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From: [REDACTED]
Sent: Thursday, 25 February 2016 2:23 PM
To: OEH PD Coastal Reforms Mailbox
Cc: Angus Gordon; Bruce Thom; Bruce Coates
Subject: Submission 2 on the draft Coastal Management Manual - hazard study time horizons.

Follow Up Flag: Follow up
Flag Status: Completed

This second submission relates to the yet to be released *Guidelines for coastal hazard and risk assessment* which will form part of the Toolkit upon which the Manual crucially draws on many issues, including how hazard and risk assessments will be arrived at and applied under the new coastal legislation. The objective of this submission is to have its recommendations influence the drafting of the Guidelines before their release on exhibition.

Recommendation.

The time horizon for hazard studies relating to coastal dwellings should be the same, up and down the coast, to provide uniformity of perceived risk. If, for example, some councils were to move to a 50 year hazard study horizon, and others retain a 100 year horizon, the relative hazard lines would communicate entirely different perceptions of risk and property values on similar beaches. We look to such arbitrary and misleading comparisons being excluded under the new coastal legislation.

Paul Flemming.

Spokesperson for Lake Cathie Coastal Residents Group.

From: [REDACTED]
Sent: Thursday, 25 February 2016 2:12 PM
To: OEH PD Coastal Reforms Mailbox
Cc: Angus Gordon; Professor Bruce Thom; Bruce Coates
Subject: Submission 1 on the draft Coastal Management Manual Toolkit - sea level rise.

Follow Up Flag: Follow up
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This first submission relates to the yet to be released *Sea Level Rise – Technical Advice for NSW Coastal Councils* which will form part of the Toolkit upon which the Manual crucially draws on many issues, including how sea level rise projections will be arrived at and applied under the new coastal legislation. The objective of this submission is to have its recommendations influence the drafting of the Sea Level Rise Guidelines before their release on exhibition.

Background.

When the State passed the responsibility for sea level rise (SLR) projections in hazard studies to coastal councils, councils could, and in a number of cases did, simply go their own ways as the result of local lobbying. The magnitude of the uncertainties in global sea level rise projections many times exceeds the magnitude of local variations in sea levels. Thus there is no need for councils to depart from uniform SLR projections for NSW, in either quantum or horizon, unless they form the view that they have cases to justify, and gain OEH agreement to, minor local variations.

Recommendations.

We submit that the SLR coverage in the Toolkit should comprise two parts:

1. OEH's uniform SLR projection advice to all NSW coastal councils.
2. The synthesis of SLR research applicable to NSW, as foreshadowed. Based on this, councils will be able to consider whether they have cases to justify, and gain OEH agreement to, minor local variations from the uniform SLR projection advice.

Policy expansion.

This approach would expand the policy of councils having prime responsibility for arriving at hazard studies which take account of possible local variations, whilst giving the necessary control under the guidelines to exclude the past arbitrary and unscientific variations in the SLRs adopted by coastal councils. It would result in productivity gains at both State and Local Government levels, and importantly, councils would continue to be responsible to their communities for the ultimate SLRs used in hazard studies.

Paul Flemming.

Spokesperson for Lake Cathie Coastal Residents Group.

From: [REDACTED]
Sent: Saturday, 27 February 2016 3:32 PM
To: OEH PD Coastal Reforms Mailbox
Cc: Angus Gordon; Bruce Thom; Bruce Coates
Subject: 262 (part 3 of 4)_Flemming_270216: Submission on the draft Coastal Management Manual - misleading probabilities.

Follow Up Flag: Follow up
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We argue below that the way in which percentage probabilities are applied in the draft Manual is seriously misleading for non-scientists, including coastal property owners and persons contemplating ownership. To redress this, we submit our preferred recommendation, and a fall-back recommendation.

Our argument.

The following is from page 17 in Part B Stage 3 of the draft Coastal Management Manual, where the coastal vulnerability area permits a range of brownfield development under specific circumstances including:

- *relocatable dwellings with disposable infrastructure between the 50 year 50% and the 50 year 10% exceedance line; traditional housing on pile foundations, between the 50 year 10% and the 50 year 1% exceedance line*

(The draft then adds) *Note, the '50 year 50% exceedance line' is the landward eroded position of the shoreline that has a 50% probability of being exceeded in the next 50 years.*

To non-scientists, the statement that *the landward eroded position of the shoreline that has a 50% probability of being exceeded in the next 50 years* has a straightforward implication – “there’s a 50% likelihood that erosion will exceed this line in 50 years”. But, of course, this is not what the coastal science is saying.

In general terms, levels of probability are factually established by observation and past experience. In contrast, the 50% shoreline projection in the draft is based on mathematical modelling 50 years into the future. All such modelled projections include uncertainties in the magnitudes of the included parameters, along with uncertainties as to whether all relevant parameters have been included. In coastal erosion modelling, both types of uncertainty are unavoidably large.

