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15 July 2012

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cc Caroline Spellman
Douglas Carswell
David Cameron
George Osborne

Dear Paul Leinster

I am writing to formally complain about the behaviour of Charles Beardall director of Anglian Region of EA.

As my communication with Charles Beardall involves SMP, IROPIs, Coastal Squeeze and ultimately climate change I shall talk about these things too, which will make the letter rather long.

There are a number of FOI/EIR requests throughout the letter.

I have cc'ed this letter to David Cameron and to Caroline Spellman as I believe Caroline Spellman has delegate the signing of IROPI's to DEFRA who have in turn delegated to EA. If this is true it is clearly wrong for an agency to be able to approve it's own plan.

I have also cc'ed this letter to David Cameron and George Osborne as there is no proper scientific evidence to support SMP or CO_2 based climate change. There is also a good deal of scientific evidence which clearly indicates there is no CO_2 based warming any warming which did occur was the result of temporary increase in solar output and decrease in cloud cover. This means SMP and any other climate change adjustment measures are both unecessary and a clossal waste of money. Just what is need in a financial crisis.

Charles Beardall

I have corresponded with Charles Beardall and his staff for over a year and have always found there answers cryptic, incomplete, evasive, or wrong. The communication was promted by EA plan to breach the sea wall at Devereux farm, Kirby-le-Soken, Essex near where I live.

The particular response which sparked this letter was Charles Beardall's response to an FOI/EIR request I made. Charles had said that the sea wall was vulnerable to erosion and this was the reason it was chosen for managed realignment.

Charles response was to quote from a mniute of the Regional Flood Defence Committee concerning approaches to policy decisions in the SMP.

> Section 11.9 attempted to capture the approach taken during SMP development to base decisions on likely future vulnerability/or existing defences. For completeness, it could have been clarified that there were two examples where landowners were supportive of progressing Managed Retreat for habitat creation purposes (Devereux Farm and Foulton Point). However, this was not stated at the meeting.

Now I might be picky but this clearly is not evidence of vulnerability to erosion.

This alone was the reason I am writing this letter.

Yet there's more I replied to Charles pointing out his response said nothing about erosion. I described how I had earlier talked to ICO about Natural England not providing adequate answers to FOI/EIR requests.

ICO had advised me on a form of words to use and I got a helpful response from NE (although it didn't include the evidence they claimed to have concerning Coastal Squeeze).

I used the same form of words when replying to Charles concerning lack of any evidence for vulnerability to erosion

> EA have stated sites for managed realignment were chosen on basis of vulnerability to erosion Will you please either
>
> a) confirm you have evidence that sites chosen were vulnerable to erosion (specifically the sea wall from Quay Lane to Titchmarsh Marina)
>
> b) deny it

Charles responded

> When a request has been made in general terms and it is difficult to determine what information the applicant actually wants, an authority does not have to disclose information.
> We have not been able to identify within your email a request that is specific enough to allow us to respond under FOI or EIR. The main question in your email appears to be
> EA have stated sites for managed realignment were chosen on basis of vulnerability to erosion/coastal processes
> Will you please either
>
> a) confirm you have evidence that sites chosen were vulnerable to erosion/coastal processes (specifically the sea wall from Quay Lane to Titchmarsh Marina)
>
> b) deny it
>
> We have not understood this to be a specific request for written information that we hold; it appears to be a question where you are seeking a yes or no answer. Could I ask you to please be specific about the information that you require in order that we can consider your request?

Whilst what Charles said may be literally true it is also sophistry. Why does EA reply in this fashion when NE can give a sensible response.

I just replied

> EA have stated sites for managed realignment were chosen on basis of vulnerability to erosion/coastal processes
> Will you please either
>
> a) confirm you have evidence that sites chosen were vulnerable to erosion/coastal processes (specifically the sea wall from Quay Lane to Titchmarsh Marina)
> AND SUPPLY A COPY OF THE EVIDENCE YOU HOLD WHICH LEAD YOU TO MAKE THIS CLAIM
>
> b) deny you hold evidence that sites chosen were vulnerable to erosion/coastal processes (specifically the sea wall from Quay Lane to Titchmarsh Marina) In which case will you explain why you made this claim

I suggest Charle's responses are silly, rude, unnecessary and a waste of time. Unless it is his nature to behave in this way the only reason for his behaviour is he has no evidence and is playing for time.

If there is no evidence is there any reason for the managed realigment at Devereux farm other than a willing landowner?

Charles replied to my last FOI request on 9 July saying

> ... Therefore, to be clear, we are confirming that, for Quay Lane to Titchmarsh Marina, we have not used evidence of vulnerability to inform the policy for this frontage. ...
> We do have information on our systems from previous asset inspections that relate to this site, however this information did not feature in our decision making and therefore I have not considered it relevant to your enquiry.

I suggest this was a test case for David Collins. David was a major player in the development of policy of 'managed realignment'. He made a significant contribution to the policy document *Making Space For Water*.

From 2005 he joined Environment Agency's Anglian Region on secondment from Defra overseeing delivery of estuary strategies and major wetland creation projects.

Here is a longer quote from his cv which is available at http://elmtwo.com/curriculum-vitae

> David Collins is a chartered environmentalist with 25 years experience in the fields of coastal management, wetland policy development and environmental appraisal. Over the last 10 years he has worked in the flood management industry, mainly as environmental policy advisor reporting to Head of Flood Management in Defra. He made a significant contribution to the development of the 'Making Space for Water' policy initiative, and help set up the Flood Management Innovation Fund. David has had a key role in developing Government policy on wetland management, with particular involvement in interpretation of the Habitats Regulations, development of environmental appraisal policy, and the Water Level Management Plan initiative. He wrote DefraŠs project appraisal guidance note 5 on Environmental Appraisal. He has experience in providing advice to senior officials and Ministers.
> From July 2005 he worked for the Environment Agency's Anglian Region on secondment from Defra overseeing delivery of estuary strategies and major wetland creation projects. He has continued to have a key role in these issues in his role as an independent consultant.

David Collins is now an independent consultant working as a subcontractor to WS Atkins being paid, by the state in effect, to help implement policies he himself created.

Where is the democratic accountablity in this.

If Devereux Farm was choosen for managed realignment because of the sea wall was vulnerable to erosion why did EA repeatedly tell people the reason for the project was to create salt marsh (intertidal habitat).

This reason was given by Merle Leeds in her letter to Peter Fletcher of Tendring District Planning date 28 October 2008.

The environmental report (ref IMAN001351) accompanying the planning application starts with

a non technical summary which starts

> The Environment Agency is proposing to create up to 48.5 (sic) of intertidal habit at Devereux Farm in partnership with the private landowner to meet Biodiversity targets in Essex for saltmarsh and saline lagoon creation.

Merle Leeds in her letter of 8 March 2011 to Tendring Planning repeats the aim for the project is to create intertidal habitat.

Charles Beardall in a letter to me of 13 May 2011 repeats the project is to create intertidal habitat.

On the ABP Mer Online Managed Realignment website the main reason for Devereux 1 project is given as 'Habitat creation (OM4/OM5)'

The first reference I can find to intertidal habitat not being the reason this site was choosen for managed realigment was the Minutes of the Anglian Eastern Transitional RFCC held on 15 July 2011, Boardroom, Iceni House, Ipswich which I saw on 22 September 2011.

At this meeting a presentation was made by Dr Chris Gibson of Natural England of (I believe) a new saltmarsh survey by NE and IECS which shows during the period 1997 to 2008 saltmarsh had grown back in Hamford Water.

