

64633640-51732-16602-134-245

From: Marcia K McNutt <mcnutt@usgs.gov>
Sent: Wed, 4 Aug 2010 15:07:33
To: GS FOIA 0105 <foia0105@usgs.gov>
Subject: Fw: UPDATE

Dr. Marcia McNutt
Director
US Geological Survey
12201 Sunrise Valley Drive, MS 100
Reston, VA 20192
(703) 648-7411
(703) 648-4454 (fax)
(571) 296-6730 (cell)
mcnutt@usgs.gov
www.usgs.gov

----- Forwarded by Janet N Arneson/DO/USGS/DOI on 08/04/2010 03:06 PM -----

From: "wereley, Steven T." <wereley@purdue.edu>

To: Franklin Shaffer <Franklin.Shaffer@NETL.DOE.GOV>, ira leifer
<ira.leifer@bubbleology.com>

Cc: Poojitha Yapa <pdy@clarkson.edu>, "pete@gso.uri.edu"
<pete@gso.uri.edu>, Lori Caramanian <Lori_Caramanian@ios.doi.gov>, Paul Bommer
<pmbommer@mail.utexas.edu>, Peter Cornillon <pcornillon@me.com>,
"savvas@newton.berkeley.edu" <Savvas@newton.berkeley.edu>, "Pedro I.

Espina" <pedro.espina@nist.gov>, "Bill.Lehr@noaa.gov"
<Bill.Lehr@noaa.gov>, Alberto Aliseda <aaliseda@u.washington.edu>, James J Riley

64633640-51732-16602-134-245
<rileyj@u.washington.edu>, Juan Lasheras <lasheras@ucsd.edu>, Marcia K
McNutt <mcnutt@usgs.gov>

Date: 05/25/2010 09:58 AM

Subject: RE: UPDATE

Frank, the way I see this is that we can come up with a lower bound for the discharge rate of the oil based on the velocity of the outer turbulent structures. Certainly that lower bound could be refined by comparison with an CFD or laboratory-based PIV analysis of a buoyant plume. We could probably do this correction pretty quickly by comparing with someone's already existing buoyant plume paper. I can't point our group to a particular paper, but there are scads of them in this area...

Steve Wereley, Professor of Mechanical Engineering
Birck Nanotechnology Center, Room 2019, 1205 West State Street
Purdue University
West Lafayette, IN 47907
phone: 765/494-5624, fax: 765/494-0539
web page: <http://engineering.purdue.edu/~wereley>

-----Original Message-----

From: Franklin Shaffer [mailto:Franklin.Shaffer@NETL.DOE.GOV]

64633640-51732-16602-134-245

Sent: Tuesday, May 25, 2010 9:53 AM

To: ira leifer; wereley, Steven T.

Cc: Poojitha Yapa; pete@gso.uri.edu; Lori Caramanian; Paul Bommer; Peter Cornillon; savas@newton.berkeley.edu; Pedro I. Espina; Bill.Lehr@noaa.gov; Alberto Aliseda; James J Riley; Juan Lasheras; Marcia K McNutt

Subject: RE: UPDATE

We should keep in mind that this is not conventional PIV. We are not tracking small particles that have been added to the flow field and that follow the highest velocity gradients of the flow field. From what I can see in the videos, we should be able to track features in the jets at locations a few jet diameters downstream. But we should be careful about what features we're tracking. What I see at the outside of the jet are features that look like turbulent eddies. These eddies may be moving at velocities much lower than velocities inside the jet. What we really need to do is match these features with CFD simulations of an oil/methane jet flow, then use the CFD simulations to come up with a prediction of total leak rates.

Frank

>>> "wereley, Steven T." <wereley@purdue.edu> 5/25/2010 9:29 AM >>>

Let's go with 10 consecutive frames then. That was about the minimum number I found to get solid measurements with the old low resolution images.

Steve Wereley, Professor of Mechanical Engineering

Birck Nanotechnology Center, Room 2019, 1205 West State Street

Purdue University

West Lafayette, IN 47907

phone: 765/494-5624, fax: 765/494-0539

web page: <http://engineering.purdue.edu/~wereley>

64633640-51732-16602-134-245

From: ira leifer [mailto:ira.leifer@bubbleology.com]
Sent: Tuesday, May 25, 2010 9:25 AM
To: Wereley, Steven T.
Cc: Peter Cornillon; Marcia K McNutt; Franklin Shaffer; Alberto Aliseda;
Bill.Lehr@noaa.gov; Juan Lasheras; Lori Caramanian; Poojitha Yapa; Pedro I.
Espina; pete@gso.uri.edu; Paul Bommer; James J Riley;
savas@newton.berkeley.edu
Subject: Re: UPDATE

Hi Steve,

I would recommend at least four frames as two would not allow errant velocity vectors to be identified based on time sequence filtering.

