

**TECHNICAL REPORT** Investigations and Monitoring Group

**Process and outcomes of  
the Nitrogen Allocation  
Reference Group (NARG)  
for the South Canterbury  
Coastal Streams area**

**Report No. R14/110**

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**ISBN 978-0-908316-15-1 (print)  
978-0-908316-17-5 (web)**

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December 2014





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## **Executive Summary**

The purpose of this report is to record the process and key elements of the consensus agreement reached by the Nitrogen Allocation Reference Group (NARG) on a preferred option for a nitrogen (N) allocation framework for the South Canterbury Coastal Streams (SCCS) area.

The NARG was established in March 2014 and comprised members of the local community including those with farming interests (e.g., irrigated and non-irrigated arable, dairy, sheep and beef, and vegetable farmers), runanga representatives and those with general community interests. The agreed purpose of the NARG established at the first meeting was:

*To work with Environment Canterbury (ECan) to assess and describe the consequences of different options for allocating N load in the South Canterbury Coastal Streams (SCCS) area*

The NARG subsequently spent five months considering, with intensive collaborative effort, a range of N allocation options, eventually reaching an agreed position on a preferred option in July 2014.

This report describes:

- The roles of the NARG group, the Zone Committee, Environment Canterbury technical staff, facilitators and local leaders;
- The evolution of the NARG process and a record of all the meetings;
- An overview of the nitrogen allocation options considered and the pros and cons of each option;
- A record of the technical material provided to inform discussion and debate;
- The key elements of the N allocation framework ultimately agreed by consensus (see below);
- The final NARG agreement and the N allocation framework carried through by the Zone Committee to publish in its Zone Implementation Programme (ZIP) Addendum;
- A record of media responses and articles written expressing views on the process after the NARG agreement was reached;
- A discussion section containing observations that may be useful, with hindsight, for other community groups and associated technical advisors, planners and facilitators embarking on collaborative processes to make decisions on nitrogen allocation.

Key elements of the agreed N allocation framework are:

- The requirement for all land users to achieve a minimum of Good Management Practice (GMP);
- “Maximum caps” that are based on soil type and that require high N emitters to reduce N loss to better than GMP, through time;
- A “flexibility cap” for low N emitters that increases through time as flow augmentation is implemented for Wainono Lagoon, and as N-loss reductions by high emitters are realised as a result of the maximum caps.





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## **1 Purpose**

The purpose of this report is to record key elements of the consensus agreement reached by the Nitrogen Allocation Reference Group (NARG) on a preferred option for a nitrogen (N) allocation framework for the South Canterbury Coastal Streams (SCCS) area.

In this report we focus particularly on recording the process and the 'intent' of each element of the agreed N allocation framework, so that when new information becomes available (e.g., updated N-loss 'look up table' estimates from the Matrix of Good Management (MGM) project scheduled for completion in mid-2015, updated versions of Overseer, soil maps and/or land use), this report may assist with revising the N allocation framework numbers to achieve the same intent, both for environmental outcomes and for resource users.

An additional purpose is to provide a reference base for other communities and resource management professionals who may embark on a similar process, so that lessons can be learned and further improvements made to such processes of collaborative limit setting and nutrient allocation.

## **2 Background**

From late 2012 and through 2013 Environment Canterbury (ECan) and the Lower Waitaki Zone Committee (ZC) ran a collaborative community-involved process that explored numerous future scenarios and possible solutions for land and water management in the SCCS area. By February 2014 they had prepared a Draft Zone Implementation Programme Addendum (ZIP Addendum) that documented a preferred approach. The Draft ZIP Addendum included, amongst numerous other recommended actions, draft catchment N load limits and an N allocation framework. That draft N allocation framework was based largely on work by the Primary Sector Group for the Selwyn Waihora Zone in 2013 (see Appendix 8) but was adjusted to suit the circumstances in the SCCS area.

At a meeting of the ZC on 19 February 2014, when the ZC was considering whether to sign off on their ZIP Addendum and forward it to Environment Canterbury Commissioners for approval, a self-organised group of around 80 local farmers voiced their discontent with the process and requested that sign-off on the Draft ZIP Addendum be postponed. In particular the group expressed dissatisfaction with the N allocation framework, and concern about lack of equitability of the framework for low emitters of N compared to high emitters. In response the ZC did not sign off on the ZIP Addendum and instead requested more time from the Environment Canterbury Commissioners to work through the N allocation issue. It was clear that the issue in dispute was the method of N allocation amongst users, rather than the setting of the total catchment N load limits to achieve environmental outcomes. The latter was not disputed.

The Environment Canterbury Commissioners subsequently approved a time extension for the ZC and Environment Canterbury staff to run a process to work through options for resolving the outstanding N allocation issue.

## **3 Establishing a Nitrogen Allocation Reference Group (NARG)**

A group (the 'NARG') was established comprising willing members of the local community including those with farming interests (e.g., irrigated, non-irrigated, arable, dairy, sheep and beef, vegetables), runanga representatives and those with general community interests. The agreed purpose of the NARG, as established at the first meeting (19 March 2014), was:

*To work with ECan to assess and describe the consequences of different options for allocating N load in the South Canterbury Coastal Streams (SCCS) area*

It was acknowledged at the first NARG meeting that some people in the community, in particular many farmers with low N emissions, had not had the chance to understand what the N limits and N allocation framework would mean for them. There was an acknowledged need for a step back to take everyone through the background information. The previous draft N allocation framework was put to the side and all N allocation options were brought back on to the table for a fresh discussion.

Environment Canterbury staff suggested at the first meeting that the initial intention of NARG would be to reach agreement about the technical basis for making decisions on N allocation, even if it was not possible to reach full agreement on what the decisions should be. Environment Canterbury staff suggested there would be no perfect answer and stated there was no expectation at the outset that the NARG would reach a consensus view on N allocation. As time would show, reaching consensus became a possibility later as the process evolved. The process improved through time in response to the NARG's increasing willingness to engage and problem solve.

## **4 The roles of NARG and others**

The roles agreed at the first NARG meeting (19 March 2014) were:

- The Zone Committee (ZC) was responsible for making decisions on the content of the ZIP Addendum which would include recommendations on N allocation to Environment Canterbury Commissioners. The Commissioners and the two District Councils (Waimate and Waitaki) would ultimately be responsible for accepting those recommendations and Environment Canterbury would attempt to incorporate the recommendations into an RMA regional plan.
- The NARG's role was to work with Environment Canterbury staff to describe and assess options for allocating N, and to express views either individually or (preferably) as a group, back to the ZC for consideration.
- The Environment Canterbury technical team (and indeed any technical contributors for stakeholders such as Dairy NZ and other industry staff) had the role of objective information providers. The technical role was to be performed transparently and free of agenda for any particular option or party, and according to the *NZ Environment Court's Code of Conduct for expert witnesses*.

A fourth 'facilitator' role became more important as the process evolved. In the beginning the discussion and debate was "around the table" and not formally facilitated towards achieving consensus. However as relationships and trust were built the NARG invited Environment Canterbury to facilitate consensus building. This facilitator role was not assumed but was performed in each case on check of invitation from NARG, and in the end was very important in achieving consensus.

Finally, and crucially, the role of local leaders increased as the process evolved, with several local farmers stepping up to lead discussions, facilitate off-line meetings and behind the scene discussion and negotiation, and bring compromise solutions back to the table. It is highly unlikely that quality debate, and ultimately consensus agreement, would have been achieved without this local leadership and its importance cannot be over-stated (see Appendix 7).

It is also worth noting here that the decision to allow a time extension to accommodate the NARG process enabled the roles described above to evolve. At the time that decision was made (March 2014) the likelihood of reaching consensus seemed remote, but the value of taking time to develop common understanding, even if not agreement, was recognised. This aspect is discussed further later in section 8.

## **5 The process**

Following establishment of the NARG group and roles, the 'process' was essentially a series of organised meetings and workshops, combined with extensive communications among participants, Environment Canterbury staff and other information providers, by email, phone and numerous informal smaller meetings. The key organised meetings are listed in Appendix 1. In brief these were:

- Ten formally recorded meetings held in Waimate Community Centre, open to anyone wishing to participate or observe. The meeting dates were circulated by email to a list of those having expressed interest and were also posted on the SCCS project website<sup>1</sup>. Material presented and/or discussed at meetings was posted on the project website after each meeting;
- Several additional meetings were held by sub-groups of the NARG to progress conversations that were subsequently brought back to the NARG group at the formally recorded meetings. These included two full NARG meetings without facilitation or Environment Canterbury staff present;
- Two meetings included presentations by Otago Regional Council staff on the Otago regional planning approach, and the national level Land and Water Partnership on their deliberations on N allocation, so that the local NARG was informed of evolving discussions on N allocation in neighbouring Otago and nationally.
- Five meetings of the Lower Waitaki Zone Committee (ZC), at which regular progress update reports were given by Environment Canterbury staff to the ZC and feedback received. These were public ZC meetings and at times NARG members were able to communicate directly with the ZC so that discussion could occur and feedback returned from the ZC to the NARG process.

The whole process evolved somewhat organically as relationships and understanding improved through time. With hindsight, three phases can be recognised as follows:

**1) The early meetings – generating common understanding of the information (Meetings 1 to 4; March to April)**

- i) Explanation was given by technical staff on how current and future N loads were estimated by using GIS-based land use maps, soil maps and the interim Canterbury Look-up Tables (LUT) (Lilburne *et al.*, 2013). A worked example was provided for the Otaio catchment.
- ii) Feedback was sought and received from NARG on errors noticed in the land use and irrigation maps. These were corrected for the subsequent analyses.
- iii) Technical staff, in collaboration with local farmers and Ravensdown staff (e.g. Arno Hall meeting on 12 March 2014), completed soil maps for the hill areas not previously covered by the national (S-Map) database, and derived Overseer® N-loss estimates for those soil types to supplement the LUT (see Lilburne 2014 and Fietje 2014).
- iv) A reading list was provided to NARG (Appendix 9) along with a summary paper called *Guidance on Allocation Decision Making* (Harris 2012) and a workshop dedicated to going through this paper (Meeting 2: 10 April 2014)
- v) A starting list of allocation principles was developed with the NARG (Meeting 3: 30 April 2014 – see Appendix 5) to help guide subsequent discussions on finding the most appropriate method of N allocation for the local situation. The principles were based on a blend of those developed in the preceding Selwyn Waihora process and a draft list of guiding principles provided by the national level Land and Water Partnership (LWP), who were deliberating N

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<sup>1</sup> <http://ecan.govt.nz/OUR-RESPONSIBILITIES/REGIONAL-PLANS/REGIONAL-PLANS-UNDER-DEVELOPMENT/SOUTH-CANTERBURY-COASTAL-STREAMS/Pages/workshops-public-mtgs.aspx>

allocation options at the national level at the same time as the NARG process. The LWP has also subsequently released a draft (November 2014 version) list of guiding principles (see Appendix 5).

**2) *The middle meetings – assessing a spectrum of N allocation options (Meetings 5 to 8; April to June)***

- i) The NARG organised and hosted a public meeting (see Appendix 1; Meeting 4: 13 May 2014) at which the Land and Water Partnership (LWP) outlined the range of N allocation options being considered around the country and their preliminary views on those options. The LWP also outlined their national level discussion and attempt to reach consensus amongst industry groups at the national level on a preferred N allocation approach. The LWP resolved at this meeting to attempt to land such a consensus agreement by 8 July 2014 in time for the NARG's deadline to report back to the Lower Waitaki ZC (16 July 2014). This national level consensus agreement did not eventuate but the concepts and discussion provided by LWP assisted the NARG in developing its own local-level solution.
- ii) The technical team provided information initially on a range of (seven) N allocation options for the NARG to consider (see Appendix 4; Presentation for Meeting 5: 15 May 2014) which included all the options described by the LWP at Meeting 4.
- iii) The NARG invited Otago Regional Council staff (see Appendix 1; Meeting 6: 4 June 2014) to present on Otago Regional Council's Water Quality Plan Change (6A) and approach to nutrient limits and allocation.
- iv) The NARG refined the long list of seven options to a short-list of three and requested more detailed information from the technical team on these options, which was subsequently provided (see Appendix 4; Presentation for Meeting 6: 4 June 2014).

**3) *The final meetings – facilitated consensus (Meetings 9 to 10; July)***

- i) The three short-listed options were debated. While individuals within NARG voiced preference for different options (in general high emitters favoured Option 1 and low emitters favoured Option 2), when questioned as to the option most likely to achieve consensus, all eventually agreed that Option 1 was most likely to achieve consensus provided that it could be adjusted sufficiently to address the concerns of the low emitters.
- ii) The technical team subsequently provided further information on adjustments that could be made to Option 1 to address the low emitters concerns; i.e., appropriate 'flexibility caps' and 'maximum caps'. These two types of caps essentially interact such that the lower the maximum caps (in kg N/ha/yr) that can be achieved by the high emitters, the greater the 'headroom' created and therefore the higher can be the flexibility cap (also in kg N/ha/yr) provided to the low emitters (see Appendix 4; Presentation for Meeting 8: 25 June 2014).
- iii) A small breakout group met on 30 June 2014 to discuss a farmer-proposed maximum cap system based on soil type. Representatives of the 'high emitter' group made an offer of soil-based maximum cap numbers they assessed they could live with. Negotiation ensued with representatives of the 'low emitter' group and a loose agreement was reached on possible maximum caps to bring back to the NARG.
- iv) The technical team subsequently provided further information to help reconcile the proposed maximum caps with the amount of headroom needed to achieve different increases to flexibility caps for low emitters. The technical team also prompted discussion about timeframes for farmers to adjust to new maximum caps and flexibility caps, and the interaction of these timeframes with the timeframe for achieving environmental outcomes. (see Appendix 4; Presentation for Meetings 8 and 9: 2 July 2014).

- v) At the final NARG meeting 10 (9 July 2014) the group focussed on wording for a joint statement to deliver to the ZC. The agreed statements were written up first and the “agree to disagree” matters (the size of the maximum caps and the flexibility caps, and the timing for both of these) remained disputed until, literally, extra time called after an evening cup of tea. The consensus position wording is provided in Appendix 2.
- vi) The NARG consensus position was incorporated into the ZIP Addendum and was passed by the Zone Committee on 16 July 2014 in the Waimate Community Centre. Most members of the NARG were present to witness the ZC discussion and the unanimous carrying through of the NARG agreement. The only wording change made from the NARG position to the ZIP Addendum was the addition of a sentence to clarify how the “steep hill” areas would be addressed (see third sentence in Table B of Appendix 3). This merely formalised what had been discussed during the NARG process and no-one at the ZC meeting on 16 July 2014 voiced opposition to this addition.
- vii) The Environment Canterbury Commissioners accepted the ZIP Addendum on 24 July 2014.
- viii) The Waimate District Council accepted the ZIP Addendum on 16 September 2014.
- ix) The Waitaki District Council accepted the ZIP Addendum on 17 September 2014.

## **6 Overview of N allocation options considered**

It is not possible to do full justice to the many detailed discussions on the options considered. However the key aspects of the ‘long list’ of seven options are summarised in the presentation for Meeting 5 (see Appendix 4). The key implications of the three short-listed options are summarised in the presentation for Meeting 6 (see Appendix 4). In brief these are as follows:

### ***Option 1: GMP based on land use plus a Flexibility Cap (plus a Maximum Cap)***

#### ***Description***

- This option makes use of the MGM project numbers when they become available (mid-2015).
- All land users outside the irrigation schemes must achieve GMP N-loss for the land use they were doing during the 2009-13 baseline period.
- Consented schemes (HDI & WD) land users can increase N-loss beyond their 2009-13 baseline, up to their limit (but at GMP).
- The Flexibility Cap allows for low emitters to change or intensify land use (at GMP) up to the Flexibility Cap.
- A Maximum Cap was also ultimately added to this option which sets a maximum leaching rate (see next section for a description of the key elements of the agreed framework).

#### ***Pros***

- This is the least disruptive of the three options, including economically, as it starts from current land use.
- Does not require trading and transfer to operate the system.
- Will require trading and transfer to optimise the system (i.e. could develop over time).
- Provides for specific development within irrigation schemes.
- Gives low leaching operations outside schemes a degree of flexibility.
- Constrains high leaching operations to at least GMP, and if Maximum Caps are added then this option requires better than GMP for high leaching operations, particularly on light soils (see next section for more detailed explanation).



**Cons**

- This option requires land users to define their baseline 2009-13 land use – there is potential for gaming this aspect of the system.
- Requires review and recalculation of catchment N loads when MGM project numbers become available
- Requires a system for periodic updating of MGM numbers and versions of Overseer® - it is not yet clear how this will be taken into account.
- The Flexibility Cap and Maximum Cap threshold numbers may change on review following MGM numbers being available and with updated versions of Overseer®.
- The original version of this option had a Flexibility Cap that was fixed (at 10 kg N/ha/yr) thus constraining opportunities on low leaching land indefinitely.