> 11.4 Cllr Borrett noted areas of accretion and asked if new sites, which are not attached to the existing saltmarsh, had been included in this. Officers advised that they have surveyed the whole coastline to identify where the saltmarsh is.
>
> 11.5 Members were asked to note that the policies for managed realignment within the Essex and South Suffolk SMP **were not chosen to create habitat but because they were the most appropriate policy decision for that area**.
>
> 11.9 Cllr Howard asked Officers if they would revisit the policies with the Essex and South Suffolk SMP following the results of the study. **Officers advised that the policies would not be changed as they had been agreed by the Elected Members Forum on the basis of the vulnerability of the defences.** Officers advised that they would revise the Statement of Case elements of the SMP.

So if saltmarsh is growing back and there is no evidence of vulnerability to erosion what was the purpose of the Devereux 1 breach. Which cost a signifcant part of £1 million plus a £300,000 higher level stewardship agrement between NE and David Eagle. Yet this land is still going to be farmed with salt marsh grazed lamb.

I make a FOI/EIR request for all sites listed for managed realignment in Essex and South Suffolk SMP for each site please either

a) confirm you have evidence that sites chosen were vulnerable to erosion/coastal processes AND SUPPLY A COPY OF THE EVIDENCE YOU HOLD WHICH LEAD YOU TO MAKE THIS CLAIM

b) deny you hold evidence that sites chosen were vulnerable to erosion/coastal processes In which case will you explain why you made this claim.

One last point about Charles. ICO advised me to ask if a review had been held over my request for information and to ask EA to confirm the purpose of this review was soley to deal with my information request. Although I have made this request Charles has simply ignored it.

IROPI Part One

I believe Caroline Spellman has delegated signing off of IROPIs for UK SMP2 to DEFRA who have delegated again to EA.

There is clearly something wrong when an agency is allowed to sign off it's own statement of case.

Do you know of any such case where an agency hasn't signed of the case it made?

IROPI stands for

Imperative
Reason of
Overriding
PUBLIC
Interest

What is the public interest, overriding or not, of saltmarsh creation or managed realignment?

We now know, at least for Essex and South Suffolk SMP, managed realignment sites were choosen due to the vulnerability to erosion even though a great deal of time and money was spent trying to justify this as meeting legal requirement due to EU Habitats Directive to create more intertidal habitat.

An IROPI is required before development can proceed on a RAMSAR or SPA protected site.

An IROPI must show alternatives plans have been considered (including doing nothing) and the proposed plan must the one which best respects the integrity of the site, section 5.3.1 of The provisions of Article 6 of the 'Habitats' Directive 92/43/EEC

Section 5.3.1 ends by stating:

> In this phase, therefore, other assessment criteria, such as economic criteria, cannot be seen as overruling ecological criteria.

- Maintenance of Uneconomic Sea Flood Defences: A Way Forward, Sarah Nelson 1 April 2004
- Making space for water July 2004

Are completely explicit Managed Realignment is about saving money right from the 'get go'.

The SMP IROPIs, or at least the Essex and South Suffolk do not consider altenatives. There is a section labelled 'Alternative Solutions Considered' but this just contains a series of unsubstatiated claims with no evidence to support them at all.

In addition SMP and hence IROPIs are driven by 2 ideas

1. Accelerating rate of sea level rise
2. Coastal squeeze

for which there is no evidence at all. The 'evidence' for accelerating sea level rise is DEFRA projections of sea level rise which in turn is based on IPCC projections of rising temperatures. So there is no evidence only computer projections. As we will see later there is very strong evidence (not computer projections but observations and measurements) which show IPCC projections are wrong and there will be little or no temperature rise in the next century, and more likely a temperature fall of more than 1°C as the earth moves towards the next Little Ice Age.

Coastal squeeze is supposedly caused by rising sea levels, so if there is not rising sea levels there won't be no coastal squeeze.

I shall talk about both rising sea levels and coastal squeeze later.

For Hamford Water it is claimed that to do nothing would:

> have been more damaging as it would have resulted in a greater loss of intertidal habtitats due to costal squeeze in epochs 2 and 3. It will also be increasingly difficult to hold the line in future due to sea level rise and this could lead to uncontrolled breaches with consequent effects on SPA/Ramsar species.

1. Charles Beardall is in possession of 2 new surveys which show there has been an increase of salt marsh in Hamford Water over the last 12 years or so
2. Where is the evidence to support the claim there will be greater loss of intertidal habitat in epoch 2 and 3, I make an FOI/EIR request that it is produced. I suggest there is no evidence and this is just one of a series of spurious fabricated claims made to support SMP.
3. 'Could lead to' does not mean 'will lead to' and any effects on SPA/RAMSAR species is unknown. It might even be beneficial. Might as well say 'something may happen, we don't know what or whether it will be good or bad or even if it will happen at all'.
4. Charles Beardall has now said the Devereux 1 site was not 'informed' by vulnerability to erosion, this surely must call into question the claims for other sites where managed realignment is proposed.

There is a presumption that any plan an IROPI is made for is correct.

Maintenance of Uneconomic Sea Flood Defences, Making Space for Water and SMP all talk about uneconomic and/or failing sea defences such as the sea wall at Holland-on-Sea.

The section 4.4 of draft SMP states

> At Holland Haven (PDZ C2) the defences are under pressure and a landward realignment will create a more sustainable situation by reducing the pressure on defences and moving to a more natural coastal frontage.

Oh really? Where is the evidence. Please supply under FOI/EIR all evidence that supports the above statement re PDZ C2.

Actually the area of sea wall that is under pressure is between Holland Haven and Clacton Pier.

Here the sea wall is failing and under almost constant need of repair as

1. the groynes were not built properly
2. have been allowed to fall into a state of disrepair

I suggest knocking down the sea wall between Frinton and Holland Haven will do nothing to change this situation but the situation could be vastly improved by building proper groynes.

I quoted above from Hamford Water IROPI where concern was expressed over possible uncontrolled breaches sometime in the future.

Here is a planned controlled breach involving

- about 2km of wall that is currently in a good state of repair
- flooding Frinton Golf and Tennis Club
- flooding Holland Haven Country park

This is a considerable amount of planned destruction, I am sure EA has some very strong evidence (which I've already asked to be disclosed under FOI/EIR) which will support their claim this will releave the 'pressure' on sea wall at Holland Haven.

How about leaving the sea wall as it is and build proper rock groynes from Clacton Pier to Holland Haven, or even better to all the way to Frinton. Properly designed and constructed groynes cause a bank of dry sand to build up in front of the sea wall which stops the sea from reaching the wall, so the sea can no longer erode the wall.

But there is more, Holland Brook used to called Holland River and was apparently navigable to Thorpe. Presumably this means a large number of houses will be at risk and it would no longer be possible to travel along the B1032 from Great Holland to Clacton.

EA was quoted in Clacton and Frinton Gazette on 22 March 2012 (bottom of page 9, left hand column)

> . . . In this case the future issues is one of having to adapt and accept that Clacton will not be there in the future . . .

It is hard to see how an uncontrolled breach could be worse than this unnecessary planned one.

I believe as a result of local protest the plan for this management unit has been changed from managed realignment to a combination of hold the line and managed realignment. Surely it is not possible to simultaneously knock down and maintain a wall?

There are hardly any groynes in front of the sea wall between Holland Haven and Frinton. I am told this is because EA destroyed them when they place rocks in front of the sea wall.

Apart from what has already been discussed there are two specific errors in Essex and South Suffolk SMP which will be discussed in detail later. These errors are

1. Figure 2-6 on page 60 which shows recorded sea level rise is wrong
2. Table 2-1 of salt marsh loss on page 57 is wrong as it doesn't include results of latest survey

I have pointed both errors out to Charles Beardall with regard to Figure 2-6 he replied

> The final draft SMP which you have a copy of has been agreed by all partner organisations (9 local authorities, 2 county councils, ourselves, NE etc). Any changes to this plan (once approved) have to be agreed by the partners. We will raise your point about the content of page 60 at the next appropriate opportunity.