-ira

On May 25, 2010, at 6:22 AM, Wereley, Steven T. wrote:

Peter, I like the browse edition idea. I would suggest this, 2-10 consecutive high resolution frames be pulled from the day long video stream every minute. Then we could run a PIV analysis over a whole day and plot the temporal fluctuation. The reason for the 2-10 frames is that 2 is the minimum for the PIV analysis and considerably more is necessary to get a "nice" vector field.

Of course, one thing that might make this impractical is that the ROV may be repositioned during the run of this day long video.

Steve Wereley, Professor of Mechanical Engineering

64633640-51732-16602-134-245

Birck Nanotechnology Center, Room 2019, 1205 West State Street
Purdue University
West Lafayette, IN 47907
phone: 765/494-5624, fax: 765/494-0539
web page: <http://engineering.purdue.edu/~wereley>

From: pcornillon@me.com<<mailto:pcornillon@me.com>> [
<mailto:pcornillon@gmail.com>] On Behalf Of Peter Cornillon
Sent: Tuesday, May 25, 2010 8:59 AM
To: Marcia K McNutt
Cc: Franklin Shaffer; Alberto Aliseda; Bill.Lehr@noaa.gov<
<mailto:Bill.Lehr@noaa.gov>>; ira leifer; Juan Lasheras; Lori Caramanian;
Poojitha Yapa; Pedro I. Espina; pete@gso.uri.edu<<mailto:pete@gso.uri.edu>>;
Paul Bommer; James J Riley; savas@newton.berkeley.edu<
<mailto:savas@newton.berkeley.edu>>; Wereley, Steven T.
Subject: Re: UPDATE

On May 25, 2010, at 8:49 AM, Marcia K McNutt wrote:

Couldn't agree more, Frank. And you are right. This isn't high tech stuff. But the guys out on the oil platform who extracted the video are a bunch of roughnecks and the expertise of the engineers here at BP headquarters is in the area of hydraulics and heavy equipment. They don't know what they are doing. Bill made exactly the right call to grab all of the video so that you all can pick and choose what you want and make the call on what you want to analyze. There may be segments that aren't suitable for quantitative work but that can at least tell you whether the parts you did

select are representative.

In hindsight (which is always 20-20) a better way to approach this would have been to have someone from the team come here to view all of the files, bring in video editing equipment (since there isn't any here), and do the selection for the team yourselves. Would have been a lot faster. But this is second best, even though it caused delays that are very tragic. Was this approach ever requested, out of curiosity?

Steve Weverley suggested this approach a few days ago, well, as I recall he actually suggested going to the platform where we thought that the videos were stored.

On a related issue, yesterday I suggested producing a browse version of the entire video with the actual high resolution stream broken up into manageable segments that one could readily locate from the browse video and ftp from the archive. No one else commented on this suggestion. I'm a bit concerned with the implication of your comment above, Marcia, that one of us view the data stream and make a selection. I have no problem with someone on the team going through the entire sequence and suggesting a selection, but my guess is that others will want to see the selections made in the context of the available video.

Peter

Marcia

Dr. Marcia McNutt

64633640-51732-16602-134-245

Director

US Geological Survey

12201 Sunrise Valley Drive, MS 100

Reston, VA 20192

(703) 648-7411

(703) 648-4454 (fax)

(571) 296-6730 (cell)

mcnutt@usgs.gov<mailto:mcnutt@usgs.gov>

www.usgs.gov<x-msg://646/www.usgs.gov>

From:

"Franklin Shaffer" <Franklin.Shaffer@NETL.DOE.GOV<
mailto:Franklin.Shaffer@NETL.DOE.GOV>>

To:

"Marcia K McNutt" <mcnutt@usgs.gov<mailto:mcnutt@usgs.gov>>

Cc:

