

Eske Benn Thomsen - Implement Consulting Group

From: Eske Benn Thomsen - Implement Consulting Group
Sent: 12. september 2017 14:15
To: 'Anders Chr. Erichsen'; Karen Timmermann
Cc: Martin Enevoldsen - Implement Consulting Group
Subject: FW: Question to researchers

Importance: High

Kære Anders og Karen

Jeg videresender hermed et enkelt spørgsmål fra Peter Herman i panelet – se nedenfor.

Vil I være så behjælpelig med at svare på dette?

På forhånd tak,

VH

Eske Benn Thomsen
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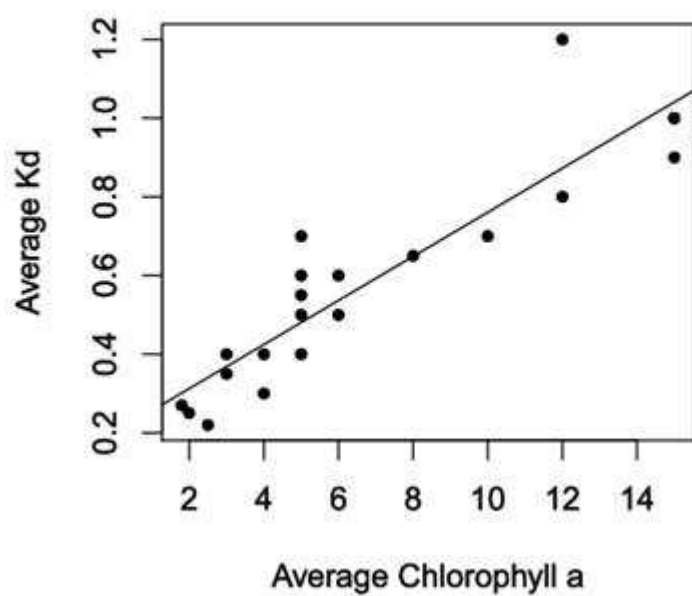
From: Peter Herman [<mailto:Peter.Herman@deltares.nl>]
Sent: 12. september 2017 11:53
To: Martin Enevoldsen - Implement Consulting Group
Subject: Question to researchers

I have observed, in the graphs presented in Appendix B of the scientific documentation report, that there is a correlation between the average Chl-a values and the average Kd values (averages over time), when analysed *cross-system*. To examine this, I estimated the averages by eye, and this is a rather... imprecise methodology. The graph is included in this mail.

Would it be possible to have the real averages of Chl-a and Kd for these systems? It would be embarrassing if it turned out the relation is not that strong at all but due to misestimation!

Thanks,

Peter Herman



Peter Herman

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Eske Benn Thomsen - Implement Consulting Group

From: Eske Benn Thomsen - Implement Consulting Group
Sent: 13. september 2017 16:11
To: 'Alice Newton'; 'Bo Gustafsson'; 'gerald.schernewski@io-warnemuende.de'; 'Peter Herman'; 'Malve Olli'
Cc: Martin Enevoldsen - Implement Consulting Group
Subject: FW: Question to researchers
Attachments: Chl_vs_kd_v20170913.xlsx

Enclosed you find the answer to Peter's question that was forwarded to the researchers.

BR Eske

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From: Karen Timmermann [<mailto:kt@bios.au.dk>]
Sent: 13. september 2017 16:07
To: Eske Benn Thomsen - Implement Consulting Group <esth@implement.dk>; Anders Chr. Erichsen <aer@dhigroup.com>
Cc: Martin Enevoldsen - Implement Consulting Group <mene@implement.dk>
Subject: RE: Question to researchers

Kære Eske,

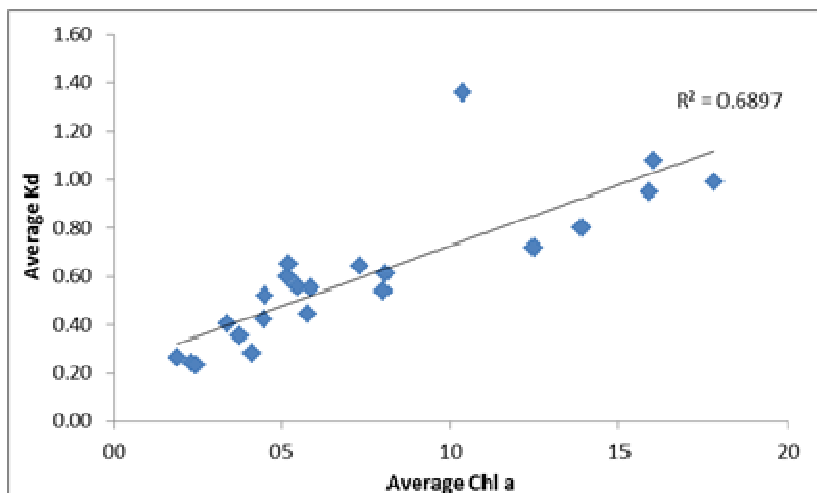
Her er de efterspurgte data – håber du kan videreformidle.