With regard to Table 2-1 he replied

> In reference to the table of saltmarsh loss in Essex and South Suffolk in the SMP, you are correct that it has not been updated. As previously explained, it is our intention to do so, however the opportunity for this will be when we have received a response from the Secretary of State confirming that the SMP is compliant with the Habitats Directive.

It is hard to understand why there should be two different responses to the same problem.

It is also hard to understand the point of knowingly submitting a document with errors for approval, unless correcting the errors would make it less likely the document is approved.

Sea Levels

Figure 2-6 on page 60 which shows recorded sea level rise is wrong.

I have written a long letter to EA about it and also posted about it on my blog A very bad way to calculate sea level rise.

The method used will give the right answer providing there is no missing data, as is the case with Newlyn, otherwise it gives the wrong answer.

The effect is to nearly double the actual rate of sea level rise.

Apart from anything else it's unnecessary as the Excel slope function will calculate the value for you directly.

The following table lists the sequence of events. I've included it to show the fustrating pointless waste of time and money that was incurred by Charles Beardall and Bill Donovan. The reason all the prevarication was pointless is Bill sent me a paper by Phil Woodworth which essentially agrees with my results.

The only sense I can make of this is EA staff have been instructed never to make any comment about the rate of sea level rise being less than DEFRA guidance.

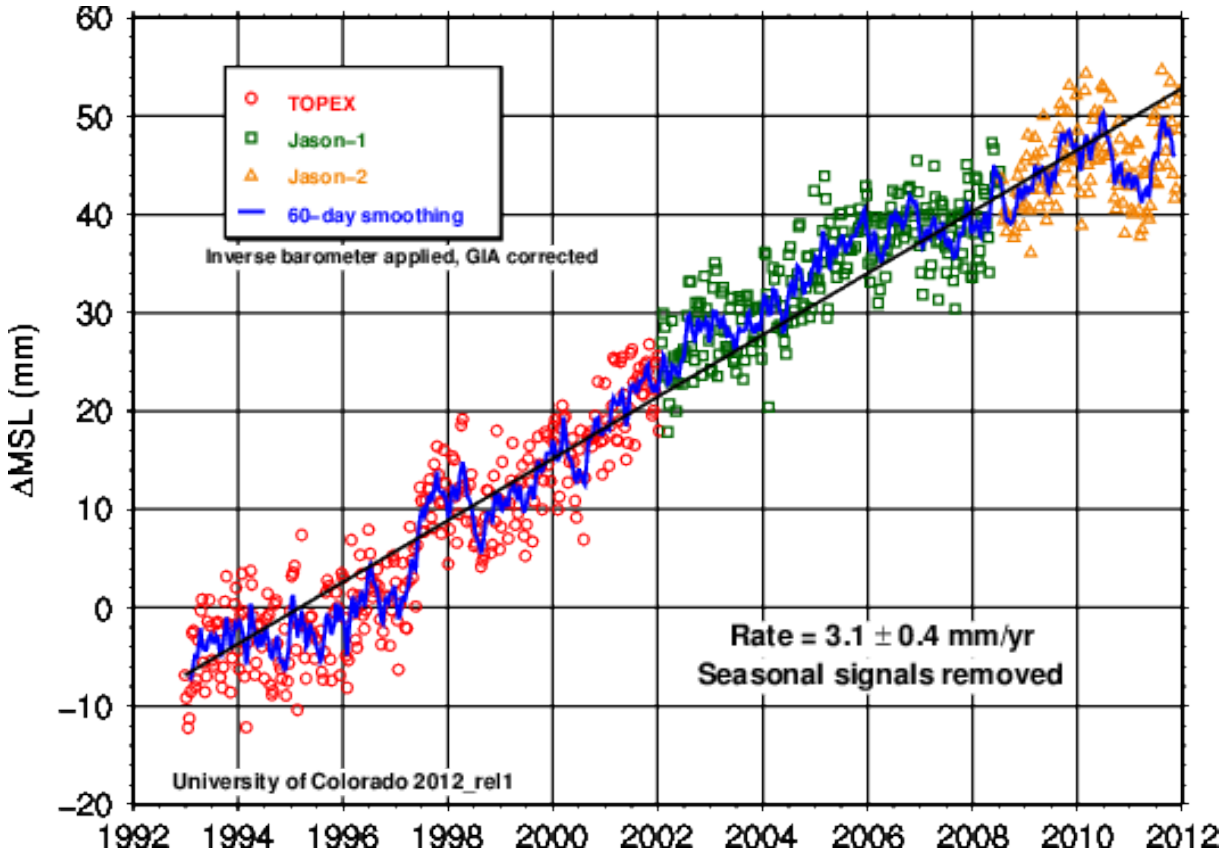
This is grounds for another complaint, EA have wasted both my and EA's time and money.

It appears Anglian region did not have anyone capable of calculating the slope of a graph and had to hire an external consultant. I should ask for you money back as the answer they gave was not only wrong, it was glaringly obviously wrong.

I make an FOI/EIR request as to how much money was spent on hiring this consultant.

EA, including Charles Beardall, have frequently said there is evidence rate of sea level rise rose to 3mm/year from 1993.

If this was ever true it clearly isn't now.



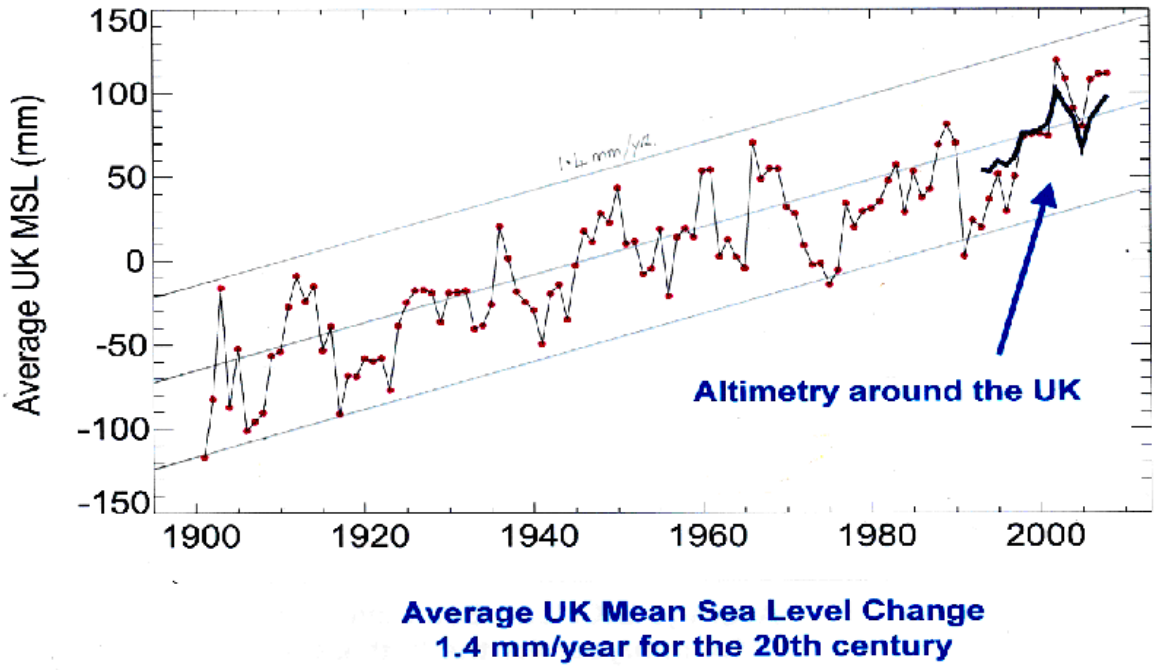
This graph from NASA/JPL via University of Colarado clearly shows sea levels where largely below trend since 2008, and completely below trend from about second quarter of March 2010.