**Option 2: Modified equal allocation**

**Description**

- This option divides the catchment up into zones according to level of productivity (e.g. 'steep hills', Non-Productive Land (NPL), and 'the rest').
- The total annual load for each zone is calculated and then divided by the number of hectares in the zone to give an average load per hectare.
- Everyone in each zone receives the same average load allowance – i.e. an equal allocation nutrient discharge allowance (NDA).

**Pros**

- This gives low leaching operations the greatest flexibility (of the three options) by allowing intensification or change up to the NDA.

**Cons**

- This is initially the most disruptive of the three options, including economically.
- Requires a trading and transfer mechanism immediately to operate the system (and to optimise it).
- Restrictive for high leaching operations as it requires mitigation or land use change or trading for high emitters to continue operating.
- Does not provide for specific development within the new (HDI and WD) irrigation schemes.
- Under this option there is likely to be unused allocation – which is negative from an economic efficiency perspective but positive from an environment perspective.
- Requires a system for periodic updating of MGM numbers and versions of Overseer® - it is not yet clear how this will be taken into account.

**Option 3: GMP based on soil and climate (but not current land use)**

**Description**

- This option involves defining a land use such that if everyone did it, the catchment load would not be breached.
- Everyone receives the load that the Look-Up Tables (or MGM numbers) suggest their property would lose if they did that land use on their soil and climate type.
- Under this system the N allocation is higher for properties with greater soil N loss vulnerability.
- For the Waihao-Wainono catchment it was identified that land use would be (approximately) Dairy 3 cows/ha wintered on (Note: Subsequent to the NARG process it has been identified that this land use was in fact too high and resulted in the catchment load limit being exceeded – the reassessed land use that would be possible under this option was Sheep and Beef (20% Beef) – Linda Lilburne pers. comm., November 2014).

**Pros**

- Initially this causes the middle level of disruption of the three options, including economically.
- This gives currently low leaching operations on high vulnerability soils (e.g. light soils) flexibility by allowing intensification or change up to the NDA.

- Restrictive for some high leaching soil/climate combinations as will require mitigation or trading for those users to continue operating. (NB: However this option is less restrictive in this regard than Modified Equal Allocation).

***Cons***

- For the Waihao-Wainono catchment the land use specified is very dependent on the assigned load for Poorly Drained (Pd) class because this class is such a large proportion (35%) of the area. This could change with MGM and require reassessment with.
- Probably will require trading and transfer to operate the system (and optimise)
- Does not provide for specific development within the new (HDI and WD) irrigation schemes.
- There is likely to be unused allocation – which is negative from an economic efficiency perspective but positive from an environmental perspective.
- Requires a system for periodic updating of MGM numbers and versions of Overseer® - it is not yet clear how this will be taken into account.

The pros and cons of all N allocation options are summarised in the table in Appendix 11.

## **7 Key elements of the consensus agreed N allocation framework**

The NARG ultimately achieved a strong level of consensus in rejecting the two extreme options at either end of the range (i.e., grand-parenting and simple averaging). Consensus was achieved on a combination option (the 'agreed position') that provides some flexibility for low emitters, time for high emitters to reduce their loss rates, and gradually moves towards a type of modified equal allocation through time.

Key elements of the agreed framework (see Appendices 2 and 3) are as follows:

### **1) Good Management Practice (GMP)**

A cornerstone of the agreed framework is the requirement for all land users to achieve a minimum of GMP, as to be defined in the Matrix of Good Management (MGM) Project scheduled for completion in July 2015, both in narrative description terms and as an expected N loss rate in kg/ha/yr for conceivable combinations of land use, soil type and climate class.

For the purpose of the NARG process the technical team used the latest available interim estimate of these expected N loss rates (i.e., the LUT Overseer® V6 Patch; Lilburne *et al.*, 2013 [and SCCS-specific modifications made in Lilburne 2014] – see Appendix 10). The NARG's consensus recognised that these interim numbers would eventually be superseded by the MGM numbers using later versions of Overseer®, and that the NARG framework numbers would be updated if necessary via a process that would review and check that the revised framework achieved a consistent intent. Part of the purpose of this report is to document the intent of the Maximum Caps and Flexibility Caps (see below) so that such a review can occur efficiently.

It will also be necessary to review the calculation of the catchment N load limits as these too are based on the interim LUT Overseer® V6 Patch numbers. Such a review can be guided by the calculation formulae (and land use map assumptions) shown in the footnotes of the load limit table (see table A in Appendix 3)

### **2) Maximum Caps**

The agreed Maximum Caps vary by soil type and are shown in Table C of Appendix 3. These were effectively negotiated between representatives of the high emitters (who pay the cost of compliance with Maximum Caps) and the low emitters (whose opportunity to increase (i.e. 'flexibility') improves if Maximum Caps are lower). Importantly the Maximum Caps in Table C were agreed based on the LUT (Appendix 10) and the associated following understanding at the time:

- i) A Maximum Cap of 35 kg/ha/yr for the light soil classes equates to allowing for land use intensity (at GMP) of up to 4 cows/ha wintered off on light (L) soils, and 3 cows/ha wintered off on very light (VL) soils, but requires better than GMP for dairying on extremely light (XL) soils (see LUT in Appendix 10)<sup>2</sup>.
- ii) A Maximum Cap of 25 kg/ha/yr for the medium soil classes (M, H, D) requires better than GMP for dairy at 4 cows/ha or greater (see LUT in Appendix 10).
- iii) A Maximum Cap of 20 kg/ha/yr for the poorly drained soil classes (Pd, Pdl), allows up to 5 cows/ha at GMP (see LUT in Appendix 10).
- iv) The above Maximum Caps, if fully implemented by all current land users and new scheme users, would create sufficient 'headroom' (compared to everyone operating at GMP without

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<sup>2</sup> Note that the LUT in Appendix 10 is for the 650mm rainfall zone which represents the vast majority of the SCCS area within which the Maximum Caps would be likely to apply (see Lilburne, 2014). Areas in greater rainfall classes (e.g. 650-750 mm and 750 mm+ classes) are in the steep hill country and upper Waihao North Branch where the Maximum Caps are unlikely to be an issue for land users to comply.

Maximum Caps) to allow the Flexibility Cap for low emitters to be lifted from 15 kg/ha/yr to 17 kg/ha/yr, and assuming that mitigation measures such as augmentation are effective for mitigating nutrient loads and achieving outcomes in Wainono Lagoon.

- v) The above Maximum Caps will impose costs on high emitters but this was accepted as the NARG (and community members that attended meetings) felt that the highest leaching rates were unacceptable.

### **3) Flexibility Caps**

The agreed Flexibility Caps and their staged timing are shown in Table B of Appendix 3. The negotiation of these was linked to (and dependent on) negotiation of the Maximum Caps as described above. These were based on the following understanding at the time

- i) If flow augmentation does not occur then the Waihao-Wainono catchment cannot accommodate any more N load and achieve ZIP Addendum-defined outcomes for Wainono Lagoon (e.g., a Trophic Level Index score of 6 or better). In this circumstance the Flexibility Cap must remain conservatively at 10 kg/ha/yr.
- ii) If HDI and WD schemes go ahead as consented and augmentation occurs, the increased N load associated with gradual intensification and dryland dairy support activities assumed necessary to support the additional scheme area dairy platform equates to a total catchment N load (of about 200 t/yr for Waihao-Wainono catchment; Lilburne, 2014) which, if distributed evenly amongst low emitters (excluding steep hill country) is sufficient to lift the flexibility cap to approximately 15 kg/ha/yr.
- iii) When the agreed Maximum Caps are achieved as discussed above, the Flexibility Cap may be lifted further to 17 kg/ha/yr. However in acknowledgment of the uncertainty associated with all the technical assessments and to reduce further risk on the environment, this lift in the Flexibility Cap was agreed to be contingent on monitoring showing (in 2025) that ZIP Addendum-defined water quality outcomes are being achieved. The technical authors note here that the NARG discussion was primarily around meeting water quality outcomes in Wainono Lagoon which is appropriate for considering the merits of lifting the flexibility cap to 17 kg/ha/yr for that catchment. It is logical that water quality outcomes defined for the northern streams catchments (Otaio, Kohika, Horseshoe Bend and Makikihi) would be compared when considering the merits of lifting the flexibility cap in each of those catchments.
- iv) If the Wainono Lagoon (and northern stream) water quality outcomes are not being met by 2025 when the agreed Maximum Caps have been achieved then the question was raised as to whether the Maximum Caps could be reduced further to help provide for the lift in Flexibility Cap to 17 kg/ha/yr. There was discussion on this topic but no agreement was reached on a definite course of action in 2025 if this situation arises. Rather it was accepted that the situation should be reviewed at that time, including the potential for technology improvements in the intervening period that may allow further reductions in N loss. This is reflected in the wording of the final paragraph in the NARG Agreement (see Appendix 2).
- v) The land uses understood at the time to be enabled by flexibility caps at 10, 15 and 17 kg/ha/yr are those shown in the LUT in Appendix 10.

### **4) Steep hill country**

It was agreed to separate the 'steep hill' country (defined in mapping terms as the area covered by soil classes 'Hurunui' and 'Class 7'<sup>3</sup> – see Appendix 6) and assign an appropriately low flexibility cap of 5 kg/ha/yr. This was an important part of the framework that allowed the flexibility cap for non-steep hill areas to increase from 10 to 15 kg/ha/yr, as described above. If the assumed flexibility load described above had to be distributed across the entire area (including steep country), it would have been

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<sup>3</sup> Note that this definition of 'steep hill' area produces a map that aligns very closely with hill country land that is steeper than about 15 degrees.

significantly 'diluted' such that the flexibility cap would only have increased slightly rather than lifting to 15 kg/ha/yr. It was assumed that steep hill country land users could average their 'steep hill' losses across their 'steep hill' area (but not outside that area) in order to stay within the 5 kg/ha/yr as an average. It was assumed this would be manageable given typical loss estimates for that country were less than 5 kg/ha/yr, and would allow for the possibility that relatively small areas within the mapped 'steep hill' area may be suitable for uses with higher N-loss rates than 5 kg/ha/yr.

The mapping boundary of the 'steep hill' area (see Hurunui and Class 7 areas in Appendix 6), its implications for hill country farmers, and whether the implications are manageable as assumed above, has not been investigated in detail beyond the collaborative NARG process described here. This may be a subject for further discussion as the SCCS project proceeds and feedback is sought on the proposed planning framework.

## **8 Discussion**

The NARG process was by no means perfect. The very need for it arose out of a failure to initially achieve complete community engagement with the SCCS limit setting process, which needed fixing. However from the perspective of the technical and planning team who have authored this report, the NARG process was ultimately successful in that it:

- Eventually achieved a strong level of community engagement;
- Increased the level of understanding of the technical information base, and the uncertainties with that information, on which decisions need to be made;
- Brought local farmers together to debate the issues and find local solutions for meeting the N load limits that are designed to achieve the common goal of environmental outcomes;
- Brought to the table most of the conceivable N allocation options available at the time;
- Allowed differing views and opinions to be heard and understood, thus increasing understanding of the implications of each of the various options for others;
- Stimulated creative local problem solving that added a new feature to the N allocation options not previously considered in Canterbury – the soil-based Maximum Cap system;
- Achieved a strong level of consensus on rejection of the two extreme options (grand-parenting and simple averaging);
- Achieved consensus on a combination option (the 'agreed position') that provides some flexibility for low emitters, time for high emitters to reduce their loss rates, and gradually moves towards a type of modified equal allocation through time;
- Acknowledges that everyone did not get exactly what they would have preferred, but that everyone got something they could apparently live with.

To illustrate other views of success by NARG participants we have included various media articles that emerged in the week or two after the final agreement meeting (in Appendix 5) and two papers prepared by NARG participants for a subsequent Federated Farmers newsletter (Colin Hurst) and the New Zealand Association of Resource Management conference (William Rolleston) in Appendix 7.

After reaching consensus on the agreed framework (Appendix 2) some NARG members still voiced their preference for their own favoured option (e.g., see the view of Roger Small in Appendix 5) and this was respected. However there seemed to be a reasonable degree of respect for the NARG process, acknowledgement that everyone round the table had been heard, and that a compromise had been reached.

The technical team perceived a feeling by most participants that an agreed position was a more powerful statement to take to the ZC and Environment Canterbury Commissioners than a stalemate, and that the agreed position had a chance of making it through the statutory plan development process whereas a stalemate left decisions open for later decision-makers and thus created uncertainty of outcome for the NARG. The technical team perceived this was a motivating factor that helped incentivise the NARG reaching agreement.

There also seemed to be a genuine feeling amongst participants at the final meeting, of a sense of achievement that follows satisfactory completion of something very difficult. The NARG's agreed position was wholly endorsed by the ZC and accepted by resolution into the final agreed ZIP Addendum at the ZC meeting on 16 July 2014.

The technical team observed that local leadership, which emerged during the formal meetings and also during extra meetings without Environment Canterbury staff or facilitation, was critical in developing discussions and negotiations between those with differing points of view. In the end this local leadership was instrumental in getting to an agreed consensus position.

It is also useful with hindsight to examine the decision made in March 2014 to allow a time extension to accommodate development of the NARG process. At the time that decision was made the likelihood of reaching consensus seemed remote, but the value of taking time to develop common understanding, even if not agreement was recognised. It took several months right up to the time deadline (July 2014) before it was apparent that a consensus agreement was even possible. With the benefit of hindsight, had the time extension not been given, a less acceptable solution would have been included in the ZIP, and the energies of disenfranchised people would have been directed against the ZIP and then also the subsequent plan development process. The learning that can be taken from this is that because limit setting is a social process rather than a technical science process it is important to have some flexibility to respond to the social needs, in order to realise the full potential benefits of the process. Undoubtedly time deadlines are also important to incentivise the hard decisions to be made, but judgement on the use of deadlines is crucial.

There are lessons to be taken perhaps for other areas looking to make local decisions on N allocation. The key aspects of the SCCS NARG process have been documented here partly to help inform subsequent processes. However we note that the SCCS process was not one which followed a recipe laid out in detail from the beginning. Rather the process evolved continuously in response to the needs encountered as relationships developed, understanding of the technical information increased, and local debate and problem-solving occurred.

## **9 Acknowledgements**

The report authors are grateful for review comments by Colin Hurst, Roger Small, William Rolleston and Tim Davie.

## **10 References**

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## **Appendix 1: List of meetings during the NARG process**

### ***Advertised full NARG workshop meetings***

Meeting 1: 19 March 2014  
Meeting 2: 10 April 2014  
Meeting 3: 30 April 2014  
Meeting 4: 13 May 2014  
Meeting 5: 15 May 2014  
Meeting 6: 4 June 2014  
Meeting 7: 11 June 2014  
Meeting 8: 25 June 2014  
Meeting 9: 2 July 2014  
Meeting 10: 9 July 2014

### ***Advertised invited speaker meetings***

13 May 2014: Land and Water Partnership presentation on national progress resolving N allocation options and considering preferred national approach. Speakers: Ian Mackenzie (Chair Land and Water Partnership), Chris Keenan (Horticulture NZ), Andrew Curtis (Irrigation NZ), Lionel Hume (Federated Farmers), James Ryan (Dairy NZ), Ben O'Brien (Beef and Lamb NZ), also local NARG members Colin Hurst and Roger Small.

4 June 2014: Otago Regional Council's Water Quality Plan Change (6A) and approach to nutrient limits and allocation. Speaker: Matt Hickey – Manager Resource Science

### ***Breakout group meetings***

18 June? 2014: Waimate Community Centre: Ned Norton, Colin Hurst, Roger Small, Lionel Hume

25 June? 2014: Waimate Community Centre: Ned Norton, Colin Hurst, Roger Small, John Gardiner, David Gardiner, Keith Adams, Chrissie Adams

20 May 2014: Federated Farmers Office Ashburton: Ned Norton, Colin Hurst, Lionel Hume

30 June 2014: St Andrews – Ross Rathgen's house: Ned Norton, Roger Small, Brian Ellwood, Ross Rathgen, Gert Van't Klooster, Bruce Murphy, John Linton, Colin Hurst (remote message)

### ***Lower Waitaki Zone Committee meetings where NARG issues discussed***

19 March 2014 – Waimate Community Centre  
16 April 2014 – Waimate Community Centre  
21 May 2014 – St Andrews Hall  
18 June 2014 – Waimate Community Centre  
16 July 2014 – Waimate Community Centre



## Appendix 2: NARG Final Agreement

### Consensus Position on Nitrogen Allocation in South Coastal Canterbury Nitrogen Allocation Reference Group – Agreed 9<sup>th</sup> of July

Framework = Good Management Practice with a Flexibility Cap and a Maximum Cap <sup>4</sup> Waihao Wainono and Northern Streams		
<b>2015</b> <b>Step 1</b>	Working to Good Management Practice for all users as per the MGM Project  Flexibility cap of 10kgs/ha/yr for low emitters in Waihao Wainono and 15kgs in Northern Streams  Maximum Cap levels are clearly signalled and the timeframe for existing users to get there. New users meet the max cap from Step 1. (As per table below)	Plan Operative
<b>2020</b> <b>Step 2</b>	Good Management Practice for all users as per the MGM Project  Flexibility Cap in Waihao Wainono increases to 15kgs  A plan must be produced by existing high emitters to show progress and methods to get down to Maximum Cap by 2025. (New scheme users and new conversions must meet the Maximum Cap immediately)	If Hunter Downs and Augmentation have occurred
<b>2025</b> <b>Step 3</b>	Good Management Practice for all users as per the MGM Project  High emitters have reduced to the Maximum Cap  If water quality outcomes are being met, then the gains made from the Maximum Cap reductions are available to: <ul style="list-style-type: none"> <li>provide additional flexibility for low emitters to a target of 17kgs/ha/yr and</li> <li>provide for any existing high emitters on XL soils that are unable to meet the 35kgs maximum cap – by application for resource consent with a strong justification required</li> </ul>	Plan review

Maximum Cap for Waihao and Northern Streams	Soils	New Users (HDI + WD + any other new converters)	Existing Users	
35	XL, VL, L	Achieve immediately on conversion	Must prepare a plan by 2020 showing how to achieve	Achieve by 2025
25	M, H, D			
20	Pd, Pdl			

It was agreed that for **Morven and Sinclairs**, to protect water quality and provide flexibility for land use, this can be provided by ensuring land use is at GMP (as will be defined in the MGM project) and as any future N load reductions from border to spray occur these are managed by MGIS - as agreed already in the February 20<sup>th</sup> ZIP Addendum.

