

From: Sam <samuel.arey@epfl.ch>
Sent: Tuesday, December 28, 2010 8:44 PM
To: creddy@whoi.edu
Subject: Re: update; please read

Chris,

I hope I was not too blunt with Rich. I do not want to make bad blood with him or anyone. I am concerned that we have 48 hours to decide everything and there is not really time to debate anymore. At the end of the day, I need to be clear that I'm not going to put my name on the ms with this extrapolation.

I do not have strong feelings about it but simply feel that it is a bad decision and would be bad science. I can't stand behind it. I'm sorry to be inflexible about it and I hope it doesn't make things too difficult. If you want, you can blame it on me. I don't mind taking the hit for this one. I just have to stand for what I believe on it. I hope it will be cool.

In case it is any consolation, I explained the whole thing to Pete Huybers. He came to same conclusion. He said he would not be willing to be a co-author on an extrapolation like that. Pete even explained to me further reasons that this would be a bad idea, from a statistical standpoint, which I didn't include in my previous email. (I didn't completely understand what Pete said but I understand that it makes things even worse than I thought.)

We can always point out that the correlation exists. If someone else wants to draw the line and point to the intercept between 1640 and 55700, they can do it. Let them stand behind it, but not me.

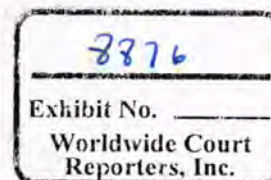
Let me know if things are cool.

Sam

On 12/28/10 3:44 PM, creddy@whoi.edu wrote:

> hi sam
>
> thanks for your comments. I think we just want to be clear that we are not in it
> to screw anybody. This is good discussion and the type of work done now that
> will help us later in the review stage.
>
> The draft is going to Jeff who will have his own comments. I believe that there
> are few things to note
>
> 1. This is not our data. we are just using what is available to us. this was far
> from a planned experiment and a national disaster.
>
> 2. I am not comfortable with having that many significant figures or even error
> bars on the intercept but could handle something, with a ton of caveats such
> linearity or unknowns, like ~50 to 70K barrels/day etc.
>
> yours,
> chris
>
>
>
> Quoting Sam<samuel.arey@epfl.ch>:

