Claus Hansen
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3. maj 2016

**Kære Claus Hansen**

Ved mail af 20. marts 2016 til Energi-, Forsynings- og Klimaministeriet har du tilkendegivet, at du ønsker aktindsigt i al korrespondance mellem GEUS og Dennis Helsel, så snart den artikel korrespondancen vedrører, er publiceret.

Artiklen er nu publiceret, og GEUS har derfor taget fornyet stilling til din anmodning aktindsigt.

Reglerne om aktindsigt
GEUS har behandlet din anmodning på grundlag af miljøoplysningslovens, jf. lovbekendtgørelse nr. 606 af 14. juni 2006. Det følger af lovens § 2, stk. 1, og § 6, stk. 2, at retten til aktindsigt med visse undtagelser følger reglerne i den gamle offentlighedslov fra 1985. Efter miljøoplysningslovens § 2, stk. 3, 1. pkt., skal der foretages en konkret afvejning af offentlighedens interesse i en udlevering over for de interesser, der varetages ved at afslå udlevering. Endvidere følger det af § 2, stk. 3, 2. pkt., at undtagelser fra aktindsigt skal anvendes restriktivt.

GEUS har også behandlet din anmodning på grundlag af den nye offentlighedslov, jf. lov nr. 660 af 13. juni 2013, og vurderet om denne lovs bestemmelser giver dig en bedre retsstilling.

Afgørelse
GEUS kan delvist imødekomme din anmodning om aktindsigt i korrespondancen med Dennis Helsel. Selve korrespondancen er således vedlagt, mens udkast til artiklen, som har været vedhæftet korrespondancen undtages.

Foruden udkast til artiklen, har følgende været vedhæftet korrespondancen:

1. En artikel, som du selv har forfattet
2. Vandrammedirektivet

GEUS
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*GEUS er en forsknings- og rådgivningsinstitution i Energi-, Forsynings- og Klimaministeriet*

3. En Zip-fil modtaget fra Dennis Helsel, med tidligere artikler, som han har skrevet.

For god ordens skyld kan det oplyses, at Vandrammedirektivet er offentligt tilgængeligt på http://eur-lex.europa.eu/legal-content/DA/TXT/PDF/?uri=CELEX:02000L0060-20140101&qid=1413285809481&from=DA.

Ovennævnte zip-fil er ikke vedlagt, da den ikke kan åbnes. Den var beskadiget ved modtagelsen, og har aldrig været åbnet eller genfremsendt. Den har således ikke haft betydning.

Nedenfor kan du læse begrundelsen for afgørelsen:

De undtagne artikeludkast vedrører foreløbige forskningsresultater. Den gamle offentlighedslovs undtagelsesbestemmelser kan efter omstændighederne anvendes til beskyttelse af sådanne forskningsresultater, som endnu er foreløbige. Hjemlen til at afslå aktindsigt i sådanne resultater findes i den gamle offentlighedslovs § 13, stk. 1, nr. 6, jf. miljøoplysningslovens § 2, stk. 1.

Anvendelsen af offentlighedslovs § 13, stk. 1, nr. 6 er ikke i strid med bestemmelserne i artikel 4, stk. 2, i Europa-Parlamentets og Rådets direktiv 2003/4/EF af 28. januar 2003 om offentlig adgang til miljøoplysninger og om ophævelse af Rådets direktiv 90/313/EØF, idet beskyttelse af oplysninger af hensyn til forskningsmæssige interesser kan varetages, når der er tale om materiale under udarbejdelse (art. 4, stk. 3, litra c).

Hensynet til forskningsmæssige interesser gør sig gældende for dokumenterne i deres helhed. De pågældende artikeludkast indeholder således ikke ekstraheringspligtige oplysninger, jf. offentlighedslovens § 13, stk. 2.

GEUS har foretaget en konkret afvejning af offentlighedens interesse i en udlevering over for de interesser, der varetages ved at afslå udlevering. For udlevering af miljøoplysningerne taler offentlighedens og din væsentlige interesse i at få aktindsigt.

For afslag på udlevering af oplysninger kan anføres, at det er en væsentlig interesse at sikre de pågældende forskere rimelige arbejdsvilkår ved at beskytte dem mod en offentliggørelse af foreløbige forskningsresultater, som de ikke ønsker at give fra sig, fordi de ikke er færdigtbearbejdet og kvalitetssikret.