<sup>4</sup> NARG's consensus recognises that all above numbers are based on current look-up table Overseer 6, and would be re-visited for consistency of intent when future versions of Overseer and MGM come into play.

It was agreed to **no formalised trading** in this plan. It was recognised this may be a subject for the future. It was agreed that the **'farming enterprise'** provisions (i.e. managing N load across properties within the same operating unit) in the LWRP should be enabled in South Coastal Canterbury, provided that this occurs in the same sub-catchment. Moreover, there was agreement that these provisions should be extended to properties operating as a **formalised collective** (with multiple operating units), within the same sub-catchment.

It was agreed that the N allocation will need to be reviewed **in 2025 if water quality outcomes are not being met** (as per the current ZIP Addendum), moreover that there is no priority right implied to either high or low emitters as to where improvements beyond GMP would be required.

**The following were present and part of the 9<sup>th</sup> July Consensus**

John Linton	Colin Hurst
Keith Adams	John Hughes
John Gardner	Jeff Bleeker
Chrissy Adams	David Sleigh
Ross Rathgen	Odette Alexander
John Gregan (left before agreement)	Rob McIlraith
Bruce Murphy	Alastair Boyce
Gert Van T'Klooster	William Rolleston
Martin Jensen	Lionel Hume
(Roger Small – absent from final meeting)	

## **Appendix 3: N-Allocation framework inserted into Lower Waitaki ZIP Addendum**

The following is a direct quote cut-out from the Lower Waitaki Zone Implementation Programme Addendum (ZIP Addendum) that was passed by the Zone Committee on 16 July 2014 in the Waimate Community Centre. Most members of the NARG were present to witness the ZC discussion and the unanimous carrying through of the NARG Consensus Position (Appendix 1) as follows. The only wording change made to the framework tables from the NARG Consensus Position (in Appendix 1) was the addition of a sentence to clarify how the “steep hill” areas would be addressed (see third sentence in Table B (Step 1) below). This merely formalised what had been discussed during the NARG process and no-one at the ZC meeting on 16 July 2014 voiced opposition to this addition.

The Environment Canterbury Commissioners accepted the ZIP Addendum on 24 July 2014

The Waimate District Council accepted the ZIP Addendum on 16 September 2014

The Waitaki District Council accepted the ZIP Addendum on 17 September 2014

Appendix Two: Table A - Draft N-load limits for farming

Catchment	Timing	*#Load limit (t/yr)	What does this mean for environment outcomes?	What does this mean for land users?
<b>Waihao-Wainono</b> (Waihao, Buchanans, Sir Charles, Waimate, Waituna, Hook, Coastal Drains)	From April 2015	Existing use <sup>4</sup> @2015; 680 @2025; 680 minus max cap reductions	<ul style="list-style-type: none"> <li>Wainono water quality initially declines from <b>TLI 6.5 to 6.7</b> (assume only WD scheme proceeds before augmentation)</li> <li>Meets at least 90% protection for N-toxicity in streams</li> <li>N does not limit periphyton in all streams – reduce with riparian shading and increased flow</li> </ul>	<ul style="list-style-type: none"> <li>All users at GMP by 2017; Max Caps apply as per Table B &amp; C</li> <li>Flexibility cap allows N loss increase up to 10 kg/ha/yr</li> <li>No other increase in N loss is allowed unless the user has rights to part of the load allocated to a consented scheme</li> <li>Allows consented HDI &amp; WD land use change to get started</li> </ul>
	After augmentation (2020)	HDI & WD <sup>5</sup> 227 minus max cap reductions  Flexibility load <sup>6</sup> @2020; 214 @2025; 214 plus max cap gains <b>Total<sup>7</sup> = 1121</b>	<ul style="list-style-type: none"> <li>Can probably achieve Wainono target outcome <b>TLI 6.0</b></li> <li>Meets at least 90% protection for N-toxicity in streams</li> <li>N does not limit periphyton in all streams – reduce with riparian shading and increased flow</li> </ul>	<ul style="list-style-type: none"> <li>All users at GMP; Max Caps apply as per Table B &amp; C</li> <li>Flexibility cap increases from 10 to 15 kg/ha/yr</li> <li>Allows HDI &amp; WD land use change &amp; dryland dairy support</li> <li>All users benefit from augmentation because this reduces the possibility that load limit reductions and/or other regulatory changes could be considered if environmental outcomes are not being met at time of future plan review</li> </ul>
	From 2025		<ul style="list-style-type: none"> <li>Assuming all water quality outcomes are now met</li> </ul>	<ul style="list-style-type: none"> <li>All users at GMP and operating below Max Caps</li> <li>Flexibility cap increases to target of 17 kg/ha/yr</li> </ul>
<b>Northern Streams</b> (Otaio, Kohika, Horseshoe, Makikihi)	From April 2015	Otaio <sup>8</sup> = 169 Kohika <sup>8</sup> = 96 Horseshoe <sup>8</sup> = 51 Makikihi <sup>8</sup> = 145	<ul style="list-style-type: none"> <li>Meets at least 90% protection for N-toxicity in streams</li> <li>N does not limit periphyton in all streams – reduce with riparian shading and increased flow</li> </ul>	<ul style="list-style-type: none"> <li>All users at GMP by 2017; Max Caps apply as per Table B &amp; C</li> <li>Flexibility cap allows N loss increase up to 15 kg/ha/yr</li> <li>Allows for consented HDI land use change; any land use change or intensification that increases N loss above 15 kg/ha/yr prior to HDI will be by consent and will be accounted as part of the total allocation – HDI may utilise remaining available load up to the limit</li> </ul>
	From 2025		<ul style="list-style-type: none"> <li>Assuming all water quality outcomes are now met</li> </ul>	<ul style="list-style-type: none"> <li>All users at GMP and operating below Max Caps</li> <li>Flexibility cap increases to target of 17 kg/ha/yr</li> </ul>
<b>Morven - Sinclairs</b>	From April 2015	Morven <sup>9</sup> = 307 Sinclairs <sup>9</sup> = 61	<ul style="list-style-type: none"> <li>Meets current quality in Morvens &amp; Sinclairs</li> <li>N does not limit periphyton in all streams – reduce with riparian shading and increased flow</li> </ul>	<ul style="list-style-type: none"> <li>All users at GMP by 2017</li> <li>As N load reduces through time (by border-dyke to spray conversions) this load may be managed by MGI Scheme for land use change or intensification within catchment only</li> </ul>

\* Note all load limits include an allowance of up to 5 kg/ha/yr for all "steep hill" areas as defined by soil types Hurunui and Class 7 in the SCCS soil maps.

# Note load limits are draft placeholders based on 2014 Look-up Tables (Overseer Version 6) and will be re-calculated once GMP numbers (kg/ha/yr) are agreed via the Matrix of Good Management (MGM) Project.

<sup>4</sup> Calculated as Current land-use x GMP (kg/ha/yr) for 2015. For 2025 the existing load above Maximum Caps (see Tables B & C) has been subtracted.

<sup>5</sup> Calculated as Scenario 2 (HDI & WD) land-use x GMP (kg/ha/yr) minus the load above Maximum Caps; (Assumed land-use mix for new irrigation 70% dairy; 10% arable; 10% sheep, beef, deer; 10% dairy support) –The load will be allocated between HDI and WD in proportion to each scheme's area once the scheme areas have been finalized.

<sup>6</sup> Calculated for 2020 as the sum of assumed dryland dairy support (146t) and nominal 10% intensification (68t) components of Scenario 2 land-use. For 2025 load gains above Maximum Caps are added.

<sup>7</sup> Calculated as Scenario 2 land-use x GMP (kg/ha/yr); (Assumed land-use mix for new irrigation 70% dairy; 10% arable; 10% sheep, beef, deer; 10% dairy support)

<sup>8</sup> Calculated as Scenario 2 land-use x GMP (kg/ha/yr); (Assumed land-use mix for new irrigation 70% dairy; 10% arable; 10% sheep, beef, deer; 10% dairy support)

<sup>9</sup> Calculated as Current land-use x GMP (kg/ha/yr)

**Process and outcomes of the Nitrogen Allocation Reference Group (NARG) for the South Canterbury Coastal Streams area**

**Table B - Nitrogen allocation framework for farming.**

<b>Framework = Good Management Practice with a Flexibility Cap and a Maximum Cap Waihao Wainono and Northern Streams</b>		
<b>2015</b>  <b>Step 1</b>	<p><i>Working to Good Management Practice</i> for all users as per the MGM Project</p> <p><i>Flexibility cap</i> of 10kgs/ha/yr for low emitters in Waihao Wainono and 15kgs in Northern Streams.</p> <p>The flexibility cap for “steep hill” areas (defined as Hurunui and Class 7 soils) remains at 5 kg/ha/yr in all catchments from 2015 onwards.</p> <p><i>Maximum Cap</i> levels are clearly signalled and the timeframe for existing users to get there. New users meet the max cap from Step 1. (As per table below)</p>	<b>Plan Operative</b>
<b>By 2020</b>  <b>Step 2</b>	<p><i>Good Management Practice</i> for all users as per the MGM Project</p> <p><i>Flexibility Cap</i> in Waihao Wainono increases to 15kgs</p> <p>A plan must be produced by existing high emitters to show progress and methods to get down to <i>Maximum Cap</i> by 2025. (New scheme users and new conversions must meet the <i>Maximum Cap</i> immediately)</p>	<b>If Augmentation has occurred</b>
<b>2025</b>  <b>Step 3</b>	<p><i>Good Management Practice</i> for all users as per the MGM Project</p> <p>High emitters have reduced to the <i>Maximum Cap</i></p> <p>If water quality outcomes are being met, then the gains made from the <i>Maximum Cap</i> reductions are available to:</p> <ul style="list-style-type: none"> <li>provide additional <i>flexibility</i> for low emitters to a target of 17kgs/ha/yr</li> <li>provide for any existing high emitters on XL soils that are unable to meet the 35kgs maximum cap – by application for resource consent with a strong justification required</li> </ul>	<b>Plan review</b>

**Table C – Maximum Caps for farming**

Maximum Cap for Waihao Wainono and Northern Streams (kg/ha/yr)	Soils	New Users (HDI + WD + any other new converters)	Existing Users	
35	XL, VL, L	Achieve immediately on conversion	Must prepare a plan by 2020 showing how to achieve	Achieve by 2025
25	M, H, D			
20	Pd, Pdl			

**Process and outcomes of the Nitrogen Allocation Reference Group (NARG) for the  
South Canterbury Coastal Streams area**

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**Table D - Draft N-load limits for urban and industrial discharges.**

Catchment	Timing	Load limit (t/yr)	What does this mean for users?
<b>Waihao-Wainono</b>	From April 2015	40 (milk processing wastewater) 2 (Waimate community sewerage)	<ul style="list-style-type: none"><li>• Fonterra factory milk processing wastewater may continue within current total loading rate</li><li>• Waimate community wastewater treatment plant may continue within current total loading rate</li></ul>
<b>Northern Streams</b>	From April 2015	8 (potato processing wastewater)	<ul style="list-style-type: none"><li>• Makikihi factory potato processing wastewater may continue within current total loading rate</li></ul>
<b>Morven - Sinclairs</b>	From April 2015	0	<ul style="list-style-type: none"><li>• There are no existing urban or industrial discharges and no load is provided for new discharges</li></ul>

## **Appendix 4: NARG Meeting presentation material**

*This Appendix includes colour copies of all the slides, 6 to a page, for the following presentations:*

*Meeting 5 – N Allocation Options (long list of 7 options) - 30 slides*

*Meeting 6 – N Allocation Options (short-list of 3) – 35 slides*

*Meeting 8 – Closer Inspection of Option 1 – 21 slides*

*Meeting 9 – Seeking Consensus – 8 slides*

## Meeting 5 – N Allocation Options (long list of 7 options)

**Nitrogen Allocation Reference Group (NARG)**

**Meeting 5: N Allocation Options**

Ned Norbin, Simon Hamlin


15 May 2014  
Waimate Community Centre



**Purpose of this meeting**

*"To work with ECan to assess and describe the consequences of different options for allocating N load in the South Canterbury Coastal Streams (SCCS) area"*


1. Updated N load estimates
2. N-Allocation Options – with numbers
3. Begin Group Discussion



**First up – IMPORTANT – DRAFT !!!**


*"To work with ECan to assess and describe the consequences of different options for allocating N load in the South Canterbury Coastal Streams (SCCS) area"*

We are working hard to get numbers for your conversation – they are **DRAFT** – we reserve the right to find errors and make corrections – help work with us!!!



**Part 1.**


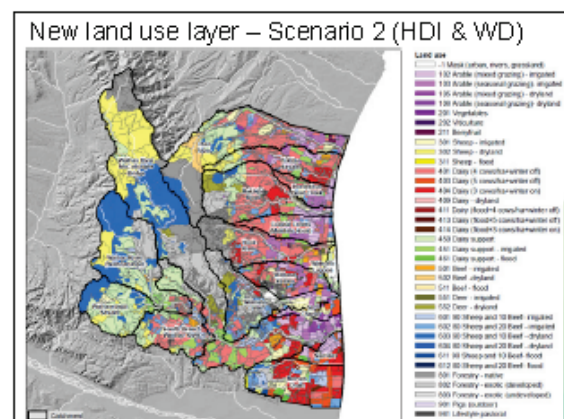
**UPDATED N LOAD ESTIMATES**



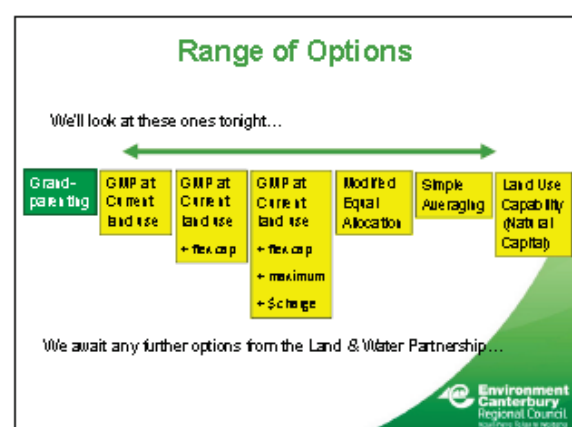
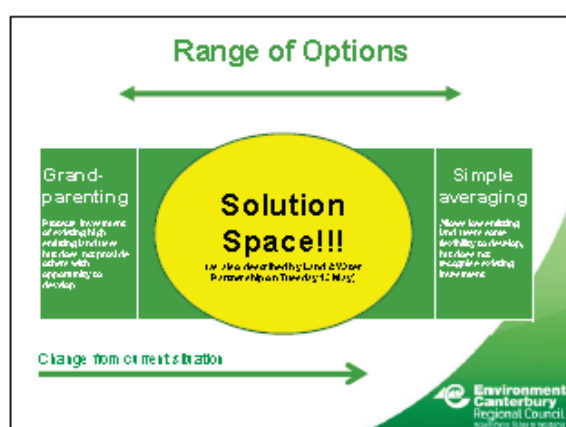
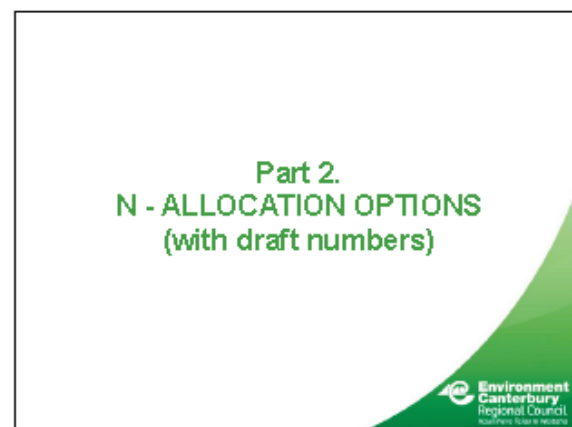
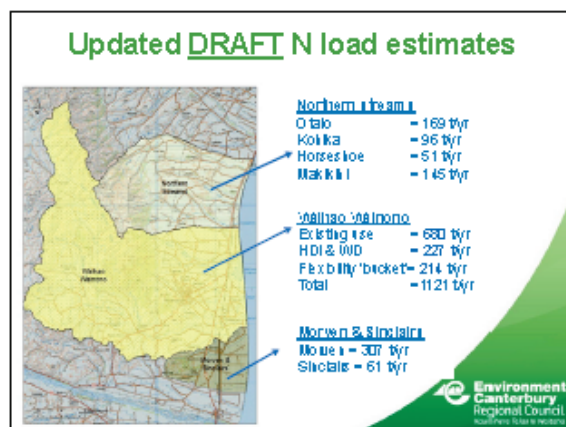
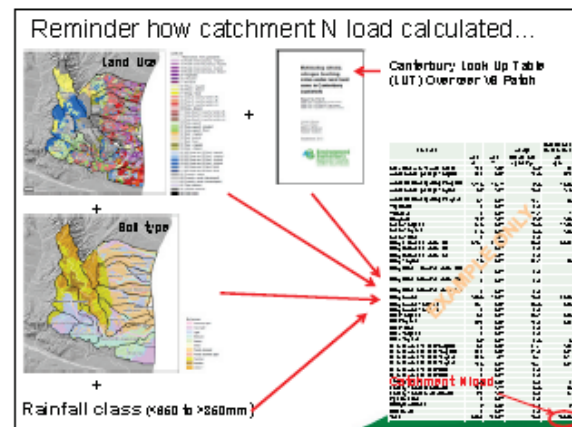
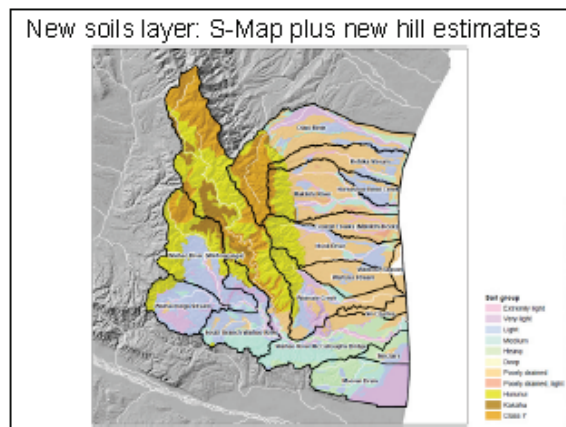
**Updated N load estimates**

Progress since February 2013...