CONFIDENTIAL



WHOI-101813

>
 >> Rich, Chris, Jeff.
 >>
 >> I am ok with most of Rich's inserted text, plus or minus a couple of
 >> stylistic suggestions.
 >>
 >> However from my point of view, the following paragraph needs to be
 >> discussed:
 >>
 >> "Further analysis of these GOR trends as a function of oil collection
 >> rate indicate weak linear correlations (r^2 values ranging from 0.1 to
 >> 0.5) with similar negative slope values but differing offsets. A
 >> comparison of data from the top hat #4 collection device (i.e.,
 >> Discoverer Enterprise GOR trends and IGT-8 GOR), display a trend slope
 >> intercept at a theoretical maximum oil collection rate of approximately
 >> 57,000 barrels of oil per day (BOPD) $\pm 8,700$ BOPD (calculated as the
 >> root mean square deviation from GOR trend). This GOR-derived range is
 >> consistent with the Department of Energy's July 14, 2010 estimated flow
 >> rate of 52,700 BOPD [cite Presidential commission], as well as an
 >> optical velocimetry estimated flow rate of $55,900 \pm 11,700$ BOPD [Crone
 >> and Tolstoy 2010]."
 >>
 >>
 >> Since our submission deadline is drawing very close, let me cut to the
 >> chase.
 >>
 >> (1) I am in agreement with Rich that the weak r^2 values for GOR vs oil
 >> collection rate are statistically non-zero. I.e. the weak correlation is
 >> "real", not just noise. So this statement is ok with me.
 >>
 >> (2) The text then suggests that by extrapolating this trend to the
 >> intercept with the IGT-8 GOR (1640), the resulting total Macondo oil
 >> production rate (57000) can be estimated. I'm unwilling to support this
 >> statement, for the reasons summarized below.
 >>
 >> (a) We have no physical relationship which indicates that these two
 >> quantities (GOR measured at the surface and oil production rate at the
 >> surface) should be linearly related or even correlated at all. Thus we
 >> are left with ONLY statistics, and weak statistics at that.
 >>
 >> (b) The extrapolated line goes far outside of the cloud of data points.
 >> Given that the only support for this relationship is a very weak
 >> statistical correlation, we really do not have the basis to assume a
 >> linear relationship. Even if the relationship was supported by "strong"
 >> statistics, it would be questionable to extrapolate this line so far
 >> outside the data.
 >>
 >> (c) Even if we would accept that there is a legitimate relationship, and
 >> that the relationship is linear (which I think we cannot), the
 >> uncertainty propagation puts us outside of a meaningful result. I
 >> propagated uncertainty using bootstrap, in which I made generous
 >> assumptions. For example I propagated the uncertainty in only the slope
 >> of the regression and I did not include the uncertainty in the floated
 >> coefficient (y-intercept). This uncertainty propagation indicated that
 >> the extrapolated intercept with GOR 1640 has a huge uncertainty. At the
 >> 1-sigma confidence interval, the extrapolated total oil production rate
 >> ranges from 33000 to 330000, an order of magnitude. If we want to be
 >> serious, we should report the 2-sigma (95%) confidence interval, which
 >> is actually unbounded. The upper bound of the 2-sigma confidence
 >> interval is a positive slope, indicating total model failure -- in other
 >> words the line does not intercept with the GOR 1640 at all, except in
 >> the wrong direction. This would be like saying that the extrapolated
 >> total production rate is infinity -- as an upper bound. It makes no sense.
 >>
 >> (d) If we wanted to be serious, we would account for uncertainty in the

>> data, which would indicate that the regression is further biased. (I
>> talked to Pete about this.)
>>
>> (e) I think that including this kind of statement really risks to
>> totally undermine the beautiful work that Rich and other scientists have
>> done so far to estimate the total oil production rate from the Macondo
>> well. You have done excellent work and BP is painted into a corner. Now
>> let your work do it's job. BP is screwed. This proposed regression could
>> be so easily attacked in so many ways -- it would be handing BP a huge
>> advantage in their misinformation campaign.
>>
>> I apologize to be so blunt. We're running out of time.
>>
>> The bottom line is that I'm willing to support a statement that says
>> there is a weak correlation between GOR at the surface and oil
>> production rate at the surface, because the statistics support this. I
>> cannot support an extrapolation to a "meaningful" intercept of 55700
>> barrels per day total production rate. This is meaningless.
>>
>> Call me if you need.
>>
>> Sam
>>
>>
>> On 12/28/10 11:30 AM, creddy@whoi.edu wrote:
>> Hi Rich
>>>
>>> nice french. Thanks for the comments. I will let Rich and Sam comment first
>> on
>>> the pink comments..
>>>
>>> Lets get these comments rolling and so these sections are completed. I am
>>> looking to hear
>>>
>>> 1. I am cool with Rich's comments
>>>
>>> 2. I am cool with Rich's comments but can we edit this a bit by doing the
>>> following.
>>>
>>> 3. I am nervous about something and suggest the following.
>>>
>>> Please note that Rich deleted the figures so that he could email the text.
>> You
>>> can see them if you want.
>>>
>>>
>>> See you tomorrow Rich!
>>>
>>> Yours
>>> chris
>>>
>>> Quoting rcamilli@whoi.edu:
>>>
>>>> Gents,
>>>>
>>>> Here are my edits, sans figures and highlighted in pink -c'est comme ma
>>> vie
>>>> en
>>>> rose. I noticed that there are some poorly defined pronouns (us, we, our),
>>> so
>>>> a
>>>> stylistic edit is probably still required.
>>>>
>>>> Cheers,

>>>> Rich
>>
>