"ira leifer" <ira.leifer@bubbleology.com<mailto:ira.leifer@bubbleology.com
>>, "Poojitha Yapa" <pdy@clarkson.edu<mailto:pdy@clarkson.edu>>,
pete@gso.uri.edu<mailto:pete@gso.uri.edu>, "Lori Caramanian"
<Lori_Caramanian@ios.doi.gov<mailto:Lori_Caramanian@ios.doi.gov>>, "Paul
Bommer" <pmbommer@mail.utexas.edu<mailto:pmbommer@mail.utexas.edu>>, "Peter
Cornillon" <pcornillon@me.com<mailto:pcornillon@me.com>>,
"savas@newton.berkeley.edu<mailto:savas@newton.berkeley.edu>"
<Savas@newton.berkeley.edu<mailto:Savas@newton.berkeley.edu>>, "Pedro I.

64633640-51732-16602-134-245
Espina" <pedro.espina@nist.gov<mailto:pedro.espina@nist.gov>>, Bill.Lehr@noaa.gov<mailto:Bill.Lehr@noaa.gov>, "Steven Wereley T." <wereley@purdue.edu<mailto:wereley@purdue.edu>>, "Alberto Aliseda" <aaliseda@u.washington.edu<mailto:aaliseda@u.washington.edu>>, "James J Riley" <rileyj@u.washington.edu<mailto:rileyj@u.washington.edu>>, "Juan Lasheras" <lsheras@ucsd.edu<mailto:lsheras@ucsd.edu>>

Date:

05/25/2010 07:49 AM

Subject:

Re: UPDATE

Martha and Team,

I agree with the process Bill has chosen -- having the entire hard drives sent to him overnight. I just wanted to make two points. First that handling and editing this kind of video is not something new. We're not pushing the state-of-the-art. It's done all the time in the video industry. So it's just a matter of getting the right off-the-shelf equipment and expertise. I have been involved with some of the fastest high speed cameras that produce huge amounts of data, so I have an idea of what is available for data transfer and editing. The second point is that we need to have video samples long enough to account for flow rate variation. I'm new to the team, so perhaps this has been discussed already.

64633640-51732-16602-134-245

But again, I agree that Bill is doing the right thing -- getting all of the video into our hands.

Thanks,
Frank

>>> "Marcia K McNutt" <mcnutt@usgs.gov<mailto:mcnutt@usgs.gov>> 5/24/2010

7:08 PM >>>

Frank -

All I can say is that the last time BP extracted a subset of the video from a larger file, the quality was not acceptable to this team because in the process the file was rewritten to lower resolution. So I told them thanks but no thanks. They don't know what they are doing. They offered to get professionals in to do it, but Bill decided he would rather be in charge. Good call.

Marcia

Dr. Marcia McNutt

Director

US Geological Survey

12201 Sunrise Valley Drive, MS 100

Reston, VA 20192

(703) 648-7411

(703) 648-4454 (fax)

(571) 296-6730 (cell)

mcnutt@usgs.gov<mailto:mcnutt@usgs.gov>

www.usgs.gov<x-msg://646/www.usgs.gov>

64633640-51732-16602-134-245

From:

"Franklin Shaffer" <Franklin.Shaffer@NETL.DOE.GOV<
mailto:Franklin.Shaffer@NETL.DOE.GOV>>

To:

"Peter Cornillon" <pcornillon@me.com<mailto:pcornillon@me.com>>,
Bill.Lehr@noaa.gov<mailto:Bill.Lehr@noaa.gov>

Cc:

"ira leifer" <ira.leifer@bubbleology.com<mailto:ira.leifer@bubbleology.com
>>, "Poojitha Yapa"
<pdy@clarkson.edu<mailto:pdy@clarkson.edu>>, pete@gso.uri.edu<
mailto:pete@gso.uri.edu>, "Lori Caramanian"
<Lori_Caramanian@ios.doi.gov<mailto:Lori_Caramanian@ios.doi.gov>>, "Paul
Bommer" <pmbommer@mail.utexas.edu<mailto:pmbommer@mail.utexas.edu>>,
"savvas@newton.berkeley.edu<mailto:savvas@newton.berkeley.edu>"
<Savvas@newton.berkeley.edu<mailto:Savvas@newton.berkeley.edu>>, "Pedro I.
Espina"
<pedro.espina@nist.gov<mailto:pedro.espina@nist.gov>>, "Steven Wereley T."
<wereley@purdue.edu<mailto:wereley@purdue.edu>>,
"Alberto Aliseda" <aaliseda@u.washington.edu<
mailto:aaliseda@u.washington.edu>>, "James J Riley"
<rileyj@u.washington.edu<mailto:rileyj@u.washington.edu>>, "Juan Lasheras"
<lsheras@ucsd.edu<mailto:lsheras@ucsd.edu>>, "Marcia K
McNutt" <mcnutt@usgs.gov<mailto:mcnutt@usgs.gov>>