- ✓ Now full SCCS area – added hill country
- ✓ Errors raised by NARG now fixed:
  - The 70/10/10 (pows) in all catchments
  - Incorrect border-dyke north of Waihao fixed
  - Improved estimate of dryland dairy support
  - Improved DoC estate & forestry mapping





### Grandparenting

- Default position under current LWRP
- Must stay within 2009-2013 (baseline) N loss
- Consented schemes (HDI & WD) can increase up to their limit (but at GMP)



### GMP at Current Land Use

- This makes use of the MGM project numbers when they become available
- Everyone must achieve GMP for the landuse they were doing during 2009-13 baseline
- Consented schemes (HDI & WD) can increase up to their limit (but at GMP)



### GMP at Current LU + flexibility cap + maximum

- Option allows for any changes at GMP below flexibility cap.
- Users above must mitigate – equalised so EBIT cost same across industries
- Maximum leaching rate
- Flexibility load



### Allocatable Loads to work with for providing flexibility

- Wainono:
  - Intensification 68t
  - Dryland dairy support: 146t
- Outside Wainono:
  - Intensification 54t
  - Dryland dairy support: 27t



### Impact Wainono Lagoon catchment

Flexibility level (kg/ha)	Mitigation required to achieve load limit				EBIT cost of mitigation (%EBIT)
	Arable	Sleep and Beef (low dryland, high irrigated)	Dairy (low leachy soil, high light soil)	Dairy support (low dryland, high irrigated)	
15	0%	0%	0%	0%	0%
16	2%	<1%	12%	4%	2%
17	5%	1%	23%	15%	5%
18	6%	2%	29%	20%	7%
19	MFM	5%	> MFM	> MFM	> 10%



### Impact outside Wainono Lagoon catchment

Flexibility level (kg/ha)	Mitigation required to achieve load limit				EBIT cost of mitigation (%EBIT)
	Arable	Sleep and Beef (low dryland, high irrigated)	Dairy (low leachy soil, high light soil)	Dairy support (low dryland, high irrigated)	
14	0%	0%	0%	0%	0%
15-16	2%	<1%	12%	4%	2%
18	5%	1%	23%	15%	5%
19	6%	2%	29%	20%	7%
20	MFM	5%	> MFM	> MFM	> 10%



## Process and outcomes of the Nitrogen Allocation Reference Group (NARG) for the South Canterbury Coastal Streams area

Scenario	Spurs Allocation	Million kg N/ha/yr							
		0	10	20	30	40	50	60	70
Scenario 1: no cap	Spurs Allocation	11	26	23	22	21	20	19	18
Scenario 2: no cap	Spurs Allocation	11	26	23	22	21	20	19	18
Scenario 3: no cap	Spurs Allocation	11	26	23	22	21	20	19	18
Scenario 4: no cap	Spurs Allocation	11	26	23	22	21	20	19	18
Scenario 5: no cap	Spurs Allocation	11	26	23	22	21	20	19	18
Scenario 6: no cap	Spurs Allocation	11	26	23	22	21	20	19	18
Scenario 7: no cap	Spurs Allocation	11	26	23	22	21	20	19	18
Scenario 8: no cap	Spurs Allocation	11	26	23	22	21	20	19	18
Scenario 9: no cap	Spurs Allocation	11	26	23	22	21	20	19	18
Scenario 10: no cap	Spurs Allocation	11	26	23	22	21	20	19	18
Scenario 11: no cap	Spurs Allocation	11	26	23	22	21	20	19	18
Scenario 12: no cap	Spurs Allocation	11	26	23	22	21	20	19	18
Scenario 13: no cap	Spurs Allocation	11	26	23	22	21	20	19	18
Scenario 14: no cap	Spurs Allocation	11	26	23	22	21	20	19	18
Scenario 15: no cap	Spurs Allocation	11	26	23	22	21	20	19	18
Scenario 16: no cap	Spurs Allocation	11	26	23	22	21	20	19	18
Scenario 17: no cap	Spurs Allocation	11	26	23	22	21	20	19	18
Scenario 18: no cap	Spurs Allocation	11	26	23	22	21	20	19	18
Scenario 19: no cap	Spurs Allocation	11	26	23	22	21	20	19	18
Scenario 20: no cap	Spurs Allocation	11	26	23	22	21	20	19	18
Scenario 21: no cap	Spurs Allocation	11	26	23	22	21	20	19	18
Scenario 22: no cap	Spurs Allocation	11	26	23	22	21	20	19	18
Scenario 23: no cap	Spurs Allocation	11	26	23	22	21	20	19	18
Scenario 24: no cap	Spurs Allocation	11	26	23	22	21	20	19	18
Scenario 25: no cap	Spurs Allocation	11	26	23	22	21	20	19	18
Scenario 26: no cap	Spurs Allocation	11	26	23	22	21	20	19	18
Scenario 27: no cap	Spurs Allocation	11	26	23	22	21	20	19	18
Scenario 28: no cap	Spurs Allocation	11	26	23	22	21	20	19	18
Scenario 29: no cap	Spurs Allocation	11	26	23	22	21	20	19	18
Scenario 30: no cap	Spurs Allocation	11	26	23	22	21	20	19	18
Scenario 31: no cap	Spurs Allocation	11	26	23	22	21	20	19	18
Scenario 32: no cap	Spurs Allocation	11	26	23	22	21	20	19	18
Scenario 33: no cap	Spurs Allocation	11	26	23	22	21	20	19	18
Scenario 34: no cap	Spurs Allocation	11	26	23	22	21	20	19	18
Scenario 35: no cap	Spurs Allocation	11	26	23	22	21	20	19	18
Scenario 36: no cap	Spurs Allocation	11	26	23	22	21	20	19	18
Scenario 37: no cap	Spurs Allocation	11	26	23	22	21	20	19	18
Scenario 38: no cap	Spurs Allocation	11	26	23	22	21	20	19	18
Scenario 39: no cap	Spurs Allocation	11	26	23	22	21	20	19	18
Scenario 40: no cap	Spurs Allocation	11	26	23	22	21	20	19	18
Scenario 41: no cap	Spurs Allocation	11	26	23	22	21	20	19	18
Scenario 42: no cap	Spurs Allocation	11	26	23	22	21	20	19	18
Scenario 43: no cap	Spurs Allocation	11	26	23	22	21	20	19	18
Scenario 44: no cap	Spurs Allocation	11	26	23	22	21	20	19	18
Scenario 45: no cap	Spurs Allocation	11	26	23	22	21	20	19	18
Scenario 46: no cap	Spurs Allocation	11	26	23	22	21	20	19	18
Scenario 47: no cap	Spurs Allocation	11	26	23	22	21	20	19	18
Scenario 48: no cap	Spurs Allocation	11	26	23	22	21	20	19	18
Scenario 49: no cap	Spurs Allocation	11	26	23	22	21	20	19	18
Scenario 50: no cap	Spurs Allocation	11	26	23	22	21	20	19	18

### GMP plus flexibility threshold

- Dominated by available flexibility load
- Mitigation adds some additional flexibility but only at margins
- Increasing marginal cost of mitigation
- Maximum cap has little impact on flexibility load

### GMP at Current LU + flexibility cap + maximum cap + mitigation threshold + charge

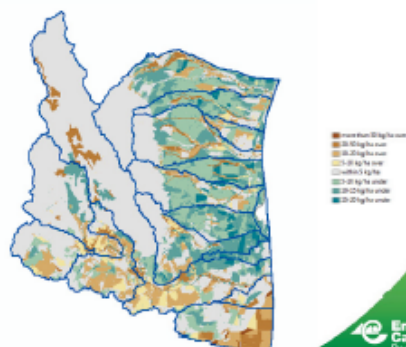
- As before but also:
  - Mitigation threshold - set threshold (e.g. 30 kg/ha/yr)... then...require scaled mitigation (e.g. x% reduction) for those above the threshold; and/or...
  - Impose a charge (\$/kg/ha) above and/or below the threshold that goes into a fund to support other environmental aspects of the "Solution Package"

### Modified Equal Allocation

- Note numbers here apply to whole SCCS area - not for each catchment

	Total Load (t/yr)	Mean (kg/ha)
Allocable load	1739	20.0
Step 1: Initial - Cap Load	122	4.3
NPL (e.g. Dec 2024)	4	0.4

### Modified Equal Allocation



### Modified Equal Allocation

- Beneficial for those below cap
- Restrictive on light soils with high leaching
- Significant mitigation and land use change likely to be required for high leaching land uses
- Need trading to be workable – transfer between landholders
- Efficiency depends on ability to trade
- Disruptive from an economic point of view

### Proportion of land use beyond MFM under Modified Equal Allocation (outside Wainono)

Available	Sheep, beef, deer irrigated	Sheep, beef, deer dryland	Dairy	Dairy support (dry)	Dairy support (irrig)
18%	25%	3%	40%	12%	41%

### Land Use Capability (Natural Capital)

- Note numbers here apply to whole SCCS area - not for each catchment

LUC	NDA
1	22.9
2	22.4
3	20.2
4	15.1
5	15.1
6	12.0
7	3.25
8	0

### Land Use Capability (Natural Capital)

- Significant cost for some land uses with land use change likely
- Unworkable for some
- Will encourage leaching onto heavy soils - economically efficient for one constraint but not necessarily for others.
- Unused allocation – inefficient
- Trading may alleviate – transfers of wealth between landholders
- Disruptive from an economic point of view

### Part 3. DISCUSSION...

### Group discussion

- In the NARG group and 2 or 3 other groups:
- Start to identify what approach you believe should be used in South Coastal Streams to manage to the N load limit.
- You may wish to consider:
  - What, how and when GMP is expected;
  - Expectations of irrigation schemes;
  - How, if at all, will you allow for land use intensification (beyond new irrigation schemes);
  - Expectations of properties with high N losses;
  - How long for the transition from current to your desired allocation . . . .
- Feedback key points to meeting after about 30 minutes.

END


## Meeting 6 – N Allocation Options (short-list of 3)

**Nitrogen Allocation Reference Group (NARG)**

**Meeting 6: N Allocation Options**

Ned Norbin, Simon Harris, Melissa Robison

4 June 2014  
Waimata Community Centre




**Purpose of this meeting**

**N-Allocation – short list of 3 options (as requested by NARG)**

1. "GMP based on land use + flex cap"
2. "Modified equal allocation"
3. "GMP based on soil and climate"


**Group Discussion – pros and cons**




**First up – IMPORTANT – DRAFT !!!**

*"To work with ECan to assess and describe the consequences of different options for allocating N load in the South Canterbury Coastal Streams (SCCS) area"*


We are working hard to get numbers for your conversation on your options – they are **DRAFT** – we reserve the right to find errors and make corrections – help work with us!!!




**Reminder - DRAFT N load estimates**




Northern streams	
Otago	= 169 t/yr
Kotika	= 96 t/yr
Horseshoe	= 51 t/yr
Makikihi	= 145 t/yr
Waikaiti/Maitahi	
Existing use	= 680 t/yr
HDI & IWD	= 227 t/yr
Flexibility 'bucket'	= 214 t/yr
<b>Total</b>	<b>= 1121 t/yr</b>
Mowhena/Sinclair	
Mowhena	= 307 t/yr
Sinclair	= 61 t/yr




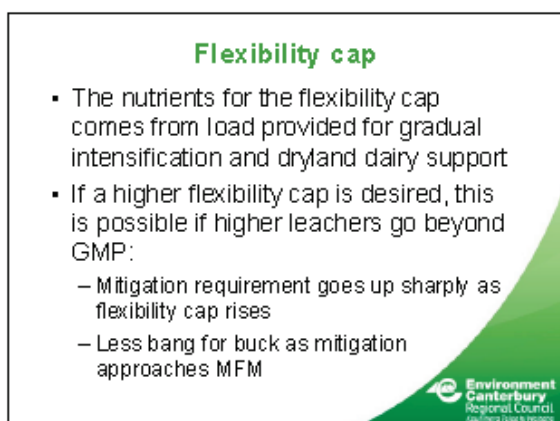
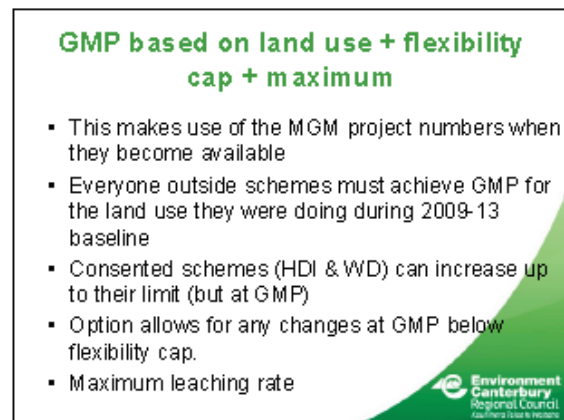
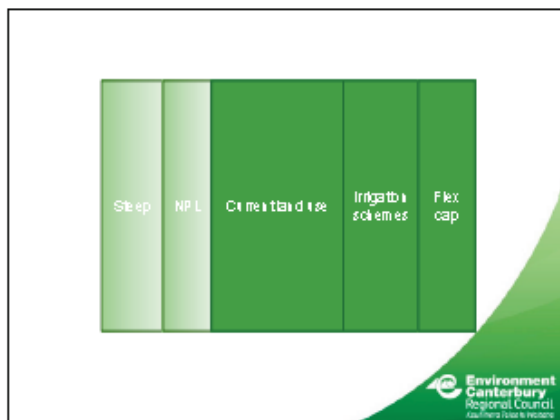
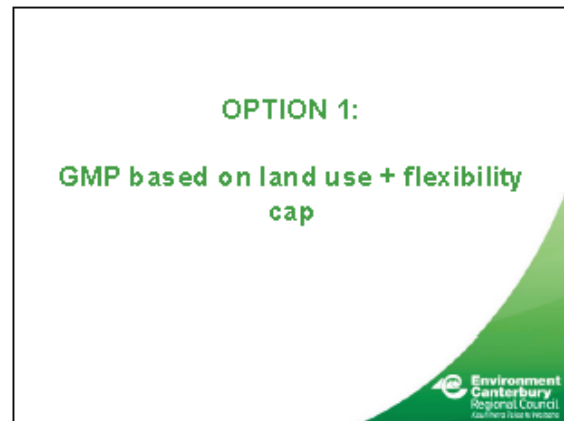
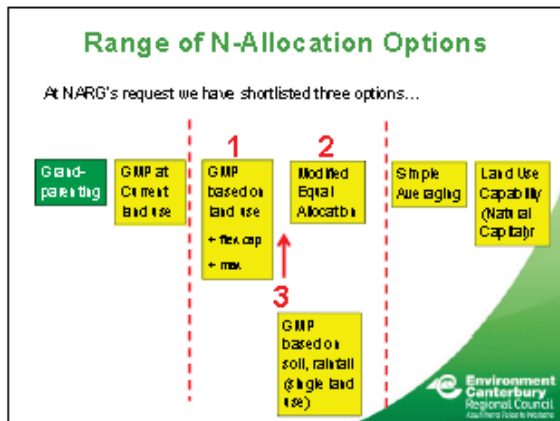