Accordingly, no ‘probabilities’, in the sense understood by non-scientists, can be applied to shoreline projections, because they are arrived at by modelling which has uncertainties, considerable in the case of long term beach erosion projections. It follows that, in order to communicate meaningfully to non-scientists as well as scientists, the draft’s 50 years shoreline projection should not be described as having 50% probability, but as ‘the most likely 50 years shoreline projection, arrived at by modelling, with its inherent uncertainties’.

The draft’s 90%, 10% and 1% probabilities would likewise seriously mislead non-scientists. These projections in fact display the extent by which the modelled set of shorelines spread either side of the

mean projected shoreline. Seaward, they are projections of less erosion, landward of more erosion. Since the mean projection can have no commonly understood probability, neither can these projections.

Preferred Recommendation.

We recommend that the intended procedures for arriving at these lines be retained, but that they be re-titled as follows:

- 50% exceedance line to become *the most likely 50 years shoreline projection, arrived at by modelling**.
- 90% exceedance line to become *the optimistic 50 years shoreline projection, arrived at by modelling*. (Optimistic because this is the least eroded projection)*
- 10% exceedance line to become *the pessimistic 50 years shoreline projection, arrived at by modelling*. (Pessimistic because this is the most eroded projection)*
- 1% exceedance line to become *the very pessimistic 50 years shoreline projection, arrived at by modelling**.

** The 50 year modelling of changes in shoreline position includes unavoidable inherent uncertainties.*

These descriptions would, we believe, convey the modelled results in a form that will best enable non-scientists to comprehend and consider the risk levels.

Fall-back recommendation.

We believe that erosion projections expressed as above would gain general acceptance, and generate the desired responses. People's life experience tells them that coastal science cannot forecast 50 or 100 years out 'with 50% probability' where beaches will finish up as the result of global warming. To claim this accuracy, as the draft does at present, would discredit the Act in most people's eyes, from the outset.

However, if the above argument and preferred recommendation is not accepted, we submit that referring to the shoreline projections in terms of their 'exceedance' will be misunderstood, wellnigh universally, outside the scientific/statistically literate community. Typically the comment on the draft is "what's exceedance, it sounds scary and I don't understand it". Importantly also, its use on S.149 certificates would, we believe, seriously devalue coastal properties.

Our fall-back recommendation is that the term 'exceedance' be dropped, and the references to the four lines for 50 years risk assessment be as follows:

- *The shoreline which erosion has a 90% possibility of reaching in 50 years.*
- *The shoreline which erosion has a 50% possibility of reaching in 50 years.*
- *The shoreline which erosion has a 10% possibility of reaching in 50 years.*
- *The shoreline which erosion has a 1% possibility of reaching in 50 years.*

The use of 'possibility', rather than 'likelihood' or 'probability', in these descriptions is appropriate in view of the compounded uncertainties in coastal hazard studies.

Paul Flemming.

Spokesperson for Lake Cathie Coastal Residents Group.

[REDACTED]

From: [REDACTED]
Sent: Sunday, 28 February 2016 5:39 PM
To: OEH PD Coastal Reforms Mailbox
Cc: Angus Gordon; Bruce Thom; Bruce Coates
Subject: 262 (Part 4 of 4)_Flemming_280216: Submission on the draft Coastal Management Bill 2015 - Clause 28, erosion and accretion

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Despite its title, Clause 28 of the Bill, *Modification of doctrine of erosion and accretion*, addresses accretion but not erosion. The draft clause makes no reference to the title status of land lost to erosion. This is surprising, because the accretion issue will rarely arise, whereas the erosion issue has commenced, for example at Old Bar, and is likely to increase with sea level rise, possibly in large measure.

For those faced with the onset of coastal erosion on their seaward boundaries, two elements in the drafts are most welcome and heartening. The first is the intention to *manage retreat in such a way that people can enjoy their property for as long as possible before having to retreat as their current location becomes non-viable* (draft Manual, Part B, Stage 3, page 18). The second is the replacement of CPA 1979 Section 55M with Clause 27 in the Bill. This change means that, providing the submitted coastal protection works will not unreasonably limit public use of the associated beach, nor threaten public safety, and those proposing the work make the required undertakings, privately funded and executed protective works will be possible.

However, this possibility makes it essential that there be clarity as to the retention of 'fixed' or 'right line' boundaries as eroding private land becomes beach, upon which protective works, qualifying for approval, are to be built. Accordingly, it is recommended that Clause 28 be expanded to address erosion as well accretion, and that an additional clause or clauses be added to ratify 'right line' boundary retention, thereby ensuring that the above welcome intentions can be realised in practice.

Paul Flemming.

Spokesperson for Lake Cathie Coastal Residents Group.