable and have a "cone of uncertainty" of over 300 nautical miles. AL93 is already less than 4 days out, according to some models.

The damage a storm will cause depends on many factors. Waves are a major factor. Older platforms had an air gap (the distance between the normal, static water surface and the base of the platform) of 35 ft to allow waves to pass under the platform. Over time that grew to 55 ft. But Ivan, Katrina, and Rita firmly demonstrated that these air gaps are too small. Chevron's Petronius platform was hit by a 90ft wave in Ivan, and was shut down for six months. Another major problem is damage to the 33,000 mile network of pipelines that connects platforms with on-shore refineries. Undersea landslides, pressure damage, and damage to the infrastructure where the pipelines come onshore can cut off platforms for months. The high winds from a storm can strip off towers, cranes, and other superstructure from offshore assets.

Assets are generally built to withstand a 100 year event. However, that often results in a serious under-design of the entire system. While a 70 foot wave might be a 100 year event at any one point, it is only a 12 year event for at least one platform in the Gulf. Another issue is the harsh offshore environment. In effect these structures are sitting in a salt bath. Even with aggressive preventive maintenance, it is doubtful that a structure designed to handle a 120mph wind can still handle those loads after sitting in the Gulf for years or decades.

Restoration times are also a complex calculation. Some wells, especially older, nearshore assets, are simply not worth restoring as they are too far along in their production cycle to warrant the expense of repairing the damage. For major events like Katrina, another issue is the globally limited resources to replace damaged assets.

## 2010 Outlook

This doesn't look to be a good year for several reasons. First, we are still clearly in a warm phase AMO cycle, with the Atlantic sea surface temperatures above normal. Second, it is increasingly clear that we will be entering a La Nina phase of the [ENSO cycle](#) over the next few weeks. Thus, there will be more energy (SST) and favorable winds (La Nina). Historically, when those conditions exist, there is disruption to Gulf of Mexico (GOMEX) production. Our modeling indicates that 98% of years with climatology similar to this one will lose at least one week of production, as opposed to 40% of all years. On average, 98 million barrels of production are shut in in years like this one.

## Oil Spills and Hurricanes

There has been a lot of discussion about the impact of a hurricane on the spill, and vice versa. [Jeff Masters has a good discussion on the impact of oil on a storm topic here](#). As he points out, the size of the storm is large compared to the size of the slick. I agree that as far as the impact of the spill on storms, I seriously doubt it will be noticeable. In theory, an oil sheen should reduce the energy exchange between water and air, and reduce energy available, and therefore weaken a storm. Also in theory, some are arguing the oil will result in slightly higher SSTs, and therefore more energy and stronger storms. I think both arguments are of the "angels on pinheads" variety due to the size factor, and that wave and wind action will disrupt the slicks long before either process could come in to play.

The impact of a storm on the oil is whole different matter. I think the best thing the Gulf Coast

could get this year is a direct hit by a big, wet, Cat 1 storm. Strong enough to clean things out, not so bad as to hurt folks much worse than they already are. The currents and wave action would probably mix up and disperse the oil, rain bands and surge would flush out the wetlands without pushing oil much further inland. A worst case might be a mid or southern Gulf bypassing storm - winds, waves could push the oil on to and beyond protective devices as well as deeper in to the marshes, but not be violent enough to seriously mix up the oil and disperse it, and no rain bands to dilute or wash out the wetlands. A direct hit by a stronger storm could potentially push oil far inland, but the mixing and dilution effects should mitigate that somewhat.

Either way, given climatology, we're almost certainly going to find out what a hurricane does to an oil spill this year . . .



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