In this blog post

jeremyshiers.com/blog/sea-levels-still-rising-and-envisat-records-altered-to-show-this/

I compare the rates of sea level rise for different satellites during periods when two or more were operating simultaneously. Until the adjustment around 10 April 2012 there was agreement that rate of sea level rise was less than 3mm/year from 2002.

The following graph produced by Phillip Woodworth shows clearly what happened.



So from 1993 to 2002 the rate of sea level rise was probably about 3mm/year But this is simply because there was a very sharp fall in sea levels around 1991, presumably aided and abetted by Pinatubo eruption. Then there was an exceptionally strong El Nino in 1998 with a smaller one in 2002.

28 Apr 11	I write to say the trend of sea levels at Felixstowe shows a slight fall.
13 May 11	Charles Beardall sends graphs of sea levels at Lowestoft and Southend. These graphs each have a line on but there is no explanation of what these lines represent.
16 May 11	I am sent a link to EA webpage, now removed, which shows sea levels at Newlyn, Sheerness, Liverpool and North Shields. I now know these graphs are figure 2.6 in Essex and South Suffolk SMP.
9 Jun 11	I send Charles Beardall a letter showing graphs of sea level at these seven locations and a table of rates of sea level rise. Pointing out I get very different values for Sheerness, Liverpool and North Shields to those claimed by EA.
23 Jun 11	Charles Beardall replies saying he's communicated with me about sea levels and isn't going to say any more. This is a tatic Charles has used several times, I feel it is rude, achieves nothing and is not the way a public servant should behave. You can take that as a formal complaint.
5 Sep 2011	I make FOI request for how sea level rise was calculated at Newlyn, Sheerness, Liverpool and North Shields.
30 Sep 2011	I am sent a copy of this spreadhseet use to calculate sea level rises.
13 Oct 2011	I write to say spreadsheet has serious error in way values are calculated and to say FOI request has not been fully satisfied
9 Nov 2011	I get a response to request of 13 Oct 2011, which is wrong. Even though consultant used to produce reply.

11 Nov 2011	Douglas Carswell, my mp, writes to Paul Leinster after I had a meeting with Douglas. Asks about sea level rise, salt marsh loss/gain.
14 Nov 2011	Charles Beardall replies to Douglas Carswell, on behalf of Paul Leinster managing not to give a sensible answer to Douglas' questions. On the same day Charles writes to councillor Robert Bucke saying EA will not proceed with second breach at Devereux farm.
22 Nov 2011	Write again to say still waiting for response to request of 13 Oct.
22 Nov 2011	Christine Dulake calls me unprompted to ask if Mark Johnson can call me.
24 Nov 2011	Mark Johnson calls me for a rather rambling chat with no particular purpose. Mark seems to imply 1. EA Anglian staff are not mathematicians or statiticians and can't be expected to be able to calculate the slope of a graph. 2. Devereux Farm project was a special case which involved David Collins, perhaps as a test case of managed realignment.
19 Dec 2011	Douglas Carswell writes to me to say he has seen Charles Beardall who says he can not help me any more. (He's right he hasn't helped me at all). Bill Donovan will be in touch.

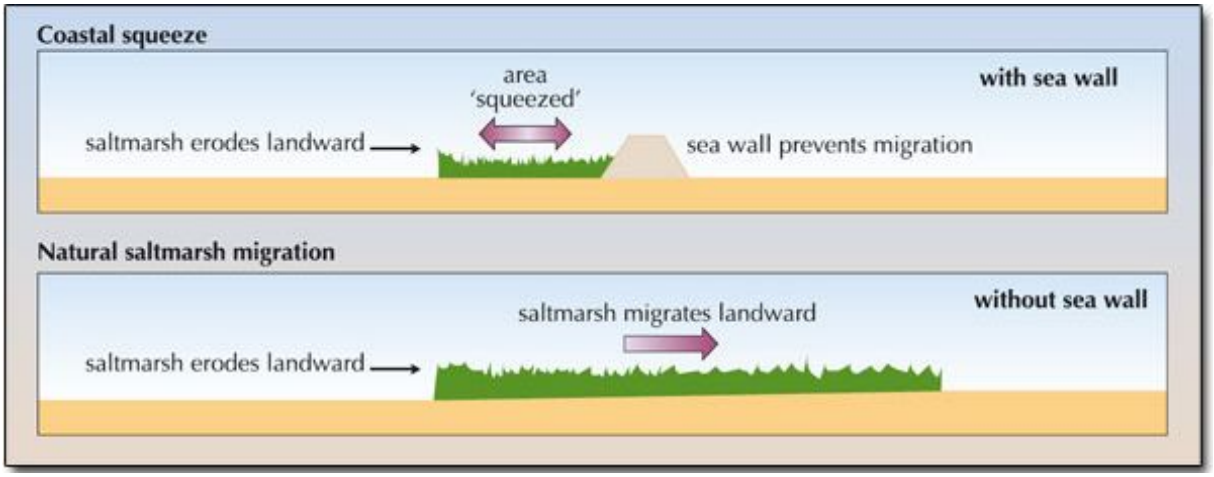
9 Jan 2012	Bill Donovan emails to make contact.
12 Jan 2012 12 Jan 2012	I reply giving an overview of communication with Anglian region in particular the lack of answer over problems with spreadsheet which calculates Figure 2-6. long chatty email from Bill Donovan with copy of paper by Philip Woodworth including rates of sea level rise from stations around UK.
17 Jan 2012	I reply saying Bill has not made any comment on faulty spreadsheet but my values are in close agrement with Philip Woodworth's.
18 Mar 2012	No answer from Bill for 2 months. I am sent a copy of email thread between Bill Donovan and Richard Steward so I write to Bill again.
10 Apr 2012	Email Bill Donovan with comments about the satellite data that was talked about with Richard Steward. In particular I demonstrate the claim frequently made by EA that rate of sea level rise increased to 3mm/year from 1993 can not be justified by satellite data. This communication had an FOI request which has not been answered and it should not have just been ignored.
16 Apr 2012 17 Apr 2012	Shortly after 10 April Envisat data held at aviso.oceanobs was altered fairly drastically in what looks like an attempt to bring Envisat into agrement with Poseidon/Topex. However the effect was to destroy the previous agreement between different satellites during periods where one or more was operating. Update my letter of 10 April and send to Bill. Bill replies noting my comments and says he will reply to the ones he can as soon as possible and forward others to appropriate team.
5 Jul 2012	as of now I'm still waiting.

Salt Marsh and Coastal Squeeze

There are 2 types of diagram which have been circulated to generate the notion of coastal squeeze. These seem to have originated within DEFRA/EA/NE but have migrated so far as EU habitats documents.