I afvejningen af disse modsatrettede hensyn er det GEUS' vurdering, at hensynet til beskyttelse af de pågældende forskeres interesse i det kon-

krete tilfælde er så tungtvejende, at offentlighedens og din interesse i udlevering af resultaterne må vige herfor.

GEUS har i den forbindelse lagt vægt på, at de endelige forskningsresultater er publiceret. Endvidere er der ikke er tale om oplysninger om emissioner, udledninger eller andre udslip i miljøet, som må antages særligt at have offentlighedens interesse.

GEUS har overvejet, om de undtagne oplysninger bør udleveres efter princippet om meroffentlighed, jf. den gamle offentlighedslov § 4, stk. 1, men har med samme begrundelse som anført oven for ikke fundet grundlag herfor.

Det bemærkes, at GEUS også har vurderet din aktindsigtsanmodning efter den nye offentlighedslov. Denne vurdering fører også til et afslag på aktindsigt. Der henvises herved til den nye offentlighedslovs § 33, nr. 4 og § 14. Det er ligefrem gjort mere tydeligt i den nye offentlighedslov, at hensynet til beskyttelse af foreløbige forskningsresultater kan begrunde en begrænsning i retten til aktindsigt.

Klagevejledning
Klage over denne afgørelse om aktindsigt kan ske til Energi-, forsynings- og Klimaministeriets departement. Du skal dog først sende din klage til GEUS. Hvis afgørelsen fastholdes, sender GEUS din klage samt sagens dokumenter til departementet snarest og som udgangspunkt senest syv hverdage efter modtagelsen af klagen, jf. offentlighedslovens § 37, stk. 1 og 2, og miljøoplysningslovens § 4 b.

Hvis du har spørgsmål er du velkommen til at kontakte undertegnede.

Ved eventuel fremtidig korrespondance bedes du anvende GEUS officielle e-mail adresse: geus@geus.dk. E-mail sendt til denne adresse journaliseres automatisk og besvares uafhængigt af enkelte medarbejderes fravær.

Kopi af denne skrivelse er sendt til Energi-, Forsynings- og Klimaministeriet.

Med venlig hilsen

Anne Merete Koefoed
Personalechef

Fra: Dennis R. Helsel [mailto:dhelsel@practicalstats.com]
Sendt: 8. januar 2016 16:53
Til: Johnsen, Anders Risbjerg
Cc: Larsen, Flemming; Sørensen, Lærke Thorling
Emne: Re: Hansen et al - letter to the editor

My apologies, I forgot to attach my changes!

Anders,
Here are my slight changes. The comment letter is very good. I've added the ending as requested, as well as my address. Thank you for inviting me to be a part of this, and I trust it will clear the confusion created by the article.

Dennis H.

Johnsen, Anders Risbjerg wrote:
> Dear Dennis.
>
> I have now written a draft for the revised reply to the Hansen et al
> paper.
>
> It is quite different from the first version. I look forward to your
> comments.
>
> Cheers,
>
> Anders
>
> ---
> - Anders R. Johnsen, senior researcher, ph.d.
> Geological Survey of Denmark and Greenland (GEUS) Department of
> Geochemistry Øster Voldgade 10, DK-1350 Copenhagen K, Denmark
> E-mail: arj@geus.dk <mailto:arj@geus.dk>
> Phone: +45 9133 3551
>

-- Dennis R. Helsel, Ph.D. Sign up for our newsletter at:
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Castle Rock, CO 80109 Twitter: @PracticalStats

Fra: Dennis R. Helsel [dhelsel@practicalstats.com]
Sendt: 23. december 2015 15:42
Til: Larsen, Flemming
Emne: Re: SV: SV: SV: SV: A question

Flemming,
Merry Christmas, and hope your trip to Myanmar goes well, whether it be work or personal. I'll look over the contribution when Anders sends it.