Date:

05/24/2010 06:45 PM

Subject:

Re: UPDATE

How much does the flow rate of these leaks vary in magnitude and with

time? If the flow rate does not vary considerably, then we don't need long excerpts of the video. We only need excerpts that are long enough to cover a few periods of the largest variations in flow rate.

Someone from our team should be able to review a continuous, unedited video over a length of time greater than the largest variations in the leak rate. Then they can decide how long the excerpts we work with need to be. And they can pick out some excerpts that are of the best image quality.

I work with very large high speed videos all the time. If a camera is generating a large video feed, then certainly off-the-shelf equipment exists to review, edit, and extract excerpts of the large video feed. 1600 x 1200 at 25 frames per second is not something really unusual in the world of video equipment. My high speed camera (Vision Research v12) generates 1280 x 800 images at 7000 frames per second, and I have no problem working with and distributing the video files.

Frank

>>> "Bill Lehr" <Bill.Lehr@noaa.gov<mailto:Bill.Lehr@noaa.gov>> 5/24/2010 6:15 PM >>>

Our guys will do whatever the team wants.

On 5/24/10 2:45 PM, Peter Cornillon wrote:

> Bill,

>

> I wonder if it would be useful for your editing guys:

>

> 1) To make a low quality subsampled video, e.g., one frame a second or
> one frame every few seconds, and

64633640-51732-16602-134-245

>

> 2) To break the high quality video into say 5 minute segments.

>

> We could then use the low quality video to collectively choose one or
> two reference times that everyone would use for a first estimate, and
> then, assuming that we have good agreement between the groups, we
> could choose a suite of times to sample and divide them up among the
> different groups to get a sense for how the flux varies in time.

>

> I'm assuming that the full resolution, high quality videos (2 above)
> can be saved in such a way that one can easily identify and download
> the segments of interest from the browse video. Note that this will
> not preclude looking at sections of the high quality video in the
> initial selection phase.

>

> Given that the file is too large to FTP to Seattle, it seems that we
> need to have a plan in place to efficiently select and acquire the
> segments of interest once they have been transferred. I've offered
> one alternative for doing this above. Another alternative is to have
> someone at Seattle do the subsampling/selection, but my guess is that
> the group will quickly find that they want more. Furthermore, we do
> not have the context that would have if we had a browse video.

>

> What do the rest of you think about this?

>

> Peter

>

>

> On May 24, 2010, at 4:55 PM, Marcia K McNutt wrote:

>

>>

>> Right. The problem is that the workclass ROVs record their data in

>> one large file. No EOFs during the deployments, which can last for
>> more than a day. When BP tried before to use simple tools to extract
>> segments of video from these huge files, they ended up degrading the
>> quality such that it wasn't useful for scientific analysis. Not
>> wanting to do that again, they left the entire file intact, and just
>> provided the video time codes for the sections that would be the best
>> for analysis thinking that people could just fast forward to those
>> places. However, the file itself is too large to FTP to Seattle.

>>

>> BP offered to get a professional video editing company in this
>> evening to edit out the sections that were selected and then FTP
>> those short sections, but Bill decided it would be better to just Fed
>> Ex the disk overnight to him in Seattle and let his folks there do
>> the job. That way he will have all of the data and can choose what
>> looks best.

>>

>> Another setback. Sigh :(

>>

>> Marcia

>> *****

>> Dr. Marcia McNutt

>> Director

>> US Geological Survey

>> 12201 Sunrise Valley Drive, MS 100

>> Reston, VA 20192

>> (703) 648-7411

>> (703) 648-4454 (fax)

>> (571) 296-6730 (cell)