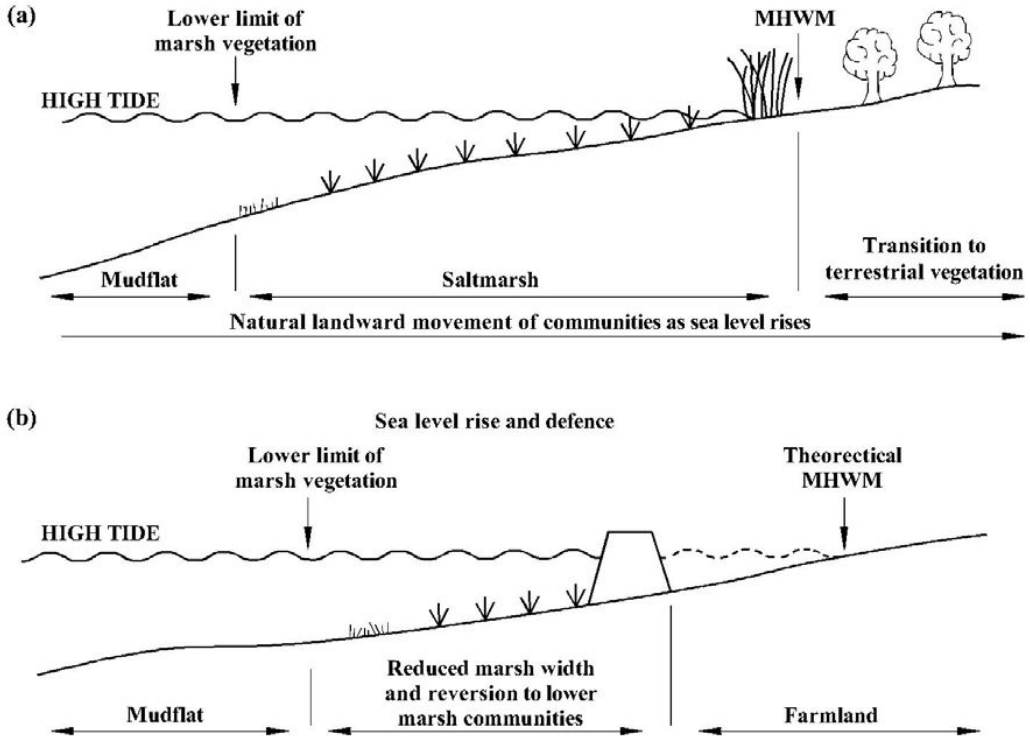
Here are the two diagrams, both of which are wrong.

Coastal Squeeze Diagram Type 1



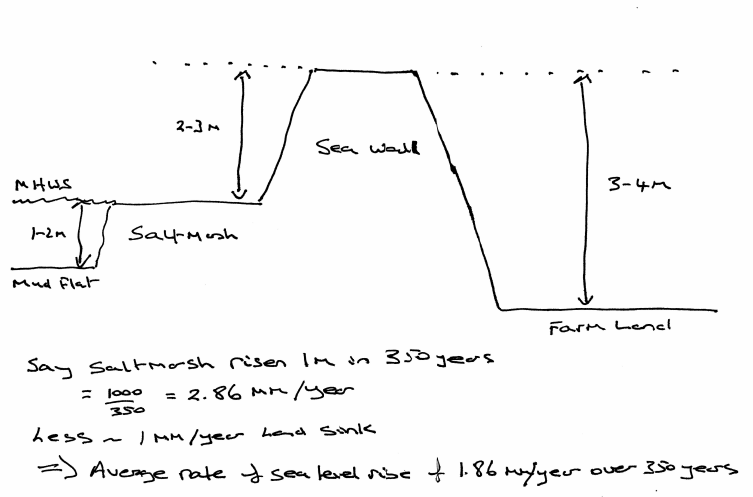
Notice how the level of the land magically changes in the type 1 diagram so that it rises when sea wall is not present.

Coastal Squeeze Type 2



The type 2 diagram is even more wrong than the type 1.

A correct coastal squeeze diagram would look like this.



The essential features of saltmarsh are

1. Saltmarsh is flat - it does not slope upwards as shown in type 2 diagram.
2. Saltmarsh is roughly the height of Mean High Water Spring Tide (MHWS) so the top of saltmarsh is almost never covered by water.
3. Saltmarsh rises with rising sea level providing there is sufficient sediment.
4. Saltmarsh that is covered by sea for extended periods dies.
5. The land behind the sea wall is LOWER than saltmarsh - a major error for both diagrams is they do not show this.
    - Sea walls where typically built about 350 years ago after restoration.
    - Then enclosed was largely flat and about same level was mud flats outside sea wall.
    - Sea levels have risen around 1-2mm/year since sea walls built.
    - So farm land is about 1 metre lower than saltmarsh.

Look at the following figures in Essex and South Suffolk SMP

page 51 Figure 2-2 Old Hall Marsh, Blackwater estuary

page 55 Figure 2-4 Saltmarsh and mudflat formations, Blackwater estuary

page 66 Figure 2-9 Hamford Water

page 69 Figure 2-11 Mersea Island (courtesy of ECC)

How do I know about saltmarsh?

I have lived in Essex within a mile of the sea for most of my life. For the last 24 I have lived in Kirby-le-Soken less 1/2 mile from sea wall, where I walk regularly, often daily. In addition I have sailed around Hamford Water and other Essex and Suffolk waters.

It is only necessary to open your eyes and look.

Here is saltmarsh near where I live.

This blog post has more pictures - what is salt marsh?.

Table 2.1 on page 57 of Essex and South Suffolk SMP gives rates of saltmarsh loss in this SMP area shows a total loss of 48.5 ha in a number of sites that have been monitored, mostly from 1988 to 1997.

Site	Period	Saltmarsh ha at end period	Loss ha in period	Percentage Loss
Stour and Orwell	1988-1997	161	6.3	3.9%
Hamford Water	1988-1998	614	14.4	2.3%
Colne	1988-1998	670	5.6	0.8%
Blackwater	1988-1997	670	7.0	1.0%
Dengie	1988-1998	409	2.7	0.7%
River Crouch	1998-2000	276	10.4	3.8%
River Roach	1998-2000	113	0.7	0.6%
Benfleet and Southend	1988-1998	135	1.4	1.0%
Total		3048	48.5	1.6%

The loss for Crouch and Roach was measured over a different period from the other sites. At 12.1ha/year this makes up one quarter of loss. This approach is highly dubious at best and in face of latter surveys simply wrong as the IECS survey showed a gain of 0.36 ha/year for the

Crouch and Roach from 1997 to 2008 and EA have adopted this figure.

There have been a number of saltmarsh surveys

- ITE in 1973
- Burd in 1988
- Cooper in 1998
- EA from 2006-2009
- IECS initial survey 1997 (mostly) , final survey 2008 (mostly)

The following table comes from table 4.2 of EA report 'The extent of saltmarsh in England and Wales:2006-2009'

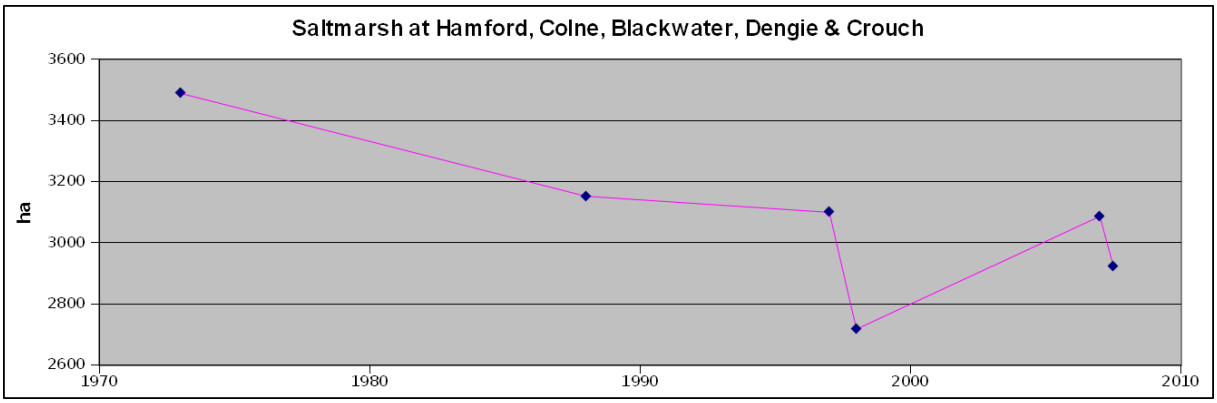
	1973	1988	1998	2006 – 2009
Orwell	99.5	69.5	53.7	58.96
Stour (Essex)	264.2	148.2	107.4	114.16
Hamford Water	876.1	765.4	621.1	674.81
Blackwater and Colne	1671.7	1482.9	1378.5	1373.80
Dengie	473.8	436.5	409.7	449.30
Crouch	467.1	467.1	307.8	425.84
Thames (Lower)	443.7	–	–	07.08
Medway	843.8			763.38
Swale	377.0	–	–	462.89

The following table is an abbreviated extract of Table 9 in Volume 1 of IECS Essex Coastal SSSIs: Assessment of Changes in Extent of Saltmarsh over the Period 1997 to 2008.