**Range of N-Allocation Options**



Change from current situation





### Impact of different flexibility caps on Wainono Lagoon catchment

Flexibility level (kg/ha)	Mitigation required to achieve load limit				EBIT cost of mitigation (%EBIT)
	Arable	Sheep and Beef (low dryland, high irrigated)	Dairy (low leachy soil, high light soil)	Dairy support (low dryland, high irrigated)	
15	0%	0%	0%	0%	0%
16	2%	<1%	12%	4%	2%
17	5%	1%	23%	15%	5%
17 - 18	6%	2%	29%	20%	7%
18	MFM	5%	>MFM	>MFM	>10%

### Implications

- Least disruptive of 3 methods, including economically, as it starts from current land use
- Does not require trading and transfer to operate the system
- Will require trading and transfer to optimise the system (i.e. could develop over time)
- Provides for specific development within irrigation schemes
- Gives low leaching operations outside schemes a degree of flexibility
- Constrains high leaching operations to GMP, but still gives higher allocations (i.e. have more flexibility)

### Potential fish hooks

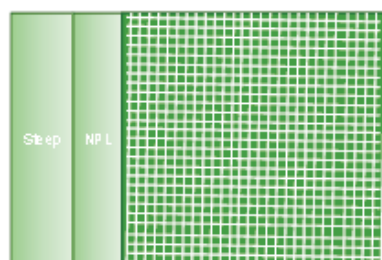
- Defining baseline land use (potential for gaming)
- MGM v1 will change loads
- Periodic updating of MGM/OVERSEER
  - how this will be taken into account?
  - Flexibility threshold may change with versions

### OPTION 2:

### Modified Equal Allocation

### Modified Equal Allocation

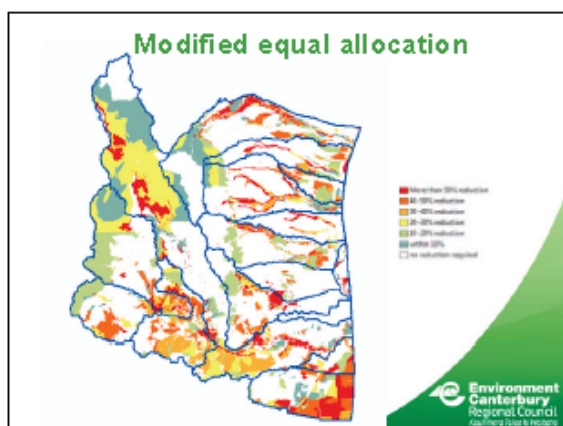
- Catchment divided according to level of productivity
- Each zone has an average
- Everyone in zone receives average load



### Modified Equal Allocation

	Mean (kg/ha) whole SCCS	Mean (kg/ha) non Stream 1	Mean (kg/ha) Mahitao-Mahinono	Mean (kg/ha) Morven Sinclair
Allocatable area	20.0	17.9	19.4	28.9
Steep (Hunui + Class 7 total)	4.3	4.2	4.3	-
NPL (eg DOC sites)	0.4	0.4	0.4	6.2





### Leaching & ability to meet equal NDA

Parameter	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100
Parameter 1	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100

### Proportion of land use beyond MFM under Modified Equal Allocation (inside Wainono)

Available	Sheep, beef, deer irrigated	Sheep, beef, deer dryland	Dairy	Dairy support (dry)	Dairy support (irrig)
13%	19%	3%	4%	46%	65%

- ### Implications
- Initially most disruptive of 3 methods, including economically
  - Will require trading and transfer to operate the system (and optimise)
  - Does not provide for specific development within irrigation schemes
  - Gives low leaching operations flexibility to intensify up to NDA
  - Restrictive for high leaching operations requiring mitigation or land use change or trading to continue operating
  - Likely to be unused allocation

- ### Potential fish hooks
- Need trading or transfer mechanism immediately
  - Updates to OVERSEER and or MGM

### OPTION 3:

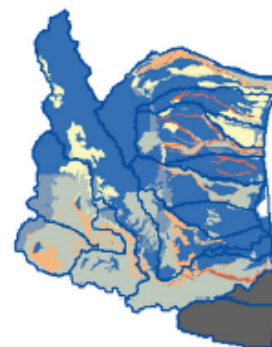
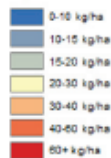
### GMP based on soil and climate (single land use)



### Option 3

- Define a land use such that if everyone did it, the catchment load would not be breached.
- Everyone receives the load that they would lose if they did that land use on their soil type/climate.
- Increasing allocation with soil N loss vulnerability
- For Wainono land use would be ~ Dairy 3 cows/ha wintered on

Option 3 allocation

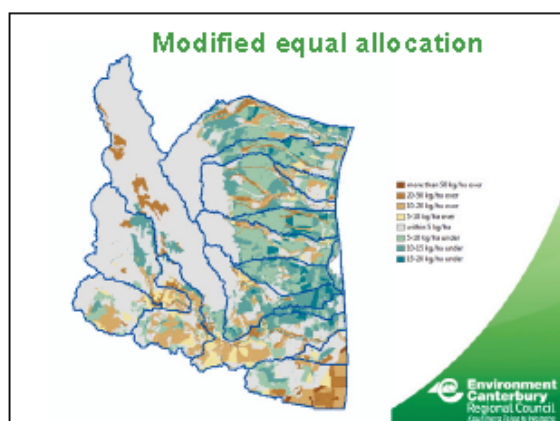
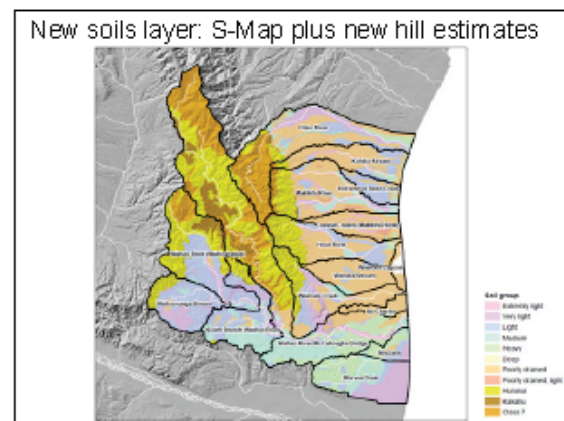
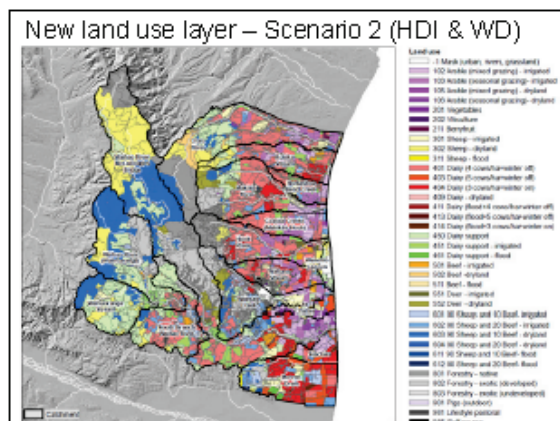
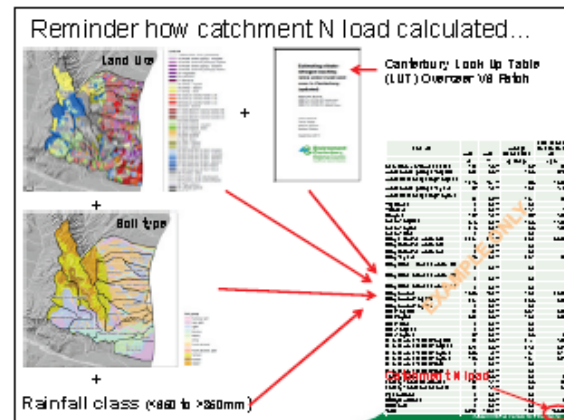


### Implications

- Initially middle level of disruption of 3 methods, including economically
- Probably will require trading and transfer to operate the system (and optimise)
- Probably will require trading and transfer to optimise the system
- Does not provide for specific development within irrigation schemes
- Gives v low leaching soils/climates have little flexibility
- Restrictive for some high leaching soils/climates requiring mitigation or trading to continue operating (less than MEA)

Subcatchment	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100
Subcatchment 1	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100
Subcatchment 2	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100
Subcatchment 3	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100
Subcatchment 4	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100
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Subcatchment 6	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100
Subcatchment 7	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100
Subcatchment 8	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100
Subcatchment 9	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100
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Subcatchment 14	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100
Subcatchment 15	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100
Subcatchment 16	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100
Subcatchment 17	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53																																															

# Process and outcomes of the Nitrogen Allocation Reference Group (NARG) for the South Canterbury Coastal Streams area




## Meeting 8 – Closer Inspection of Option 1 - Maximum caps and flexibility caps

**Nitrogen Allocation Reference Group (NARG)**

**Meeting 8:  
Closer inspection of Option 1 –  
Maximum caps and flexibility caps**

Ned Norton, Simon Hamill

25 June 2014  
Valmaitia Community Centre



**Purpose of this meeting**


- 1. Closer inspection of Option 1 – variations?**
  - Maximum Cap – options?
  - Flexibility Cap – options?
- 2. Group Discussion – consensus?**

**DRAFT NUMBERS !!!**




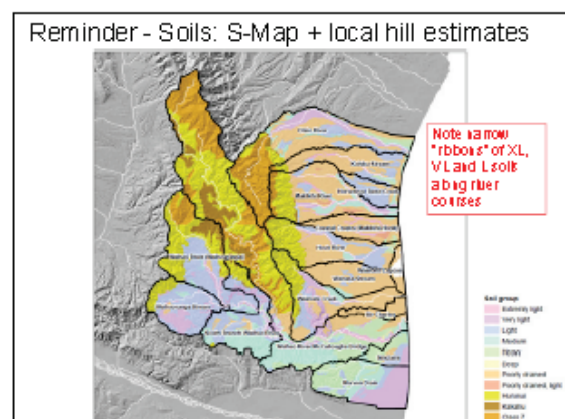
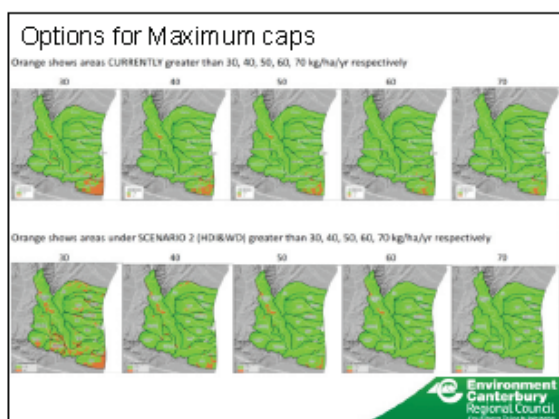
**Reminder: Option 1 - GMP at Current Land Use**

- This makes use of the MGM project numbers when they become available
- Everyone must achieve GMP for the landuse they were doing during 2009-13 baseline
- Consented schemes (HDI & WDI) can increase up to their limit (but at GMP)
- Flexibility cap for low leachers (to date 15 kg/ha/yr)
- Maximum cap? – constrains high leachers**
- Flexibility cap? – provides flexibility to low leachers**

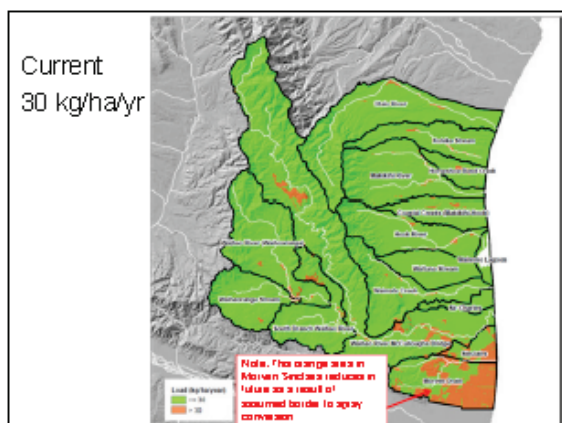
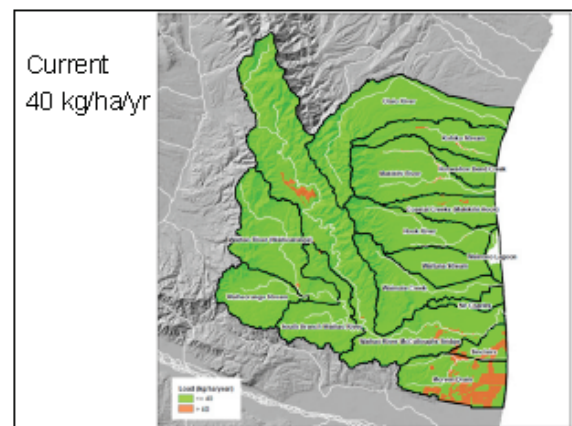
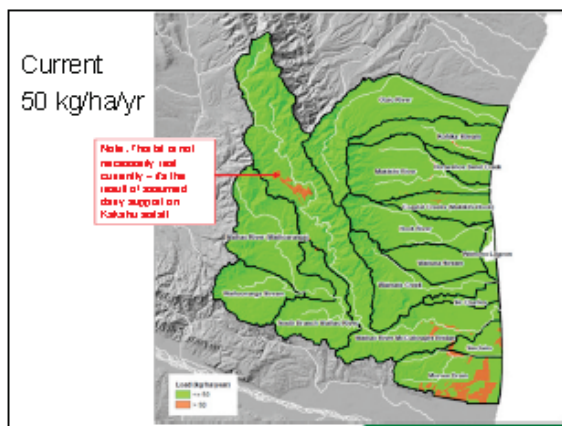
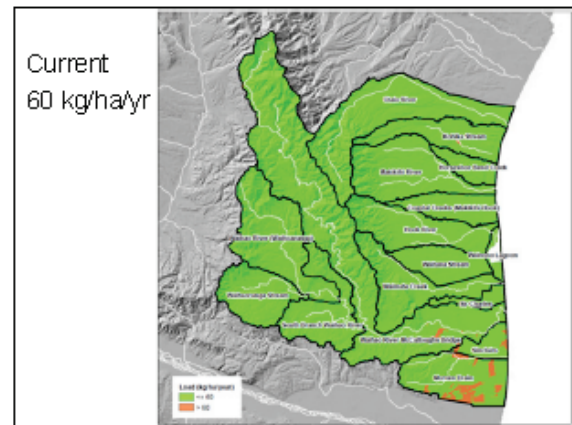
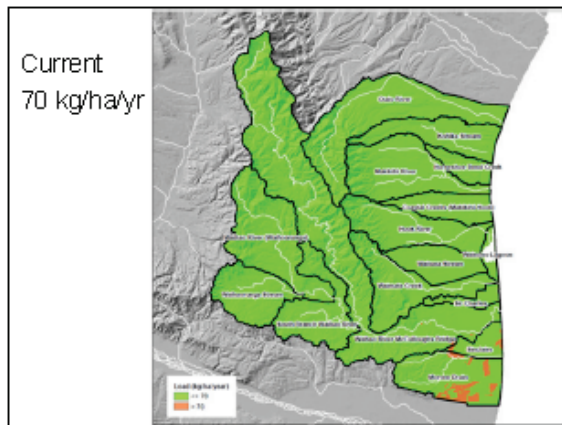


**1. MAXIMUM CAP – OPTIONS?**





**Process and outcomes of the Nitrogen Allocation Reference Group (NARG) for the South Canterbury Coastal Streams area**



**Max cap for Waihao Wainono & Nth streams**

- Constrains high leaching land uses on light soils (tend to be beside rivers)
- Reduce risk of local "hot-spot" effects on rivers
- Could use some load "saved" to add to flexibility cap

**Max cap for Morven Sinclairs**

- Environmental risks are not the same (less)
- Warrants considering a different (higher) max cap
- Some gains are coming with moves to more efficient irrigation (border to spray)



***Process and outcomes of the Nitrogen Allocation Reference Group (NARG) for the South Canterbury Coastal Streams area***

Table 1. Waihao- Wainono Max Cap Options

Cap (lg M)	Load sized (lg M)	Are greater than or equal to cap	Proportion of load at or below cap	Proportion of a new set at or below cap
20	137790	128003	48%	76%
25	97904	122403	55%	79%
30	84442	106382	62%	84%
35	22326	78742	88%	97%
40	2391	14462	95%	98%
60	4366	3833	95%	99.6%
70	3081	2420	100%	100%

Note. Numbers based on Scores  $\pm 2$  SD (minus Reliability bucketed, NPL, along with 10)

**Suggestion from some NARG members – max cap at 40 kg & mitigate above 30 kg?**

A m3 : cap at 40 affects 3% of the area and trim : top 11% of load

## Implications?

Red = 40 & greater; Orange = 30-39; Green = less than 30

use or take	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100
use or take	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100
use or take	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100
use or take	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100
use or take	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100
use or take	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100
use or take	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100
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use or take	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100
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use or take	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100
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### How much mitigation for those over 30 kg?