Dennis

Larsen, Flemming wrote:
> Dennis,
>
> The time is running fast and Christmas is here. I was too busy with administrative matters the last months of the year, and therefore I could not find the time to complete writing our comments to Hansen et al 2015.
> I will be in Myanmar the first two weeks of the coming year, and I have therefore asked one of the employed in my department Anders Johnsen to finish our contribution, and mail this to you in the beginning of the new year.
>
> I wish you a Merry Christmas and a Happy New year.
>
> Best wishes Flemming
>
>
> Flemming Larsen, Ph.D.
>
> Head of Geochemical Department
> Geological Survey of Denmark and Greenland Øster Voldgade 10
> 1350 Copenhagen K
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> Phone direct: +45 9133 3561
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> Forsynings- og Klimaministeriet GEUS er partner i Geocenter Danmark og
> tilknyttet EuroGeoSurveys
>
>
> -----Oprindelig meddelelse-----
> Fra: Dennis R. Helsel [mailto:dhelsel@practicalstats.com]
> Sendt: 11. november 2015 19:11
> Til: Larsen, Flemming
> Emne: Re: SV: SV: A question
>
> Flemming,
> I too have been traveling (Alaska) and will be away teaching a course

> this coming week in Minnesota. I don't have the time to conduct a new
> data analysis, but I don't think it is necessary or appropriate for a
> letter of response. I have attached a section describing the problem
> with MLE and why logistic regression is preferred. I have deleted my
> observations about the change in monitoring objectives I gathered from
> their paper, as you are certainly the expert in that regard. Add your
> sections on the monitoring objectives and other topics, and modify my
> point 3 to refer to your comments. Then send it to me as our first
> draft. I can look at it in the evenings next week even though I am
> not in my office. I am glad to co-author this with you as long as
> point 1 of my comments remains -- the deletion of nondetects is not
> the way that this type of work should be done. It is always good to
> agree with the author where possible when writing a comment, then
> point out the defic
iencies in their work.
>
> Best regards,
> Dennis
>
> Larsen, Flemming wrote:
>> Dear Dennis,
>>
>> I have been busy after my trip around Europe, but will now have time to write a comments to the Hansen et al paper with you.
>>
>> I will suggest a structure in the comment, where we address the overall monitoring strategy and then the comments to the specific statistic treatment presented in Hansen et al, and the alternative method (logistic regression), which you suggest in your mail.
>>
>> If you agree in this approach I will ask you to write a section in which you describe why the MLE method cannot be used in this case and how data can be handled used the logistic regression method. I can send you the raw data if you agree.
>>
>> I will then write about the overall monitoring strategy, combine our two contributions and mail a first draft of the comment to you.
>>
>> Let me hear you response to this plan.
>>
>> Best wishes
>>
>> Flemming
>>
>> -----Oprindelig meddelelse-----
>> Fra: Dennis R. Helsel [mailto:dhelsel@practicalstats.com]
>> Sendt: 14. oktober 2015 19:37
>> Til: Larsen, Flemming
>> Emne: Re: SV: SV: A question
>>
>> Flemming,