SSI	Saltmarsh ha Start Period	Saltmarsh ha End Period	Rate Change ha/year
Hamford Water	694.82	698.13	0.30
Colne Estuary	719.63	714.30	−0.62
Blackwater Estuary*	724.02	724.96	−0.13
Dengie	455.48	439.88	−1.42
Foulness	279.45	271.89	−0.85
Benfleet & Southend Marshes	162.76	174.76	1.09
Total	3541.49	3532.89	−8.60

In the table below I have combined the EA and IECS tables for sites where they both have data.

SSI	1973 ite	1988	1997 iecs start	1998 cooper	2007 iecs end	2006-2009 ea
Hamford Water	876.1	765.4	694.8	621.1	698.1	674.8
Blackwater and Colne	1671.7	1482.9	1443.7	1378.5	1439.3	1373.8
Dengie	473.8	436.5	455.5	409.7	439.9	449.3
Crouch	467.1	467.1	505.3	307.8	509.0	425.8
Total	3488.7	3151.9	3099.3	2717.1	3086.2	2923.8



Fiona Burd's original paper estianted that 40ha/year of saltmarsh was being lost in East Anglia and by assuming a linear trend concluded soon it would all be gone so something had to be done.

It should be clear from the graphs and summary table

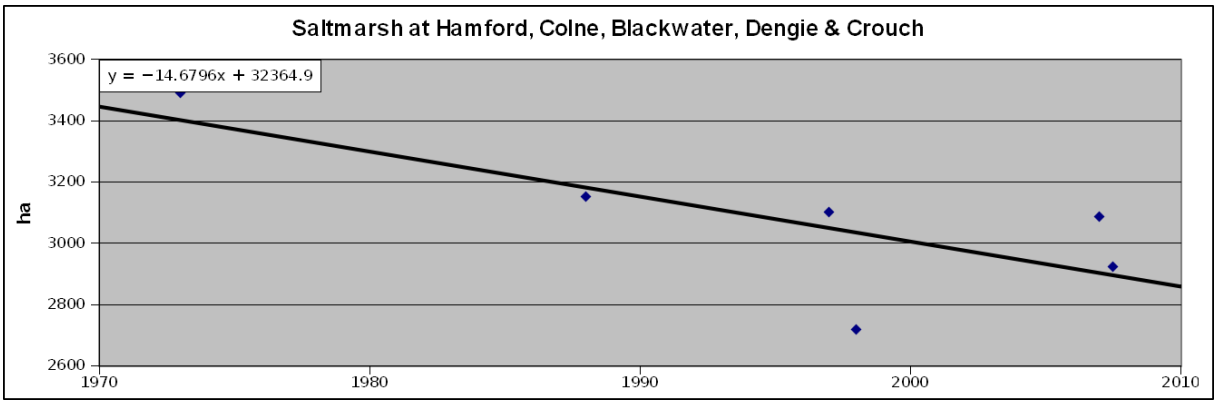
1. there is no linear trend
2. 1998 Cooper figure is clearly significantly lower.
3. 1973 ITE figure is possibly, even probably and overestimate.

Even though I have said there is no linear trend I am surprised no one has tried to calculate one, especially given how keen everyone is to calculate linear trends for sea level rise.

The following table shows the rate of salt marsh loss as found by choosing different pairs of surveys. It is striking how large the effect of the 1998 Cooper survey is, especially with respect to the 1988 survey. Choosing other pairs gives a rate of saltmarsh loss which is between 71% down to 13%.

	$saltmarshlossha/year$
1973 - 1988	22.5
1988 - 1998	43.5
1973 - 1998	30.9
1973 - 1997	16.2
1988 - 1997	5.8

The trend for all surveys (arbitarily assiging a date of 2007.5 to EA survery) is a loss of 14.7 ha/year, a lot less than 45.



Fiona Burd went on to conduct a saltmarsh survey of England and Wales in 1989 and found 39248 ha.

The recent EA survey found 40522 ha, which they state was more than expected. Pages 28 to 47 of the EA report discuss the change in saltmarsh and in particular compare the amount found by Burd and by EA. Several pages are devoted to discussing possible errors in Burd's measurements and conclude this is likely to be in range 2-7% which would have the effect of bringing her figure closer to, or exceeding EA's more recent measurement.

I see several gross errors here.

1. Each and every measurement should have an error associated with it. This is standard practice at least in the branch of science I studied, physics.
2. The only measurement where there is an error estimate is Fiona Burd's.
3. The 2-7% error is assumed to be positive, ie it assumed Burd has understated the extent of saltmarsh. But the error could equally mean an overstatement.
4. EA 'know' saltmarsh has erorded so they have look for a fudge factor. Whilst there may have been measurement errors it is clearly wrong to adjust measurements to get the result you want.

AN IMPORTANT ADDITIONAL POINT

Section 4.1.2 of EA Saltmarsh report makes a very important point. Different surveys do not necessarily survey exactly the same area which will render comparisions error prone.

The 1973 survey used photographs at scale of 1:10000 and these were traced (by hand) onto OS maps.

The 1988 survey used 1:5000 photographs which were again traced then digitised.

'25 years of salt marsh erosion in Essex' notes both the results of 1973 and 1988 surveys may have been affected by the limitations of methodology used, in particular the photographs were at different scales but both sets were unrectified.

Section 5.2 of EA Saltmarsh report notes that

> With respect to the original annual 100ha loss figures predicted by Pye and French the changes in extent observed are due to either or both of the following.
>
> - The differences in methodology which mean that the NCC (Burd 1989) survey underestimated saltmarsh habitat compared with the Environment Agency (2006-2009) aerial survey.
> - Saltmarsh is not eroding at a rate of 100ha per year as current UK targets suggest.

The report then goes on to note a 5% overestimate implies a 47 ha annual loss. but a 5% underestimate imples a 123 ha annual gain.

And with that in mind notes the current national (and by implication regional targets) be reviewed.

A more local comment on the difficulty of estimating saltmarsh gain or loss can be found in Richard Steward's BEG Critique where he notes on page 13

> Dr N Cooper's report for the EA '*Saltmarsh change within the Suffolk estuaries between 1971,1986 and 1998*' p24 claims a 7.9% saltmarsh loss over 27 years for the Blyth, and Dr J French's paper '*Tidal marsh sedimentation versus sea level rise*' p11 claims a 16.1% increase in the same period.

As I was finishing this letter Charles Beardall sent me a copy of Appendix M of '*Essex and South Suffolk Shoreline Management Plan (SMP) 2 Habitats Regulations Assessment Report*'.