Table 2. Implications of different mitigation requirements (when flex threshold is at 15 kg/ha/yr)

		Inflorogen required:					
CBT Case (%CBT)	Inflorogen load (mmol)	Probia	Sheep, beet, deer Inflorogen	Sheep, beet, deer Inflorogen	Deinv	Deinv support	Deinv support limit
2%	25	2%	0%	0%	12%	4%	4%
4%	40	2%	5%	1%	16%	4%	4%
6%	60	4%	5%	1%	21%	11%	11%
8%	80	5%	5%	1%	22%	15%	15%
10%	90	6%	2%	2%	23%	20%	20%
20%	110	6%	4%	4%	26%	26%	26%
100%	115	9%	5%	5%	30%	26%	40%

Approx.  
midpoint  
between  
GMP &  
MFM

Eg. Dairy reduce from 40 to 25 kg/ha

Eg. Dairy reduces from 40 to 24 kg/ha

Eg. Daisy reduces from 40 to 21 kg/ha

## 2. FLEXIBILITY CAP – OPTIONS?

Shown to NARG previously – flex cap options

(This assumes everyone above the flex cap mitigates in order to "save" load to make available for those below the flex cap)

Flexibility level (kg/ha)	Mitigation required to achieve load limit				EBIT contribution mitigation (%EBIT)
	Arable	Sheep and Beef (low dryland, high irrigated)	Dairy (low heavy soil, high light soil)	Dairy support (low dryland, high irrigated)	
15	0%	0%	0%	0%	0%
16	2%	<1%	12%	4%	2%
17	5%	1%	23%	15%	5%
17 - 18	6%	2%	29%	20%	7%
18	MFM	5%	>MFM	>MFM	>10%

Only GMP required for  
every one to get a  
flexibility cap of 15k gms

What if Max cap at 40kg & mitigate above 30 kg?

Should these gains go solely to reducing risk for the environment? – or should some be available to add to the flexibility cap for low leachers?

- Max cap 40 & mitigate @ 2% EBIT; load gain  $\approx 50$  t/yr
  - Max cap 40 & mitigate @ 4% EBIT; load gain  $\approx 65$  t/yr
- Note there is considerable uncertainty about these gain calcs

These gains are sufficient to lift flex cap from 15 to 16 kg/ha/yr (but not enough to go to 17 kg/ha/yr)

**GROUP DISCUSSION???**

**Opportunity to reach consensus?**




**What do you think about...**

For Waihao-Wainono and Northern Streams


1. A maximum cap at 40 kg/ha?
2. Requiring mitigation over 30 kg/ha?
3. If so – how much mitigation? – Row 1, 2 or 3 of Table 2
4. How much time to ease in max cap and mitigation?
5. Should some gains go to lift flex cap from 15 to 16 kg/ha?

For Morven Sindaers

1. A higher maximum cap? – 50? 60?
2. Require mitigation? – benefits coming from border/spray
3. Flexibility cap not really relevant in this catchment?



**END**




## Meeting 9 – Seeking Consensus

**Nitrogen Allocation Reference Group (NARG)**

**Meeting 9:  
Seeking consensus**


Ned Norbin, Nic Newman, Ian (Whit) Whitehouse  
2 July 2014  
Waimate Community Centre



**NARG's task**

**To reach consensus on an N-allocation framework for the 3 SCCS areas:**

- Waihao-Wainono
- Northern Streams
- Morven Sinclairs



**At last NARG meeting – 25 June 2014 – consensus reached on...**

**Start with Option 1 plus 'tweaks'.**


- The 'tweaks' are the details around:
  - maximum caps / mitigation beyond GMP for high emitters
  - flexibility caps - availability for low emitters



**Maximum caps/mitigation for Waihao-Wainono and Northern Streams**

*Proposed framework from small group discussion on Monday 30 June 2014...*


Max cap	Soils	New Users (HDI + WND + any other new)	Existing Users	
35 (30? 5 yr?)	XL, VL, L	Achieve immediately on conversion	Must prepare plan by 2020 showing how to achieve	Achieve by 2025
25	M, H			
20	Rd, Rd, D			



**Flexibility caps**

Remember, from technical perspective, enabling flexibility above current (2009-13) land-use relies on...


- HDI & WD proceeding (requires extra D-support) – **when?**
- Augmentation implemented and working - **when?**
- Max caps/mitigations by high emitters - **2025?**
- Claw-backs needed later if these are not successful!!!



**Flexibility caps – continued...**

Recommendations are required from NARG to Zone Committee on flexibility cap...

- What size?
- Available from when?
- How do people access it? (see below)
- Flexibility cap increase after a certain date? – versus holding the "gains" from max cap/mitigations in a "pot" that can be applied for by consent later IF environmental outcomes are being achieved



## MORVEN-SINCLAIRS CATCHMENTS

Recommendations are required on ...

- What size maximum cap?...and when?
- Flexibility cap - same as for Waihao-Wainono?

## NEXT STEPS?

Last NARG meeting next week 9 July 2014



## **Appendix 5: NARG allocation principles – developed at Meeting 3: 30 April 2014**

Once the load limit has been set for achieving cultural, social, economic and environmental outcomes the following principles will guide the community to the most appropriate method of allocating nutrients.

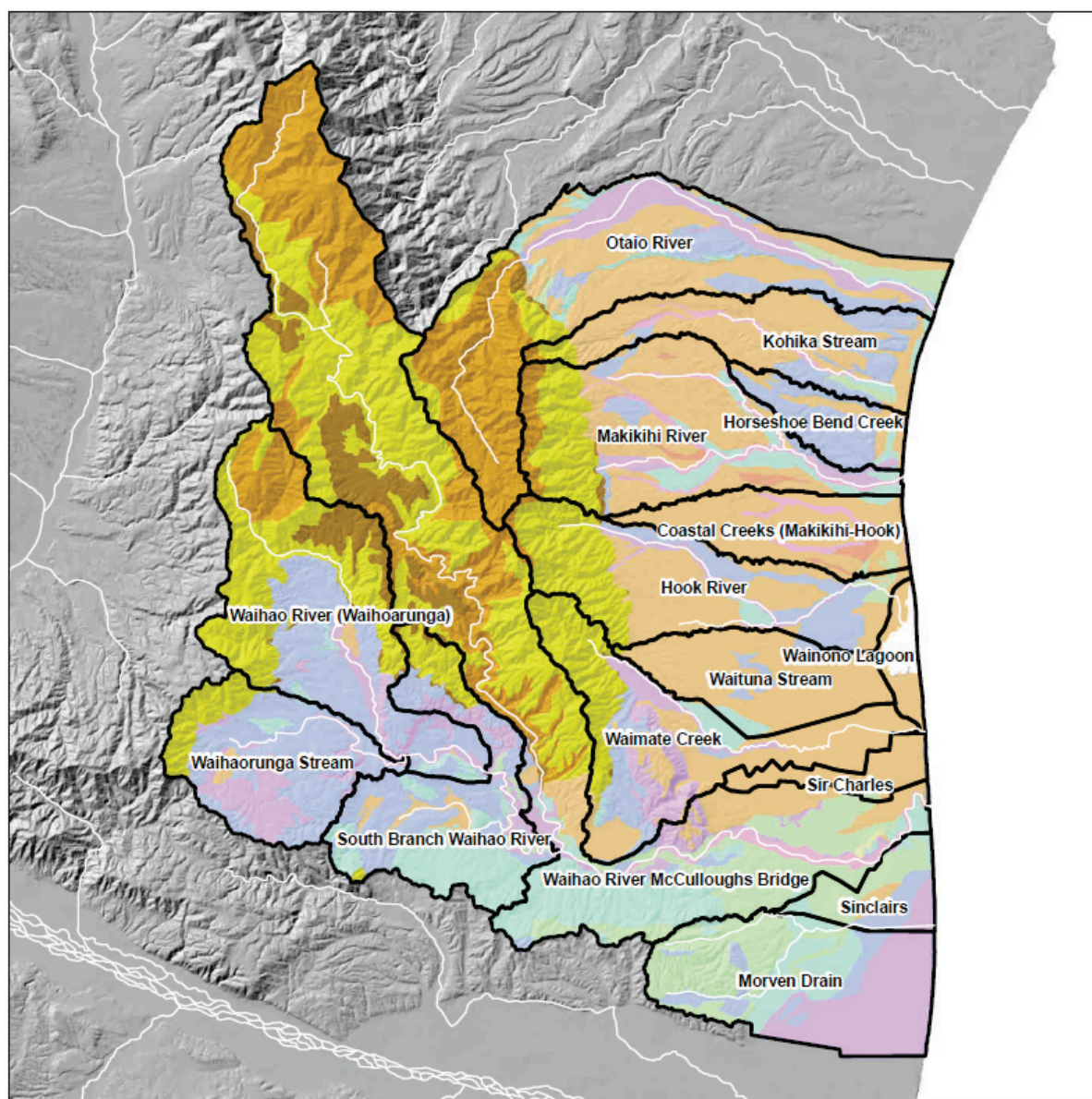
### **Agreed N allocation principles for SCCS**

1. Community businesses need to be economically viable
2. Celebrate and Incentivise lower emissions
3. If there is a reallocation of nutrients, this occurs over time
4. Recognise existing investment that businesses have made
5. Allow for flexibility of land use
6. Not bias one particular sector or interest group
7. Use the best available science at the time
8. Allow for adaptation and innovation to occur
9. The degree of regulatory control should be consistent with the degree of environmental pressure

The Land and Water Partnership subsequently released (November 2014) a draft list of guiding principles including:

1. The process for managing nutrients needs to be based on good quality science, treat all land users fairly and protect the maximum possible flexibility of land use.
2. The primary focus of regulatory authorities should be on incentivising and supporting on-farm action and behaviour change to achieve desired outcomes.
3. The process for managing water quality must be flexible enough to adapt in response to new information.
4. Timeframes for achieving targets and objectives must be realistic, and frequently reviewed and adjusted to reflect observed improvements in water quality and new information.
5. All parties affected by (regulators of and those regulated by) the process for managing nutrients need to be held accountable.
6. All contributors to the problem should contribute to the solution in accordance with their impact. The approach to managing contaminants (including nutrients) should be informed by the 'polluter pays' principle.
7. The degree of regulatory control – including rules and conditions, monitoring, auditing and reporting – needs to relate to the degree of environmental impact and pressure.
8. As a minimum expectation, all land users should be at or moving towards industry defined Good Management Practice (GMP), recognising that GMP is an evolving standard and that continuous improvement is inherent in GMP
9. Long term investment certainty is a critical feature of a viable nutrient management system.
10. In under-allocated catchments the system for managing nutrients must be signalled well before the limit is reached, clear and easy to understand, and designed to avoid over-allocation.

## Appendix 6: Soil map used for NARG



- Soil group**
- Extremely light
  - Very light
  - Light
  - Medium
  - Heavy
  - Deep
  - Poorly drained
  - Poorly drained, light
  - Hurunui
  - Kakahu
  - Class 7



## Appendix 7: Media and articles after NARG agreement

Otago Daily Times 18 July 2014

# Farmers' consensus applauded

A new way of working out water-quality responsibilities has been achieved by local farmers. SALLY BROOKER reports.



Cheers... Toasting the success of their water-quality negotiations with a glass of water are (from left) Lower Waitaki-South Coastal Canterbury Zone Committee chairman Robin Murphy, Environment Canterbury technical lead Ned Norton, Waihao Runanga representative Pauline Reid, Environment Canterbury commissioner Tom Lambie and Nitrogen Allocation Reference Group leader Colin Hurst. PHOTO: SALLY BROOKER

CO-OPERATION between farmers with competing interests has been hailed in Waimate.

After holding numerous meetings since February, many of them heated, landowners in the Lower Waitaki-South Coastal Canterbury catchment have agreed on how much nitrogen can be allowed to come off their land.

On Wednesday, they convinced a major Environment Canterbury water committee that their consensus was the way forward. The process they developed, working literally from the ground up, would become a template for other water-quality decisions.

Farmers were concerned about incoming rules dictating how much nitrogen could be released into waterways from their properties. When ECan was about to impose limits, farmers on the northern side of the Waitaki River asked it to "put the brakes on". Makikihi arable farmer and North Otago-South Canterbury Federated Farmers grain and seed chairman Colin Hurst said.

He went on to lead the Nitrogen Allocation Reference Group, which became known as Narg. Its meetings were open to anyone in the catchment, with the aim of working out how to meet nitrogen thresholds.

It was a complex equation,

factoring in soil types, land contours, current land uses, incoming irrigation schemes and potential for development.

The maximum amount of nitrogen acceptable in the catchment had been decided by ECan. The farmers had to decide how the load limit would be divided among them. ECan supplied staff to give technical advice.

"It hasn't been an easy process," Mr Hurst said.

"Everyone had to give a bit." A solution seemed out of reach, but in the end everyone agreed.

"I'm really rapt where we got to."

Based on soil types, farms in the Waihao Wainono area would be allowed to release up to 10kg of nitrogen per hectare per year, while those in the Northern Streams area could release 15kg.

When the Wainono Lagoon was augmented by increased water flows, either through the proposed Hunter Downs irrigation scheme or by other means, the Waihao Wainono limit would increase to 15kg.

"Good management practice" was to be used by all farmers. They could form collectives to average the nitrogen loads between their properties within subcatchments, provided none exceeded the maximum.

Continued Page 17

## Farmers' water-quality consensus applauded

From Page 20

The consensus would be presented to the ECan commissioners on July 24. If they approved, it would be signed off on August 7.

Lower Waitaki-South Coastal Canterbury Zone Committee chairman Robin Murphy said on Wednesday it was "quite a momentous occasion".

ECan commissioner and committee member Tom Lambie said the agreement was formed through the power of goodwill. ECan was "devolving responsibility down to the community level" and the same model would be used elsewhere.

Having the agreement inspected by independent hearing commissioners provided the necessary checks and balances, he said.

Mr Hurst was delighted ECan had been able to trust the farmers, who "don't want to get it wrong". He said ECan technical lead Ned Norton, who travelled from Christchurch to attend Narg meetings, was "an incredible individual".

Federated Farmers national president William Rolleston said the agreement gave everyone opportunities. The activities of high nitrogen emitters were not undermined, nor were the land values of low emitters.



Courier Country 23 July 2014

# Water deal celebrated

A new way of working out water-quality responsibilities has been achieved by local farmers. SALLY BROOKER reports.

Compromise and co-operation are being hailed as the main ingredients in a South Canterbury agreement on nitrogen limits.

Farmers in the Lower Waitaki-South Coastal Canterbury catchment had asked their Environment Canterbury zone committee for more time to work on allocating nitrogen emissions, within the maximum already set to meet the goals of a healthy environment and vibrant economy.

Since February, the farmers have held more than 10 meetings, with ECan supplying technical advisers. After fearing they would not agree, they eventually did.

"It hasn't been an easy process," Makikihi arable farmer and South Canterbury-North Otago Federated Farmers grain and seed chairman Colin Hurst said.

"Everyone had to give a bit. We've got a really good consensus."

Mr Hurst, who led the farmer meetings, said "the spotlight

was on us nationwide — it was a new way of doing it". Based on soil types,

farmers in the Waihao Wainono area would be allowed to emit up to 10kg of nitrogen per hectare a year. In

the Northern Streams area, they could emit up to 15kg. When the Wainono Lagoon was augmented with extra water from the proposed

Hunter Downs irrigation scheme, or through some other source, the Waihao Wainono farmers would be allowed to increase their nitrogen emissions up to 15kg.

All farmers had to adopt "good management practice". They would be able to set up formalised collectives to average emissions across their properties within subcatchments, provided none exceeded the maximum.

"We're drawing a line in the sand, saying high-emitting activities on light soil is not on," Mr Hurst said.

Last Wednesday, the agreement was presented to the zone committee's meeting in Waimate. Applause erupted from the public gallery when it was accepted unanimously.

The agreement will be presented to ECan tomorrow and, if approved, signed off by its commissioners on August 7.

It will then be presented to the Waimate District Council on September 16, the Waitaki District Council the following day, and to the wider public at a date yet to be set, probably in late September.

Continued Page 3



**Cheers . . .** Toasting the success of their water quality agreement with glasses of water are (from left) Lower Waitaki-South Coastal Canterbury Zone Committee chairman Robin Murphy, Environment Canterbury technical lead Ned Norton, Waihao Rununga representative Pauline Reid, Environment Canterbury commissioner Tom Lambie and Nitrogen Allocation Reference Group leader Colin Hurst.

PHOTO: SALLY BROOKER

## 'Consensus' water deal celebrated

From Page 1

Federated Farmers national president William Rolleston, a South Canterbury farmer who attended the Waimate meeting, said the outcome gave all farmers

opportunities. It did not undermine the activities of the high emitters or the land values of the low emitters.