>> Thank you for the background on the EU directive. I had guessed as much about the changes in wells selected for sampling, based on the article.
>> If you would like to write a joint response, I am fine with that. I've attached a draft I wrote after fully reading the article. You'll see that it is similar to your comments. See especially point 3. I haven't yet added a statement about what could be done with data having 10% or fewer detections. I would suggest using logistic regression to test for a trend (it tests for a change in the percent that are detected, not in concentration itself) rather than MLE. It doesn't provide estimates of a median. MLE could be done with another distribution rather than a lognormal and its likely that with these few detects, multiple distributions are plausible, and provide different answers. But the lognormal is the one traditional used in water chemistry. It is better than ignoring the nondetects, but certainly confidence intervals should also be provided, and they will be wide.
>>
>> Let me know if you'd like to proceed with a joint response, or whether it seems best to you to let me speak to the statistical aspects and you address the details of the problems with throwing all available data together, as they did, in a separate response.
>>
>> Best regards,
>> Dennis
>>
>> Larsen, Flemming wrote:
>>> Dear Dennis,
>>>
>>> I have been in the field for some days, therefore this late reply.
>>>
>>> Let me give you some background information from the EU water Framework directive, which is enclosed this mail.
>>>
>>> As you see in Annex V (page 60 to 64), the monitoring program in the EU Water Framework directive is divided into a "Surveillance monitoring" and a" Operational monitoring". In aim of the Surveillance monitoring is to provide information for use in the assessment of long term trends both as a result of changes in natural conditions and through anthropogenic activities. In this assessment we included all data, and here an estimation of values below the detection limits is relevant.
>>>
>>> The aim of the operational monitoring is to establish the chemical status of the groundwater bodies or group of bodies determined as being at risk, and further to establish the presence of any long term anthropogenically induced upward trend in the concentration of pollutant (page 62). As the aim here is an assessment of groundwater bodies at risk, only data from boreholes which are affected by human activities are included in the statistics. (Only a few % of the samples contains pesticides).
>>>
>>> The paper by Hansen et al 2015 is mixing up the surveillance and the operational monitoring, and we will therefore claim that an estimation of values (or summary statistics) for concentrations in the parts of the aquifers, which has never been affected by the use of pesticides (the water is too old), is not relevant.
>>>
>>> Anyway, let's just for the sake of the science accept Hansen et al idea and use the MLE method.
>>>
>>> As I see it, the basic problem is the low numbers of samples above the detection limit compared to the high numbers of non-detects (Fig 2 in Hansen et al 2015). For bentazone, the fraction above the detection limit ranges from 10/829 to 25/509, and for glyphosate from 3/630 to 27/639. The high numbers of non-detects give rise to two concerns:
>>>

>>> 1: With such scarce data, it seems impossible to test whether the populations actually follow log-normal distributions, which is assumed in the Hansen paper. In fact, we know that they do not since a fraction of the samples should be assigned the value zero as some of the monitoring wells collect water that is older than the date when the two pesticides were released to the Danish market. However, we do not know the age of the water in each individual well.
>>>
>>> 2. If we accept that the data actually follow a log-normal distribution, we would need an indication of the reliability of the estimated medians of the log-data. Fig 2 gives 0,75 and 0,25 percentiles, but these values only describe the estimated log-normal distribution, they do not indicate the uncertainty of the estimates. To estimate the uncertainty of the log-normal fits, we would for instance need 95% confidence limits for each median estimate.
>>>
>>> I will like to hear your comments to these ideas.
>>>
>>> Thanks, and best wishes
>>>
>>> Flemming
>>>
>>>
>>> -----Oprindelig meddelelse-----
>>> Fra: Dennis R. Helsel [mailto:dhelsel@practicalstats.com]
>>> Sendt: 7. oktober 2015 18:33
>>> Til: Larsen, Flemming
>>> Emne: Re: SV: A question
>>>
>>> Dear Flemming,
>>> I would have to understand more completely what your comments would be before I could agree to jointly author a comment. I am not sure of what your suggested way forward is. I will consider writing a comment myself. I agree with most of what is in the Hansen et al paper. Not using data that are nondetects is a very bad idea, so their argument to use censored methods is quite correct. My statement to you yesterday was that there is no correct way to estimate a single number for a specific sample using these methods, which was your question to me.
>>> They are appropriate for estimating trends, or a mean or median, or the characteristics of a distribution. The methods do not estimate values for single samples.
>>>
>>> In Figure 2 the authors used coloring to show the estimated distribution of data from an MLE model. That is perfectly fine. They are not assigning a single number to a single observation. They are stating that collectively, assuming the data follow a certain distribution, the nondetects fall into the ranges visualized by the red colors. They trend line they show is perfectly fine, and is a much better representation of the trend in the data than is the line shown by using only detected values. The assumption they make is that given the detected values observed, and WITH NO OTHER INFORMATION FROM SCIENCE, the red areas are a good model for the concentrations measured as below the detection limit.
>>>
>>> My understanding of your argument is that GIVEN OTHER INFORMATION that is known (glyphosate was not used prior to a certain time) that many of the nondetects should be zero, not the low concentrations that the model proposes. That is not a statistical issue, but of science. I agree with them that the EU practice of ignoring and deleting nondetect values strongly biases all results. I agree that other knowledge must also be brought to light, and if there was no use of a chemical then concentrations for that chemical could very well have been zero, and a different model for the data should be preferred. For example, one could assume all nondetects are at zero concentration, if all nondetects come from waters