Pft, Karen

Dear Peter/Panel,

The data (calculated average from 1991 to 2012) of Chl a and Kd show essentially the same interesting pattern as observed by Peter Herman. Although the Kd values are higher than can be explained by the direct bio optical effects of chl a alone (chl a specific absorption coefficients are around 0.015 m² mg⁻¹ Chl a, Pedersen et al., 2014, Timmermann et al., 2010, Stæhr and Markager 2004), the rather convincing correlation indicates that there is a common factor governing both parameters. This could be phytoplankton primary production that over time cause an accumulation of organic matter both as POM and DOM which, together with Chl a adds to the light attenuation.

Also, the curve seems to be slightly non-linear as expected based on optical theory. Very beautiful!



Best regards Stiig, Jesper and Karen

*Karen Timmermann, Senior Scientist
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Department of Bioscience
Aarhus University
4000 Roskilde, Denmark
Tel direct +45 8715 8467*

From: Eske Benn Thomsen - Implement Consulting Group [<mailto:esth@implement.dk>]
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To: Anders Chr. Erichsen; Karen Timmermann
Cc: Martin Enevoldsen - Implement Consulting Group
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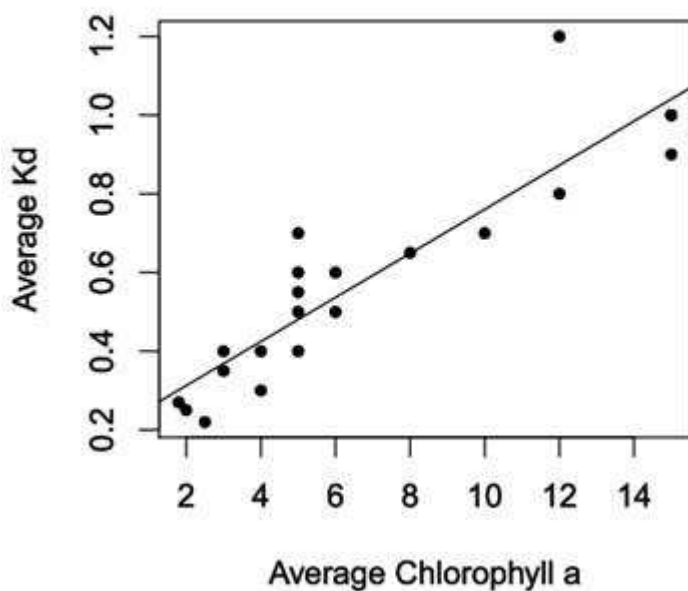
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To: Martin Enevoldsen - Implement Consulting Group
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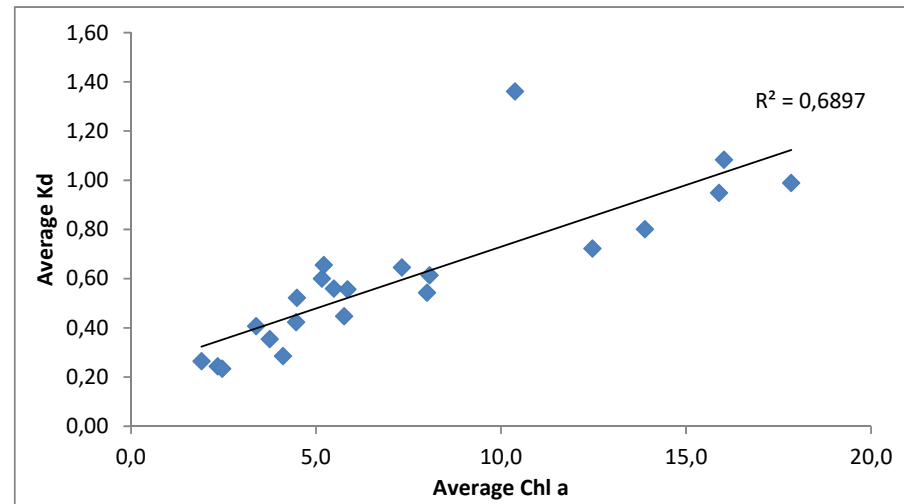