"The Environment Canterbury staff and Colin have done an outstanding job," Dr Rolleston said.

Zone committee chairman and Glenavy farmer Robin Murphy said he was "really thrilled how the total community got together to work out how it's going to happen".

"These are exciting times." He urged the farmers not to "disband" but to "stay on top of it".

"If we've got something wrong, I hope we're big enough to sort it out. It's a real opportunity."

ECan commissioner and zone committee member Tom Lambie said he envisaged the process used in this case becoming a template for other parts of the district.

Timaru Herald 19 July 2014

# Farmers agree on nitrogen

**Jack Montgomerie**

jack.montgomerie@timaruherald.co.nz

Farmers in the Waihao-Wainono catchment presented a compromise deal on nitrogen caps on Wednesday night.

Waimate District councillor and member of the Lower Waitaki-South Coastal Canterbury Zone Committee, Peter McIlraith, praised arable farmer Roger Small for alerting the committee to some farmers' concerns about nitrogen leaching rules.

Small, who farms on the banks of the Waihao River, said proposed rules would have set a 10 kilogram per hectare per annum nitrogen leaching cap placed on low-emitting farms. That could have prevented the catchment's majority of sheep, beef and cropping farms from converting to dairy.

"Basically whatever you were going to do in these catchments you were going to be locked in," Small said.

As a result, a reference group was formed to allow local farmers to revise targets among themselves. Arable farmer Colin Hurst helped to lead the group and said negotiations between low and high emitters had been difficult.

"You've got a group of people sitting around a table dividing up a pot of nitrogen, which represents money," he said. Nonetheless, he was pleased with the group's final agreement. Dairy farmer Bruce Murphy said he was also happy with "a fair outcome that was robustly debated".

Water scientist and ECan South Canterbury project lead Ned Norton said a cap of 20-35kg/H/p.a. was placed on high emitters depending on soil type. Some

farms were currently leaching between 70 and 80kg/H/pa. The high emitters' cap would be met by 2025, allowing small emitters to increase their nitrogen leaching from 10 to 17kg/H/pa by 2025.



*Courier Country 6 August 2014*

## Deal 'like apartheid'

**SALLY.BROOKER**

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Not everyone is happy with the agreement on nitrogen levels celebrated on the front page of the previous Courier Country.

Waihao farmer Roger Small says the agreement is "like apartheid".

After months of meetings to decide how much nitrogen could be emitted from land in the Lower Waitaki/South Coastal Canterbury catchment to meet Environment Canterbury water quality standards, farmers came up with an equation.

Colin Hurst, who led the farmer meetings, said it was not easy to get agreement and he feared it would be impossible.

Mr Small spoke out at the meeting in Waimate where the agreement was approved by the ECan zone committee. He believes farmers producing low nitrogen emissions are disadvantaged by others producing levels well above the desired amount.

Were it not for the responsible farming methods carried out by the low emitters, the high emitters could not continue their practices while the overall catchment stayed within the limits, he said.

Mr Small preferred the Otago Regional Council method, where all landowners were responsible for the nitrogen entering waterways from their property. If they did not meet the required water quality standard by 2020, they could apply for a non-notified resource consent for five years. If they still did not meet the standard by 2025, they would have to apply for a notified consent and the council would look closely at their operations. ECan was taking current land uses into account. Dairy farmers were being allowed to emit a lot more nitrogen than others. "Otago doesn't believe past or future investment should be part of the equation," Mr Small said. Farmers in sensitive Otago areas could leach 15kg of nitrogen a hectare per year. On very light soils alongside some of the South Canterbury waterways, farmers who run five cows to the hectare would be allowed to leach 78kg a hectare. Arable farmers on the same soils would be allowed to leach only 27kg to 30kg a hectare. There were only a few high leachers, but ECan did not seem to consider that their land use was inappropriate, Mr Small said. "In Otago, the low emitters are not even around the table. "This system put the high and low emitters against each other."

ECan should have approached the high emitters first, he said.

"Even the high emitters admitted they could only do two and a half to three cows a hectare without bringing in feed."

Mr Small was emitting about 6kg of nitrogen, but wanted the opportunity to intensify his systems if his children wanted to take over the farm in the future. There was not enough leeway for them to do what others were already doing.

"If my kids want to go into vegetables, they're limited, because the dairy farmer next door has got high emissions."

The Overseer nutrient budgeting tool being used by ECan was "not up to it" for any farming type except dairying, Mr Small said. In Otago, Overseer was only being used in areas with a water quality problem, whereas all Canterbury farmers had to use it.

The "good management practice" matrix adopted by ECan would not be defined until June next year.



Not happy . . . Roger Small believes farmers like himself, producing low nitrogen emissions in the Waihao Wainono catchment, are getting a raw deal compared with some high-emitting dairy farmers. PHOTO: SALLY BROOKER



A question of quality . . . water quality, not current land uses, should govern farming practices, says Roger Small, who farms near the Waihao River. PHOTO: SALLY BROOKER

**Articles subsequently written expressing views by NARG members**

**Nitrogen Allocation South Canterbury Coastal Streams**  
*(Federated Farmers Newsletter)*

By Colin Hurst

I recently hosted a presentation for the Hurunui-Waikari zone committee on our response to the regional council's proposed nitrogen allocation for South Canterbury Coastal Streams.

Our hosts in North Canterbury made us very welcome –over 300 people attended-and there was lots of interest in what we were doing down our neck of the woods.

As many of you will be aware the council's proposals which, first surfaced back in February, have caused much confusion and concern as to how farmers could meet proposed nutrient allocations and the consequences for them and their businesses if they failed to.

In response farmers protest at the Lower Waitaki South Coastal Canterbury Zone meeting Ecan set up NARG: *Nitrogen Allocation Reference Group*, as a means towards understanding what was exactly required and to find suitable solutions moving forward.

NARG was open to the public and our pledge is "To work with Ecan to assess and describe the consequences of different options for allocating N load in the South Canterbury Coastal Streams (SCCS) area".

Our aim essentially was to find a suitable nitrogen allocation method. This requires amongst other things community involvement and commitment to meet deadlines.

There has been numerous meetings throughout the last few months involving low and high emitting land users and we've had input and support from the regional council, Federated Farmers and DairyNZ as well as technical support..

I have to say the process has been unique and ultimately successful insofar it has brought farmers together on the common goal of meeting the regional council's N allocation limits.

Environment Canterbury deserves praise too for throwing a great deal of time and resources into finding a compromise for all parties. The Ecan staff was committed in deliberations from the outset and obviously wanted results.

The outcome established an agreement that the high emitting farmers have little room to manoeuvre and therefore are entitled to have their investment protected. With the introduction of maximum caps and are expressed as maximum losses for different soil types (e.g. 35kgN/ha/yr for very light and light soils; 20kgN/ha/yr for poorly drained soils).This would be achievable through reductions over time

Low emitting farmers, shall meanwhile have the option to intensify their operation if they decide to. This will allow low leaching land uses to change land use and increase nutrient loss up to the flexibility cap. The proposed flexibility cap for Southern Streams moves from 10kgN/ha/yr through to 17kgN/ha/yr over time as long as water quality outcomes agreed by the community are be met.

In short, the consensus was, our method was fit for purpose as it reflected the variability of all the soils we farm on throughout our district.

The next hurdle is getting approval from the regional council and a hearing committee. For me, this process is a fine example of "bottom up governance"- where civic engagement leads the authorities for once and obtains -fingers crossed- a solution which everyone in the community is genuinely satisfied with.



***Process and outcomes of the Nitrogen Allocation Reference Group (NARG) for the  
South Canterbury Coastal Streams area***

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There are many people to thank for getting us to this point and they include Ned Norton whose specialist scientist knowledge was invaluable. I also must mention Dr William Rolleston the Federated Farmers' president for his time and expertise and Lionel Hume our Federated Farmers Policy Adviser. Above all, thanks to all the farmers who were involved-without your will and understanding this would not be possible.

Colin Hurst

**14 October 2014**

**Collaboration not conflict  
A farmer's perspective on consultation**

*Speech by Dr William Rolleston, Federated Farmers President, to the New Zealand Association of Resource Management, Wellington*

Thank you for the opportunity to speak to you today to provide you with a farmers' perspective of engagement, collaboration and action.

I aim to present our view of what is happening, what is working and to articulate our frustrations. I will hope to point out the bottlenecks and make some suggestions for the future.

For those of you who attended the conference last year, Bruce Wills, my predecessor, set the scene very well in the global context.

For those of you who were not here let me briefly recap.

The world's population stands at just over seven billion people and by 2050 that figure will rise to nearly ten billion. Issues of food security are writ large in the minds of governments and populations not lucky enough to have the capacity to feed themselves.

Water availability is a key factor in the food security equation and New Zealand is fortunate to have abundant water and produce enough food to feed at least ten times our population – around 35 million people.

Water is the key resource of the future and that makes us tomorrow's "Lucky Country".

Our modern economy stands unique by being so heavily reliant on the primary industries.

This provides us with both opportunity and challenge.

Our opportunity is that we stand on the doorstep of Asia – a region where incomes are rising rapidly.

Millions of people are moving into the middle class, and with that, comes the demand to eat more animal derived protein. This opportunity is expressed in the government's goal to double the value of our primary exports by 2025.

Here, however, I should inject a caveat.

This goal has never been, in my view, about doubling New Zealand's production that some have unhelpfully suggested. That takes a linear view of the word "value" when doubling value is more about increasing productivity and moving up the value chain not to mention new high value products.

For sure there will be a component of increased production but the reality is that we are losing productive land. No less than 1.4 million hectares between 2002 and 2012.

Our challenge to double the value of primary exports must sit within the environmental footprint we set ourselves.

Our investment in science has a key role in exploiting these opportunities and in meeting our challenges.

While Federated Farmers has asked for an increase in our science spending, that is a topic for another day. However, I will come back to the role science has to play in optimising engagement, collaboration and action when it comes to resource management.

According to Statistics NZ, farmland made up some 54.8 percent of New Zealand in 2007. This means that farmers, as a group of resource managers are responsible for more than half of New Zealand. In addition our products contribute to about 73 percent of our merchandise export earnings.

These are significant responsibilities for our industry and if we get it right, if councils and government get it right, then we will optimise both our economy and our environment.

Everyone in this room will know that it is challenging to develop rules and strategies, which aim to provide for the sustainable use and development of regional resources.

It means balancing, indeed, often trading off competing interests. The risk is that in the end everyone loses something and everyone comes out feeling like a loser.

Resource Management Act processes and other regulatory regimes raise other challenges.

First they need to strike the right balance between the interests of local people with the interests of the wider community. This is not just a conflict between private property rights and public interest but the decision maker needs to decide what weighting they should give to the opinion of locals as opposed to those from outside an area.

The second challenge is to determine what is fact and what is opinion. Added difficulty comes from trying to determine what is opinion predicated on an assumed set of "facts".

Be under no illusion that fear drives public outrage and groups use this powerful emotional response as a weapon to achieve regulatory outcomes. If they are lucky or skilled, or both, the “facts” are forgotten as the outrage seeps in societal consciousness as “ethics”.

Regulatory decisions which on the facts are bad for society can become embedded for years.

We in this room all know that experts don’t always agree, and that risk is not absolute.

These are concepts which create suspicion in the eyes of the public. An articulate expert who provides the categorical is always going to have the tactical advantage over the scientist who makes themselves seem unsure by honestly stating a level of uncertainty.

We see this in many public debates from immunisation to fluoridation and genetic modification. We may even see it in the water quality debate. Persuasion is a product of credibility but in the end it is science and the facts which prevail. For issues where science meets public outrage one has to play the long game.

If I can now dip back into my days of medical training - One of the most useful and enduring psychological observations for me was the description of the five stages of loss and grief by Elizabeth Kübler-Ross in her book “On Death and Dying”. The five stages she described are Denial, Anger, Bargaining, Depression and Acceptance.

While the parallels to the matter at hand are only loose – unlike death we have the opportunity to explore alternative outcomes – the direction of travel does in my mind reflect the process we are going through from all sides.

Three years ago, under a new board and with Bruce Wills at the helm, Federated Farmers made a deliberate decision to move past denial and anger.

We acknowledged that agriculture has an environmental impact and that the way forward was to look for opportunities which would take the environmental lobby and farmers in the same direction. That is not to belittle the understanding and constructive efforts made by our predecessors but we had reached a point of tension and litigation that was unsustainable on all sides and not in the best interests of our country.

Federated Farmers started to talk about the environment and our challenge to the conservation groups has been for them to start talking about the economy – beyond the closed doors of the Land and Water Forum that is.

That said the Land and Water Forum has been a positive development and a well-recognised example of collaboration – the equivalent of Kübler-Ross’ Bargaining.

Engagement and collaboration don’t just happen. They take considerable time and effort. Often engagement requires just the right set of factors. People need to see the issue, they need to understand that it affects them and they need to see that the effort is going to be worthwhile in the end.

In my view, the Land and Water Forum was born out of the futility of the adversarial approach. The building and operation of the Opuha Dam in South Canterbury also provided a real world example that water storage could provide positive outcomes for the economy, for society and for the environment equally.

The Canterbury Water Management Strategy has further shown that with the right leadership it is possible to collaborate while aspiring to multiple and seemingly conflicting targets.

The idea is to create an outcome which is taking everyone in the same direction. The power of collaboration is such that all sides generally come to realise that they agree on many points, if not, a majority of points.

This builds mutual trust and openness enabling what remains to be resolved.

Parties do not get everything they set out for, but with good and strong leadership, backed by science and creative thinking, the outcomes can be positive for all.

The unreasonable risk isolation and being left behind.

Federated Farmers is genuinely looking for opportunities which have this sort of outcome.

For example, our position on climate change recognises that the overwhelming scientific consensus is that climate change is happening and that human activity, including agriculture, makes a significant contribution.

We also recognise that New Zealand farmers are among the most carbon efficient protein producers in the world and it makes no sense to penalise them for being so productive. Rather we should be encouraging them to continue to increase both productivity and production within other environmental constraints.

Using research and development to increase our productivity as well as carbon efficiency is a win for the economy, a win for the environment and a win for wider world food security while playing our part in climate change mitigation.

Creating along the way science solutions which, we hope, will be applicable to other production systems.

It is to Canterbury water that I now turn to provide you a view from the farmer up so to speak.

The regulatory interpretation of the Canterbury Water Management Strategy has been the Canterbury Land and Water Plan. A default plan, setting limits for water quality with the ability for local catchment communities, through ten appointed zone committees, to decide what attributes and aspirations are appropriate for them.

Our local zone committee has had good leadership, strong local representation, a willingness to listen and patience.

Farmers have quickly moved from anger and confrontation to recognising the issues and a real willingness to take ownership of them for positive outcomes. There is recognition that a collective and collaborative approach will create the possible.

But before I go on let me make some points about Overseer.

The use of Overseer as a regulatory tool continues to be contentious.

Overseer is a strategic tool to assist farm management decisions. It essentially allows farmers to rank options and interventions specific to their situation but it is not designed to provide absolute numbers.

Regulators have been enthusiastic to use Overseer to enable them to regulate based on outputs rather than imposing input restrictions.

Farmers understand the benefits and equity on an output based approach, so have been keen not to throw the baby out with the bathwater.

However, if Overseer is to be used to guide regulatory decisions it needs to be accurate, its limitations need to be recognised and it needs to be used in the right way.

We are keen to see Overseer become more reactive and fine-tuned to different situations and farm systems. We are keen to see Overseer used to inform solutions rather than simply provide numbers against which hard rules are made. In short Overseer needs a significant upgrade and Federated Farmers has called for more investment in this area.

That notwithstanding, farmers in my area have worked within the nitrogen allocations to come up with a scheme which they saw as equitable. They rejected grandparenting of nutrients which is the allocation of a property right related to their current emissions.

They also rejected equal allocation per hectare.

Grandfathering risks rewarding those who have been profligate in their nitrogen use while penalising those who have been conservative for whatever reason.

Equal allocation risks a windfall for those who have done nothing while penalizing those who have invested with reasonable expectation. There is good and bad at both ends of the emissions scale.

The solution reached by those of us in South Canterbury provided for flexibility of land use for low emitters – essentially dryland sheep and beef farmers – with realistic targets for reduced emissions for high emitters- for example those who have converted to irrigation and dairy.

The key though is to have all farmers working to best practice and a sinking lid on maximum emissions as best practice improves nitrogen retention. Depending on the state of the catchment, nitrogen freed up from the sinking lid would then be allocated to the flexibility cap or to the environment.

This will draw everyone toward a modified equal allocation over time.

Continued environmental monitoring is critical and the system should be flexible enough to change as more information flows. Indeed for some areas, where there is uncertainty around allocation, a programme of monitoring is being undertaken before final allocations are made.

Water augmentation of environmental flows through the proposed and consented Hunter Downs project will enhance the outcomes for both the environment and for nutrient management and water allocation. Therefore it is not only in the interests of irrigators that Hunter-Downs goes ahead but also for the dryland farmers who will gain more flexibility of land use even without the water irrigating their farms.