Table 6.1 from this Appendix is

SSI	Annual derived rate of change (ha/yr)
Stour and Orwell	1.34
Hamford Water	0.3
Colne Estuary	−0.62
Blackwater Estuary	−0.13
Dengie Peninsula	−1.42
Crouch and Roach	0.52
Foulness	−0.85
Benfleet and Southend Marshes	1.09
Total	0.23
Total considered within SMP2/HRA (excludes Benfleet and Southend)	−0.9

There is a discussion which attempts to justify EA's decision to standardise on

- a loss of 45 ha/year up to 1997
- a loss of 0.9 ha/year from 1997

> These changes were previously, based on the Cooper et al. (2000) report, assumed to be losses at a rate of 45ha/yr. However the more recent IECS and Environment Agency data cast doubt upon such pessimistic rates. As above the best available data come from different sources. The approach which has been agreed by the SMP HRA project team is that the only robust way to calculate the historic losses is to take the rate from Cooper et al. (2000) to cover the period 1992-1997 (a loss of 45ha/yr (see Collins 2011)), and the IECS (2011) and Environment Agency (2011) data to cover the period 1998-2005 (a loss of 0.9ha/yr). Whilst the best approach at this stage, this clearly results in an awkward situation where in 1998 the overall loss rate drops significantly. Whilst seemingly unsound, more complex manipulation of the data would again serve little scientific purpose since the decadal nature of the datasets means it would be impossible to determine the accuracy of any more detailed attempts to hindcast changes in the system. Total pre-SMP2 losses (1992-2005) are therefore calculated at 231ha. Managed realignments which pre-date the SMP (i.e. earlier than 2005) have provided 119ha of new habitat (as detailed in Collins 2011), leading to a shortfall of 112ha.

This approach is clearly wrong. The figure of 45 ha/year loss comes from the descent from 1973 ITE and 1988 Burd figures to the 1998 Cooper survey. There is no sense in chopping this trend a year early and deciding the trend is 0.9ha/year.

As I pointed out earlier the 12.1 ha/year of the 45 ha/year come from a survey conducted between 1998 and 2000. This must be wrong as the IECS survey (presumably a major contributor to EA adopting the later 0.9ha/year loss) found

1. a GAIN of 0.52ha/year from 2000 to 2007.

2. The end of the 1998-2000 found a total of 389 ha in Crouch and Roach
3. The start of the IECS 2000-2007 survey found 505.33 ha. Was there a gain of 116 ha in Crouch and Roach in less than 1 year?
4. Did the rate of saltmarsh loss/gain really change from -12.1ha/year to +0.52ha/year in 2000.

If IECS are correct and there was 505.33 ha of saltmarsh in Crouch and Roach in 2000 there can not have been a loss of 12.1 ha/year in the preceeding 2 years.

EA have extrapolated this 12.1 ha/year held back to 1992. Removing 12.1 ha/year from the 45 ha/year loss for all of Essex SMP reduces the loss to 32.9 ha/year. Then using EA's dubious methodology there would be a loss of 171.7 ha from 1992 to 2005, not 231 ha. Given 119 ha have been created there is a shortfall of 52.7 ha not 112 ha.

It seems most likely either

a The ITE, Burd and Cooper surveys were wrong with ITE and Burd overestimating the amount of saltmarsh and Cooper underestimating it.
b Saltmarsh erosion and accretion does not proceed in a linear fashion, most surveys have noted accretion in some areas and loss in others.

or both.

Natural England and Coastal Squeeze

I have been corresponding with NE about Coastal Squeeze and their saltmarsh survey.

This letter is already quite long so I shall just point you to where you can download a copy of my main letter to NE.

http://jeremyshiers.com/downloads/20111201_tex.pdf

In this letter to NE I point out an area of saltmarsh (opposite Peter Point, Kirby le Soken) was identified as being eroded between 1997 and 2008 yet it is clearly visible using Google Earth in 2009. In fact comparing pictures from Google Earth at different times with a aerial photograph from around 1959 the striking thing is how little has changed.

There is one difference, there is a significant difference at different times of year as saltmarsh becomes quite brown in winter.

NE's reponse was

> Our advisers and field staff are very mindful of the need, and are able to distinguish between salt marsh vegetation and its characteristics between winter and summer, and this would be taken into account in any survey, either desk or field based.

As this may seem slightly negative critiscm I would like to say overall I have found NE significantly more helpful and more open to different ideas than EA.

I asked NE to send me evidence they help which supported the idea of coastal squeeze.

i Essex Coast Coastal Habitat Management Plan (CHAMP) 2002

ii A link to the peer-reviewed National Ecosystem Assessment, particular reference Chapter 11. http://uknea.unep-wcmc.org/Resources/tabid/82/Default.aspx

iii anagement model for 'Atlantic saltmeadow', one of the EU SAC saltmarsh habitat types, also highlights the issue of saltmarsh erosion. http://ec.europa.eu/environment/nature/natura2000/management/habitats/pdf/1330_Atlantic_-salt_meadows.pdf

iv A paper on saltmarsh erosion in SE England (Pye in Sherwood et al 2000)

v A study into approaches and attitudes to managed realignment across Europe by Cambridge University http://www.geog.cam.ac.uk/research/projects/europeanmanagedrealignment/

vi Pages from the Geological Conservation Review with specific reference to Dengie peninsula in Essex http://jncc.defra.gov.uk/pdf/gcrdb/GCRsiteaccount2737.pdf

These documents discuss many causes of saltmarsh erosion and are clearly not any sort of evidence in support of Coastal Squeeze.

I shall limit myself to the paper by Pye which is published on pages 350-396 of British Saltmarshes.

page	comment
364	Lists 4 types of erosion 1. lateral retreat from seaward edge 2. erosional lowering of parts of marsh surface, usually involving partial or complete destruction of the vegetation. 3. internal dissection and enlargment of the drainage network, ultimately leading to the creation of mud basins. 4. direct removal (mud digging). None of which are coastal squeeze.
373	Numerous studies have suggested sea level rise is a major cause of saltmarsh erosion BUT marshes may continue to accrete both vertically and laterally, despite sea level rise, if sufficient sediment is available.
375	Numerous studies have shown that vertical accretion of saltmarshes can keep pace with rates of sea level rise in excess of 10mm/year provided that an adequate sediment supply is mainatined.
386	**Breaching of sea defences** ... Futhermore, in years following embaniking there is normally an increasing height difference between the surface of the reclaimed marsh and that of active marshon the outside of the sea wall. ... If the sea defences are breached after a period of decades (or centuries) a considerable depth of tidal water is able to flood the former reclaimed area. If the surface level is too low pioneer and low saltmarsh communities will be unable to establish themselves and the area will revert to mudflat or standing water.
387	Soluble sulphides retard the growth of higher marsh plants. Sediment accretion helps to prevent the development of poorly drained, excessively anoxic condition in the root zone; the higher bettere drained areas are subject to more effective tidal flusing, receive more nurtients and are less prone to the build-up of toxic products than low lying areas. Marsh vigour is rapidly lost in areas where the supply of sediment is cut off and frequency of tidial flushing reduced, ...

So not much support for coastal squeeze or even concern about sea level rise providing there is adequate sediment.

Given Pye finds sedimentation rate to saltmarsh (not just creation, but its continued health and existence) has EA or NE conducted any sedimentation studies at proposed managed realignment sites and existing saltmarsh locations. I make an FOI/EIR request for details of any such surveys and the results if any surveys have taken place.

How about surveys of sulphides or other pollutants, again I make an FOI/EIR request for details of any such surveys and the results if any surveys have taken place.

Sedimentation highlights the internal inconsistency in DEFRA/EA/NE plan to recreate saltmarsh via managed realignment.

Accelerating rates of sea level rise are claimed to be causing coastal squeeze, killing saltmarsh.

But any new saltmarsh created (if it can be created) will die rate of sea level rise exceeeds the sedimenation rate.

As far as I know the only serious studies of sedimentation rate in East Anglia have been at Tollesbury and River Blyth and rate of about 9.7 mm/year was found at both locations. DEFRA 2006 predictions mean this sedimenation rate would be outpaced by around 2055. So I asked Charles Beardall

> 19 Septeber 2011
> *What evidence do we have that the sediment rate in the existing realignment site at Devereux Farm will outpace Defra 2006 sea level rise predictions?*
> As you rightly say, if sea levels rises very rapidly in future, these new saltmarshes may eventually be submerged and become mudflat. We would not expect this to occur for a number of decades, but whether the saltmarsh will still be there in 50 years we cannot say with any certainty.