>> mcnutt@usgs.gov<mailto:mcnutt@usgs.gov> <mailto:mcnutt@usgs.gov>

>> www.usgs.gov<x-msg://646/www.usgs.gov> <x-msg://529/www.usgs.gov>

>> *****

64633640-51732-16602-134-245

>>

>>

>> From: Bill Lehr <Bill.Lehr@noaa.gov<

mailto:Bill.Lehr@noaa.gov> <

mailto:Bill.Lehr@noaa.gov>>

>> To: Ira Leifer <ira.leifer@bubbleology.com<

mailto:ira.leifer@bubbleology.com>

>> <mailto:ira.leifer@bubbleology.com>>, "pete@gso.uri.edu<

mailto:pete@gso.uri.edu>

>> <mailto:pete@gso.uri.edu>" <pete@gso.uri.edu<mailto:pete@gso.uri.edu>

>> <mailto:pete@gso.uri.edu>>, "Espina, Pedro I." <pedro.espina@nist.gov<

mailto:pedro.espina@nist.gov>

>> <mailto:pedro.espina@nist.gov>>, Juan Lasheras <lsheras@ucsd.edu<

mailto:lsheras@ucsd.edu>

>> <mailto:lsheras@ucsd.edu>>, Alberto Aliseda

>> <aaliseda@u.washington.edu<mailto:aaliseda@u.washington.edu> <

mailto:aaliseda@u.washington.edu>>,<

>> Poojitha Yapa <pdy@clarkson.edu<mailto:pdy@clarkson.edu> <

mailto:pdy@clarkson.edu>>,< James J

>> Riley <rileyj@u.washington.edu<mailto:rileyj@u.washington.edu> <

mailto:rileyj@u.washington.edu>>,<

>> Paul Bommer <pmbommer@mail.utexas.edu<mailto:pmbommer@mail.utexas.edu>

>> <mailto:pmbommer@mail.utexas.edu>>,"Savas@newton.berkeley.edu<

mailto:Savas@newton.berkeley.edu>

>> <mailto:Savas@newton.berkeley.edu>" <Savas@newton.berkeley.edu<

mailto:Savas@newton.berkeley.edu>

>> <mailto:Savas@newton.berkeley.edu>>,"wereley@purdue.edu<

mailto:wereley@purdue.edu>

>> <mailto:wereley@purdue.edu>" <wereley@purdue.edu<

mailto:wereley@purdue.edu>

>> <mailto:wereley@purdue.edu>>,< Franklin Shaffer

>> <Franklin.Shaffer@NETL.DOE.GOV<mailto:Franklin.Shaffer@NETL.DOE.GOV> <

64633640-51732-16602-134-245

mailto:Franklin.Shaffer@NETL.DOE.GOV>>

>> Cc: Marcia K McNutt <mcnutt@usgs.gov<mailto:mcnutt@usgs.gov> <
mailto:mcnutt@usgs.gov

>>

>> Date: 05/24/2010 04:41 PM

>> Subject: UPDATE

>>

>>

>>

>>

>>

>>

>> Apparently the video data is contained on a hard drive with other clips
>> that are not useful and the BP folks in the Gulf do not have editing
>> capability on site. Dr. McNutt is arranging for the hard drive to be
>> fedexed to NOAA-Seattle where we have staff from some of our sister
>> groups who can edit it for us.

>>

>> In the meantime, how is the analysis going on the smaller leak? Anybody
>> have any numbers yet?

>>

>>

>

> --

> Peter Cornillon

> 215 South Ferry Road

Telephone:

> (401) 874-6283

> Graduate School of Oceanography

Fax: (401)

> 874-6283

> University of Rhode Island

64633640-51732-16602-134-245
> Internet: pcornillon@gso.uri.edu<mailto:pcornillon@gso.uri.edu> <
mailto:pcornillon@gso.uri.edu>
> Narragansett, RI 02882 USA
>
>

--

Peter Cornillon

215 South Ferry Road
874-6283

Graduate School of Oceanography
874-6283

University of Rhode Island
pcornillon@gso.uri.edu<mailto:pcornillon@gso.uri.edu>
Narragansett, RI 02882 USA

Telephone: (401)

Fax: (401)

Internet:

<:}}}}}}>< * <:}}}}}}>< * <:}}}}}}><

Marine Sciences Institute
University of California
Santa Barbara, CA 93106-5080 USA
(805)893-4931 (Tel)

64633640-51732-16602-134-245

<http://www.bubbleology.com>

OFF CAMPUS OFFICE - Preferred for ship/Fax/mail

6740 Cortona Dr, UCSB Engineering Research Center
Ocean Engineering Laboratory,

Goleta CA 93117

Fax (805)893 4927

<:}}}}}> * <:}}}}}> * <:}}}}}>