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AU og DHI's svar på Panelets spørgsmål

Chl,
average
1991-2012
[µg/l]
Kd, average
1991-2012
[m-1]

Åbenrå	15	3,7	0,35
Flensborg	KFF2	8,0	0,54
Horsens inder	5790	7,3	0,65
Horsens yder	6489	4,5	0,42
Kolding	3350	12,5	0,72
Vejle	5503	5,8	0,45
Randers inder	230902	16,0	1,08
Randers yder	230905	8,1	0,61
Kås	3705-1	5,5	0,56
Lovns	3728-1	17,8	0,99
Løgstør	3708-1	5,9	0,56
Nissum	3702-1	4,5	0,52
Riisgaarde	3726-1	13,9	0,80
Skive	3727-1	15,9	0,95
Isefjord	10003	3,4	0,41
Roskilde	60	5,2	0,60
Odense ydre	6900017	5,2	0,66
Odense indre	6910008	7,3	
Århus bugt	170006	1,9	0,26
Lillebælt	6100051	4,1	0,28
Storebælt	6700009	2,3	0,24
Ringkøbing	1	10,4	1,36
Storebælt	6700053	2,5	0,23



Eske Benn Thomsen - Implement Consulting Group

From: Eske Benn Thomsen - Implement Consulting Group
Sent: 14. september 2017 10:41
To: 'Karen Timmermann'; Anders Chr. Erichsen
Cc: Martin Enevoldsen - Implement Consulting Group
Subject: Yderlige spørgsmål fra Panelet

Kære Karen og Anders

Vi har fået følgende spørgsmål, som Panelet ønsker besvaret. Har I mulighed for det?

- 1) Has Kd been intercalibrated? "the importance of these indicators in the official ecological classification where only intercalibrated indicators are used"
- 2) Do you have one or a few typical time series for monitoring of Kd (preferably with high resolution) that you can send us?

Venlig hilsen

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From: Eske Benn Thomsen - Implement Consulting Group
Sent: 14. september 2017 16:40
To: 'Alice Newton'; 'Peter Herman'; 'Bo Gustafsson'; 'gerald.schernewski@io-warnemuende.de'; 'Malve Olli'
Cc: Martin Enevoldsen - Implement Consulting Group
Subject: FW: Yderlige spørgsmål fra Panelet
Attachments: kd_TimeSeries_st6900017.xlsx; Kd_TimeSeries_st6489.xlsx

The latest answers to your questions to the scientists

Eske Benn Thomsen
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From: Karen Timmermann [<mailto:kt@bios.au.dk>]
Sent: 14. september 2017 16:35
To: Eske Benn Thomsen - Implement Consulting Group <esth@implement.dk>; Anders Chr. Erichsen <aer@dhigroup.com>
Cc: Martin Enevoldsen - Implement Consulting Group <mene@implement.dk>
Subject: RE: Yderlige spørgsmål fra Panelet

Kære Eske,

Så lykkedes det at få data ud af databasen ☺ Vores svar er markeret med gult nedenfor.

Hilsen Karen

From: Eske Benn Thomsen - Implement Consulting Group [<mailto:esth@implement.dk>]
Sent: 14. september 2017 10:41
To: Karen Timmermann; Anders Chr. Erichsen
Cc: Martin Enevoldsen - Implement Consulting Group
Subject: Yderlige spørgsmål fra Panelet

Kære Karen og Anders

Vi har fået følgende spørgsmål, som Panelet ønsker besvaret. Har I mulighed for det?

1. Has Kd been intercalibrated? "the importance of these indicators in the official ecological classification where only intercalibrated indicators are used"

Answer: The Kd indicator has not been intercalibrated according to the WFD. As described in the report, the Kd indicator is used as a proxy for the indicator "eelgrass depth limit", which has been intercalibrated. Only intercalibrated indicators (i.e. eelgrass depth limit, summer chl concentration and the DKI) are used in the official assessment of ecological status of Danish WFD water bodies. Kd (or light availability) is very important for predicting potential eelgrass depth limit, but other factors may prevent or delay eelgrass recovery and hence an observable eelgrass depth limit may be lower than predicted by light availability.

2. Do you have one or a few typical time series for monitoring of K_d (preferably with high resolution) that you can send us?

Answer: Attached is two time series of K_d monitoring data from the Danish monitoring program (NOVANA). High frequency K_d data is often scattered due to e.g. resuspension event whereas the K_d level and long term trends will reflect the amount of substances that either absorb or scatter light - mainly organic matter (POM and DOM).

Venlig hilsen

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