So EA have flooded farmland and can not say with any certainty whether there will be saltmarsh there in 50 years time.

Back around page 8 I wondered what was motivating the planned destruction of Jaywick and Holland Haven/Frinton Golf Club.

Page 386 of the Pye paper provides an answer. Most seawalls were embanked severeal hundred years ago and so the enclosed land is a metre of more below the current sea level. As Pye says saltmarsh may well not develop at such sites if the sea wall is breached as the land will just be flooded.

But as Jaywick and Holland Haven sea walls were built a hundred years or less the level of enclosed land will be much closer to current sea level and hence there is just a far greater chance of creating saltmarsh.

Following Burd's paper there was a panic and DEFRA set targets for 100ha/year saltmarsh to be created in UK with 40 ha/year to be created in EA Anglian region. So for the only thing that matters to EA is meeting the target.

Even though section 5.2 of EA saltmarsh report discusses reviewing 100 ha/year figure until DEFRA changes the target it stands.

Burrowing As A Cause Of Saltmarsh Erosion

Anyone who looks at saltmarsh can clearly see it is almost always riddled with holes as the following picture shows.

The next picture is taken of a piece of saltmarsh in the pool by Thatched Cottage, Quay Lane, Kirby le Soken. This pool is protected by the quay. High tides are usually a few inches higher than the quay so sea water flows over the quay at high tide to fill the pool. There can be no coastal squeeze here as the piece of saltmarsh is isolated in the middle of the pool.

It is hard to see what can have made the hole at the right end of the saltmarsh other than some animal burrowing.

The East Anglian edition of 'Inside Out' broadcast on 17 October 2011 contained a section about saltmarsh featuring Robert Simper, Richard Steward and Dr Rob Hughes.

The program clearly showed crabs burrowing into saltmarsh and also there were ragworms burrowing into saltmarsh.

Why is the burrowing of these invertebrates not investigated by DEFRA/EA/NE?

When asked if crabs (and/or ragworm) could be cause of saltmarsh loss Tarazar Astley-Reid of Suffolk Coast & Heaths replied

> They could be in some areas but not in all areas therefore you've got to look at it in the big picture we've played around with these rivers an awful lot we've put in walls we've put in developments the channels change all the time that's why they're esturaies they're very very dynamic

When asked what should people like Richard Steward and Rob Hughes should do Tarazar replied

> If people have inovative ideas and they feel things are changing on the estuary they can always come to me and ask to try and develop project ideas and try and see if we can get some funding

I struggle to understand what Tarazar meant by her first statement but she seems open to the possibility burrowing by crabs and ragworms could be contributing to saltmarsh erosion.

The program quoted EA as stating

> It wouldn't be feasible to carry out detailed enough study to assess the sole affect of crabs. while other factors are considered, including crab burrowing sea level rise remains it's focus as its responsiblility is to respond to man made activities.

I make a FOI/EIR request for the information EA holds which caused it to state it wouldn't be feasilbe to carry out detailed enough study to assess the sole affect of crabs.

By stating

1. sea level rise remains its focus
2. as its responsiblility is to respond to man made activities

there is an implication EA thinks sea level rise is due to man made activities.

This is obviously false as sea levels have risen since the end of the last ice age, although there have been some periods (e.g. the lead up to the Little Ice Age) when sea levels fell for a time.

Can you confirm the statement made to Inside Out is correct?

If it turns out crabs and ragworm are a major cause of saltmarsh erosion will EA's response continue to ignore their effect on the grounds EA only responds to man made activities?

It seems highly unlikely the programme correctly reflected EA's opinion as EA has been very visible in responding to recent flooding all across UK due to rain and presummably this was not caused by man made activities.

10 Reasons Why IPCC Claimed Climate Change Is Not Happening

So EA and NE Climate Change Adjustments Not Necessary

1	A change in temperature does not give you any information about amount of warming or cooling of an unknown mixture of stuff This is no more than A level physics based on different densities, specific and latent heats of different substances. As this point surprises people I shall discuss it in more detail on the next page.
2	Temperature datasets have been shown to have been altered to enhance warming.
3	Temperature datasets do not agree with paper records, in particular newspapers which have been scanned by google
4	Temperature datasets show marked jumps when number of weather stations changes (as in 1990)
5	Rural weather stations in US show a slight fall from 1900 to 2000
6	Ross McKitrick has shown there is overwhelming evidence that any rise in temperature record is due to urbanisation.
7	There is a clear differences in temperature 'rise' in Northern and Southern hemispheres.
8	From 1990 to 2000 IPCC attribute $0.8wm^{-2}$ warming due to CO2 yet there was a rise of at least $6.0wm^{-2}$ during the same period due to increase in solar output and decrease in cloud cover. IPCC ignored this. Since 2000 solar output has decreased, cloud cover has increased and temperatures have fallen and so have sea levels. Arctic ice has extended and thickened.
9	Warming due to green house gases is supposed to proceed by LW radiation (or infrared). Where is the LW signal . It should be clear but isn't.
10	Satellite data strongly disagrees with IPCC CO_2 model.

What does a change in temperature tell you about energy lost or gained?

The part of science which talks about temperature is thermodynamics which is part of physics. Temperature is an indication of how much energy (heat energy) stuff has.

Although IPCC present information to the public in terms of global temperature the scientific discussion is framed in terms of 'energy inbalance' how much more energy is the earth absorbing versus how much it is losing. The favourite way of measuring this is in watts per square meter or $w\ m^{-2}$. IPCC get off to a bad start as watts is a measure of power (how much energy is used in a given time) and not energy itself.

We immediately hit a problem as different types of stuff require very different amounts of heat energy to produce a given change in temperature.

Energy is measured in joules(j) and kilo joules (kj). The amount of energy stuff needs to warm or cool is called specific heat, unless the stuff is changing state, e.g. ice melting to water, then it is called latent heat. Specific and latent heats are measured in kilojoules/kilogram/degree ($kjkg^{-1}C^{-1}$).[1]

latent heat of ice	334	$kj\ kg^{-1}\ C^{-1}$
approx specific heat ice	2.0	$kj\ kg^{-1}\ C^{-1}$
approx specific heat water	4.10	$kj\ kg^{-1}\ C^{-1}$
approx specific heat of dry air	1	$kj\ kg^{-1}\ C^{-1}$

But the density of air is 1000 times less than much less than that of ice or water

density of ice or water	1000	$kg\ m^{-3}$
density of air	1	$kg\ m^{-3}$

So a kilogram of ice takes 334 times as much energy to melt as it takes to raise a kilogram of air 1°C. And whilst ice is melting it will not change temperature at all.

To put it another way the temperature of 1 kilogram dry air would rise by 334°C if it absorbed the same amount of energy needed to melt 1 kilogram of ice.

Moreover, air is about 1/1000 the density of water and ice, so to warm the same volume of water or ice by 1°C takes about 4000 times as much energy as it does to warm the same volume of dry air by 1°C.

Ice takes 334,000 times as much energy to melt as it does to raise the same volume of dry air by 1°C.

But air can contain water as ice(snow or hail), water (rain drops) or water vapour. So unless you know how much ice or water air contains a change of temperature tells you nothing about the amount of energy gained or lost.

[1] specific and latent heats are actually measured in K (degrees Kelvin) not C (degrees centigrade) but I am addressing a general audience and a change of 1°C is the same as 1°K.

Finally there appears to be a later edition of the SMP than the draft I have would it be possible to send me a copy.

yours sincerely

Jeremy Shiers