Federated Farmers has worked hard over the last four years to bring the primary industry together – at catchment level as I have just described in our part of South Canterbury, at provincial level in Canterbury and at national level - to come up with solutions which maximise our environmental and economic potential. The outcome is similar across all levels and provides a framework while recognising each catchment has its own attributes and challenges.

In some catchments a reduced stocking rate may be the best answer but even in these areas other alternatives exist, such as standoff pads or herd homes, and new novel solutions will become feasible in the future.

Has our local process been perfect? No of course not. In my view there has been a myopic focus on nitrogen limits without really considering the in-stream attributes we are really trying to achieve.

But we have achieved two goals which I consider to be a principle test:

That is any solution must not undermine the business value of the high emitters and secondly it must not undermine the land value of the low emitters.

The outcome in South Canterbury has been one devised by farmers who have had strong leadership and now have genuine buy-in to and ownership of the results.

The challenge for the regulators will be to translate these aspirations into a plan. A plan which has the flexibility to adapt as new information comes to hand.

Other areas have not had such a positive outcome because they have lacked some key elements for success. Broadly those key elements are:

- The first being the composition of those taking part.

- o All stakeholders that will be affected by the outcome should be represented around the table. If important constituencies are left out you cannot, in all consciousness, claim the process to be a collaborative community outcome.

- The second key feature is good information.

- o This should be the best peer reviewed science available combined with local expert knowledge that is openly disseminated to not only the stakeholders around the collaborative table but the constituencies that they represent.

- o Thirdly, you need a Chair who is the master of diplomacy and negotiations, who can keep the stakeholders in the room and is determined to succeed in getting all these players to come to a common view of the future.

- And finally, you need to have realistic timelines so that the process will finish but which also recognizes the time it takes for collaboration to happen.

Food security is a critical issue for the planet over the next fifty years. We must play our part and we, in New Zealand, can play our part with the supply of high quality, safe products to the betterment of our economy, all the while within environmental constraints.

Farmers have always been environmentalists, why else would they dedicate their lives to the land? Farmers also happen to be practical problem solvers.

Engagement is the key in this journey and in particular engagement of the dryland farmers who until now have been passive passengers but whose buy-in is critical for lasting solutions. Federated Farmers and the primary sector have worked hard on these problems and that work is bearing fruit.

With broad engagement, good will, the correct application of science, appropriate resources and time we can skip Kübler-Ross depression and move directly to acceptance on all sides.

This is our goal.

I wish you a fruitful conference and hope this view from agriculture will set the scene for the next three days.

ENDS

<http://www.fedfarm.org.nz/publications/speeches/article.asp?id=1897#.VI9dfHsyOiw>

## **Appendix 8: Irrigation New Zealand article (September 2013):**

See <http://www.irrigationnz.co.nz/news/magazine/>



## NUTRIENT MANAGEMENT

# Framework set to manage land use and water quality

How we manage land use and water quality at the catchment scale remains a challenge. This is particularly true for catchments with sensitive receiving environments. **Andrew Curtis** reports.

As a result TRoNT (Ngai-tahu) and the Primary Sector group have spent the past six months working in partnership to develop a consistent approach to this challenge. As a part of the process the Selwyn-Waihora Zone Committee approached the group to work with Environment Canterbury (ECan) staff to develop an approach to manage the target catchment load for nitrogen and other contaminants at the property level. IrrigationNZ undertook a leadership role in this process.

This article outlines the proposed planning framework for Selwyn-Waihora zone. Key to its success is the definition of Good Management Practice (GMP). All the primary sector bodies have committed to this and are currently working with ECan to define it at the property level through the GMP matrix project.

When considering the following planning framework you should be aware there are some unique characteristics around targets and timeframes that apply in the Selwyn-Waihora catchment. However, this does not mean the model cannot be used elsewhere.

### ACTION 1: OPERATE AT GMP

All land uses operate at or above the defined GMP for their land use and soil type by 2017.

*Theme: Everyone is doing their bit to improve environmental performance (sediment, P, N, microbial, riparian, wetland, agrichemical and water use efficiency).*

### ACTION 2: IMPROVED GMP

Everyone is required to make a percentage improvement on GMP by 2022. The improvement is related to the land uses current impact and the ability to make improvements – technical and financially achievable.

*Theme: An improvement beyond GMP is required to meet the catchment targets. Progressive operators should be recognised and incentivised.*

### ACTION 3: IRRIGATION SCHEMES

A total load is allocated to new / expanding community irrigation schemes. The irrigation scheme determines how the load is distributed among its shareholders. New scheme irrigators must operate at a minimum of Action 2 from the outset. Existing irrigators are subject to the same timeframe to achieve Action 2 as other existing land uses.

*Theme: New irrigation that is part of a Community Irrigation Scheme must operate at the 2022 GMP plus improvement requirements from the outset.*

### ACTION 4: LAND USE CHANGE FOR LOW IMPACT LAND USE

A load is available for low impact land uses outside of community irrigation scheme to intensify. This is only available to land uses which need to change their current land use to remain financially viable. A threshold is set (15kg/N/ha for Selwyn-Waihora), below this land use change is permitted provided it complies with Action 1.

*Theme: Low impact land uses must have future options so they can remain financially viable.*

### ACTION 5: LAND USE CHANGE

It is possible to change land use provided the new land use operates at Action 2 from the outset and the new land use does not have a greater impact than the current land use, or Actions 3 or 4 apply. Land use change may also be achieved through the combining of more than one property or enterprise providing



the resulting impact is no greater than the sum of the previous at Action 2.

*Themes: Retain land use flexibility by allowing for some land use change, but without compromising the proposed catchment targets. Any new land use operates at Action 2 from the outset.*

### ACTION 6: ENSURING COMPLIANCE

Any land use which meets the Actions above is a permitted activity. Any land use which does not meet Actions 1 or 2 is a restricted discretionary activity. A management plan will need to be submitted to demonstrate how the 2037 timeframe below will be met. Any land use which does not meet these requirements by 2037 is a non-complying activity. Any land use which does not meet the land use change requirements in Action 4 or Action 5 is a non-complying activity.

### IMPLEMENTATION

A support package is required for council and farmers, including an independent technical advisory panel to advise consent officers on appropriateness of resource consent applications and management plans (Actions 4 & 5). Also primary sector support is required to help farmers identify their issues and future management options and to develop and audit Farm Environment Plans.

### MONITORING AND REVIEW

Prior to 2022, once each property's data is available, there will be assessment of the current impact from land uses (baseline), the improvement made by achieving GMP, the actual percentage improvements required to meet the catchment target and review of catchment target timeframes and achievability.

## Appendix 9: Reading list for NARG in March 2014

### Suggested readings on different approaches on allocating nutrients

#### General overview of allocation approaches

- Guest & Ford 2011 *Managing catchment nutrient loads: a Review of Different Policy Instruments* Land Use & Water Working Paper # 2
- Ford, R 2012 *Managing scarce resources: Options for allocating catchment nutrient loads* paper presented to the Regional Committee 29 October 2012
- Landcare Research 2013 *Modelling economic impacts of nutrient allocation policies in Canterbury Hinds catchment* MfE report no CR 166
- Selman, M., Greenhalgh, S 2009 *Eutrophication: policies, actions and strategies to address nutrient pollution*. World Resources Institute Policy Note no 3

#### Grandparenting

- e.g. Environment Waikato, 2007: Waikato Regional Plan. Variation No. 5 – Lake Taupo Catchment  
<http://www.waikatoregion.govt.nz/Council/Policy-and-plans/Rules-and-regulation/Protecting-Lake-Taupo/>

#### Natural Capital (based on Land use capability classes )

- e.g. Horizons Region One Plan  
<http://www.horizons.govt.nz/about-us/publications/about-us-publications/one-plan-publications-and-reports/proposed-one-plan/>

#### Property Based Discharge standards (Currently before the Environment Court)

- e.g. Otago Regional Council  
<http://www.orc.govt.nz/Publications-and-Reports/Regional-Policies-and-Plans/Regional-Plan-Water/Proposed-Plan-Change-6A-Water-Quality/>

#### Averaging or equal allocation

- Lilburne, L Webb, T 2012 *An equal allocation for allocation of a total nutrient load within a nutrient management Zone* ECan report no R12/36

#### Auctioning

- New Zealand Fisheries Quota system  
Lock, K.; Leslie, S 2007 *New Zealand's Quota Management System: a history of the First 20 years*. Motu Working paper 07-02. Motu Economic and Public Policy Research. April 2007

#### Nitrates Directive European union

- <http://ec.europa.eu/environment/pubs/pdf/factsheets/nitrates.pdf>
- [http://ec.europa.eu/environment/water/water-nitrates/index\\_en.html](http://ec.europa.eu/environment/water/water-nitrates/index_en.html)

#### Public subsidies to improve water quality – United States

- <http://www.wri.org/sites/default/files/mrbi.pdf>



## Appendix 10: Canterbury Look-Up table Overseer V6 Patch modified and cut down (from Lilburne 2014) to illustrate the agreed NARG framework

Land Use	XL	VL	L	M	H	Pdl	Pd
Arable (mixed grazing+dry) std mgmt	24	19	21	15	7	3	11
Arable (mixed grazing+irrig) std mgmt	27	21	23	21	15	8	12
Arable (seasonal grazing+dry) std mgmt	28	15	15	7	1	1	8
Arable (seasonal grazing+irrig) std mgmt	31	23	25	15	5	3	12
Beef (dry)	41	27	15	13	10	5	8
Beef (Irrig)	55	38	23	21	18	9	12
Dairy (3 cows/ha+winteroff)	47	35	24	21	18	9	12
Dairy (3 cows/ha+winteron)	55	38	23	21	18	9	12
Dairy (4 cows/ha+winteroff)	66	50	35	30	26	13	17
Dairy (4 cows/ha+winteron)	66	49	33	29	25	12	17
Dairy (5 cows/ha+winteroff)	78	59	41	36	32	16	20
Dairy support	51	34	19	16	13	6	9
Dairy support (Irrig)	69	48	29	26	22	11	15
Deer (dry)	10	9	8	8	8	4	4
Deer (Irrig)	32	25	18	16	14	7	9
Dryland Dairy	35	26	18	16	14	7	9
Forestry - exotic (Dev)	1	1	1	1	1	1	0
Sheep (dryland)	9	8	7	7	7	3	3
Sheep (irrig)	27	21	15	13	12	6	7
Sheep/Beef (10% beef+dry)	21	15	10	9	8	4	5
Sheep/Beef (10% beef+irrig)	37	27	18	16	15	7	9
Sheep/Beef (20% beef+dry)	27	19	12	10	9	4	6
Sheep/Beef (20% beef+irrig)	42	30	19	18	16	8	10
Sheep/Beef (50% beef+dry)	36	24	14	12	10	5	7
Sheep/Beef (50% beef+irrig)	50	35	22	20	17	9	11
Apples	8	8	8	6	6	3	4
Summerfruit	8	8	7	5	6	3	4
Berryfruit	12	12	12	8	12	6	6
Vegetables	57	34	23	19	17	8	12

Red land uses must reduce to meet Max Caps (35, 25, 20)

Orange land uses carry on at GMP but can't increase

Green land uses may increase to Flex Cap of 15 (but still at GMP)

## Appendix 11: Summary of pros and cons of N allocation options considered

N ALLOCATION OPTIONS FOR SCCS	Grand parenting	GMP at current land use	GMP based on land use + Flex cap	GMP based on land use + flex cap + maximum cap (Option 1 NARG)	GMP based on soil, rainfall (single land use) (Option 3 NARG)	Modified equal allocation (Option 2 NARG)	Simple averaging	Land use capability (natural capital)
<b>Description</b>	Pins people to what they are currently emitting in 2009-2013 baseline. Consented schemes can increase up to their limit but at GMP.	Everyone must achieve GMP for the land use they were doing during 2009-2013 baseline. Consented schemes can increase up to their limit but at GMP.	Same as GMP for current land use + Plus option allows for any changes at GMP below flexibility cap. Nutrients for the flex cap comes from load provided for gradual intensification (10%) and dryland dairy support (0.75ha).	Same as GMP at current land use and flex cap + With the addition of a maximum leaching rate which no emitter in the catchment can increase above.	Defines a land use such that if everyone did it, the catchment load would not be breached. Everyone receives the load that they would lose if they did that land use on their soil type/climate. Looks at each land use on each soil type in the catchment until the total load (that has already been determined as sustainable) is met.	Catchment divided according to level of productivity. Steep, NPL and then rest of the catchment. Each zone has an average and everyone in the zone receives average load.	The allocable load is distributed equally across. All sources are treated in the same way, regardless of the land use or activity.	Discharge allowance based on physical characteristics of the land or soil type.
<b>Pros</b>	Protects investment of existing high emitting land uses.	Makes use of MGM project numbers when they become available .  Encourage technical efficiency for all users.  Minimises transition requirements and disruption. Relatively simple- benchmarked.	Makes use of MGM project numbers when they become available .  Those who are below the flexibility cap can increase their losses up to it.  Those who are part of a scheme can access the load that belongs to the scheme.	Makes use of MGM project numbers when they become available.  least disruptive out of GMP and flex cap and modified equal allocation options.  Those who are below the flexibility cap can increase their losses up to it.  Those who are part of a scheme can access the load that belongs to the scheme.  Does not require trading and transfers to operate system but could develop over time to optimize it  Provides for specific development in irrigation	Benefits low emitting land uses.  High emitting land uses would need to mitigate less than they would under the modified equal allocation.	Gives low leaching operations flexibility to intensify up to NDA.	Allows low emitting land users some flexibility to develop.  Landowners on high leaching soils will need to apply more mitigation so accounts for different soils and soil vulnerability.	Provides for the more efficient use of soil resources- Env court accepted in one plan.

**Process and outcomes of the Nitrogen Allocation Reference Group (NARG) for the South Canterbury Coastal Streams area**

<b>N ALLOCATION OPTIONS FOR SCCS</b>	<b>Grand parenting</b>	<b>GMP at current land use</b>	<b>GMP based on land use + Flex cap</b>	<b>GMP based on land use + flex cap + maximum cap (Option 1 NARG)</b>	<b>GMP based on soil, rainfall (single land use) (Option 3 NARG)</b>	<b>Modified equal allocation (Option 2 NARG)</b>	<b>Simple averaging</b>	<b>Land use capability (natural capital)</b>
				<p>schemes</p> <p>Max leaching rate may be better environmentally (for rivers) for the leaky soils beside the rivers.</p>				
<b>Cons</b>	Limits development potential with undeveloped land. Rewards people who are doing bad practice.	Limits development potential for undeveloped land. Requires some benchmarking.	<p>The flexibility cap may still limit development potential for undeveloped land.</p> <p>If a higher flexibility cap is desired, it is possible if higher leachers go beyond GMP. Mitigation requirement goes up sharply as flexibility cap rises- less bang for buck as mitigation approaches MFM.</p>	<p>Those over the max leaching rate may have to cut back quite severely or get a notified consent to continue farming over the max cap.</p> <p>May not be any use in applying in Morven/Sinclairs as no environmental benefit to come from the possible economic disruption. This could cause the perception of being unfair as those in the other catchments would need to adhere to it.</p> <p>May require consent for those over it?</p> <p>MGM v1 will change loads and updating of MGM/Overseer- how do we account for it? the flexibility threshold may change with versions.</p>	<p>Middle level of disruption of three methods including economically.</p> <p>Will require trading and transfer to operate and optimized the system.</p> <p>Does not provide for specific development within irrigation schemes.</p> <p>Gives very low leaching climates/soils little flexibility.</p> <p>Restrictive for some high leaching soils/climates requiring mitigation or trading to continue operating.</p> <p>As overseer or look up table and MGM changes then land use will also change. Risk that it will change from 3 cows/ha to 20% sheep and beef irrigated = huge mitigation costs for high emitting land uses.</p>	<p>44% of dairy inside Wainono would have to go beyond MFM- so some quite big economic implications for some sectors and high leachers.</p> <p>Initially most disruptive of three methods highlighted including economically.</p> <p>Will require trading and transfer to operate the system and optimize it.</p> <p>Does not allow for specific development within irrigation schemes- will be hard to get past HDI without making their consent unviable.</p> <p>Restrictive for high leaching operations requiring mitigation or land use change or trading to continue operating.</p> <p>Likely to be unused allocation.</p> <p>Updates to overseer and or MGM- have to figure out how to work in.</p>	<p>Does not recognize existing investment.</p> <p>Requires trading and transfer to operate the system and optimize it.</p> <p>Will cost landowners on high leaching soils more to mitigate then those on low leaching soils.</p>	<p>Adjusting the allowances to match the load that can be allocated requires some subjective judgements.</p> <p>Those that have developed on soil that is deemed to be unable to take the development and therefore have to cut back their N losses creates the potential for some severe economic consequences.</p> <p>There are more contributing factors other than just soil that contribute to the efficiency of a land use in the context of discharge limits.</p> <p>Does not allow for incorporation and use of scheme consent and N loads.</p> <p>Would require trading to work, but then that defeats the purpose of have soil based discharge limits.</p>