prior to the start of glyphosate use. That would make the median concentration zero, not the median of the detected values. Or the median could be listed as<0.01. But not the median of only detected values.
>>>
>>> So that is a first draft of a comment I would write, and I would be glad to do so. I'm not sure it is the same view that you have, and so if it differs, it might be less awkward to keep the comments separate, I would think. I am open to further discussion.
>>>
>>> Best regards,
>>> Dennis
>>>
>>> Larsen, Flemming wrote:
>>>> Dear Dennis,
>>>>
>>>> I have just re-thinking the idea of writing a comment to the Hansen et al 2015 paper. Maybe it will be a better idea to write this together. Will you be a co-author to on the comments, if we write a draft?
>>>>
>>>> Best wishes
>>>>
>>>> Flemming
>>>>
>>>> Flemming Larsen, Ph.D.
>>>>
>>>> Head of Geochemical Department
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>>>> og tilknyttet EuroGeoSurveys
>>>>
>>>>
>>>> -----Oprindelig meddelelse-----
>>>> Fra: Dennis R. Helsel [mailto:dhelsel@practicalstats.com]
>>>> Sendt: 6. oktober 2015 19:37
>>>> Til: Larsen, Flemming
>>>> Emne: Re: A question
>>>>
>>>> Dr. Larsen,
>>>> It is good to hear from you. I'm glad the 1990 paper was helpful.
>>>> There is much more recent information in my textbook "Statistics for Censored Data using Minitab and R", published by Wiley in 2012.
>>>> Censored data is the statistician's term for data that are below or above a threshold, such as a detection limit.
>>>>

>>>> In short, no statistical method can estimate what concentrations were in individual samples below the detection limit, whether MLE or other methods. The one exception is when there is a strong correlation between chemicals, such as sometimes occur among trace elements or organic compounds, and one chemical is used to estimate the concentration of another with regression or similar methods. MLE and alternate methods are used to estimate parameters such as the mean or median, but cannot estimate values for individual samples.
>>>>
>>>> Certainly with over 90% of data reported as nondetects, MLE is unsuitable for estimating individual chemical concentrations.
>>>>
>>>> For more detailed guidance after tomorrow, my book should be of additonal help. I've also attached a zip file with more recent papers I've written on the subject, though the textbook has the complete story.
>>>> I also provide training (I've presented workshops at universities in Stockholm and Helsinki in past years) if the Geological Survey were interested.
>>>>
>>>> Best regards,
>>>> Dennis Helsel
>>>>
>>>> Larsen, Flemming wrote:
>>>>> Dear college,
>>>>>
>>>>> With reference to your paper with the title "Less than obvious" (1990), I hope you can guide us in the use of the MLE method presented.
>>>>>
>>>>> My department at the Geological Survey of Denmark and Greenland, is leading the national groundwater monitoring program. We have a discussion with some researchers outside our institution, who claim that we are not evaluating our monitoring data regarding pesticides statistically correct.
>>>>>
>>>>> In the enclosed paper, which was recently published, the authors re-evaluated our data using the MLE method, with a references to your 1990 paper. As you can see in their figure 2, the portion of censored data is very high. For glyphosate in year 2000 it is (837-8)*100/837 = 99.04 %. As I read your 1990 paper, the very high uncertainty in the prediction of the lognormal distribution implies that this method is not suitable for an estimation of concentrations below the detection limit. As stated in your paper, it can only be used to estimate summary statistics. Do you agree?
>>>>>
>>>>> I will infer, that knowing these two pesticides have only been used for about 20 years, this justify the use of a distributional method with "fill-in" values of zero. Where we don´t find pesticides in the deeper parts of the aquifer, there is no reason to believe that the pesticides are present even in concentrations below detection limits. The travelling time to the deeper parts of the aquifers is more than 20 years.
>>>>>
>>>>> Would it be possible to get your guidance before tomorrow European time as we have a meeting here in Copenhagen regarding this matter?
>>>>>
>>>>> Best wishes
>>>>>
>>>>>
>>>>> Flemming Larsen, Ph.D.
>>>>>
>>>>> Head of Geochemical Department
>>>>> Geological Survey of Denmark and Greenland Øster Voldgade 10

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> --
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