What do we know?

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There has been something of a sea-change in the management of diffuse-source contaminants in freshwater. For instance:

- The Land and Water Forum recommended that central government define national objectives for freshwater waterbodies and regional councils should give effect to these by defining measurable objectives and linked standards and limits.

- The National Policy Statement for Freshwater largely took up this recommendation.

- Environment Canterbury Commissioners made operative Chapter 4 of their Natural Resources Regional Plan which deals with water quality, and which contains numeric environmental objectives and related water quality standards.

The common theme here is a shift from effects-based management of diffuse-source contaminants to limits-based management.

Under effects-based management we judge the acceptability of activities by the potential effects they have on the environment, but under limits-based management we determine how we want the environment to be, and then we set limits to resource use accordingly.

The contaminant "source-to-sink" model supports effects-based management: we feed into this model as inputs contaminants from the land (generated under different catchment development scenarios typically) and the model makes predictions about the potential effects of those contaminants in estuary / coastal receiving waters. But, we can also set objectives for the receiving waters (they have to be numeric), and then run the model backwards in order to determine corresponding contaminant load limits. In this way, the source-to-sink model can also support limits-based management.

There are advantages to this approach:

- It forces us to state up front our objectives for the receiving environment.

- We assess proposed plan changes and activities against the contaminant load limits, taking into account how much of the limits are already taken up by existing activities and how much might be used by future activities, including under climate change. In this way we control cumulative effects.

- With limits in place we can look at ways of offsetting contaminants from different source regions in the catchment, where opportunities for mitigation may be unequal for instance, which gives us options.

- We have precise requirements for mitigation targets.

- Monitoring is informed: we need to monitor loads from the catchment to ensure limits are not being exceeded, and we need to monitor in the receiving waters to ensure that

the benefits that we expect will come along on the back of this scheme are actually being delivered.

- Clarity for all parties.

We have the tools needed to do this kind of analysis, and I would argue that we need to be thinking of limits-based management of diffuse-source contaminants in the Hauraki Gulf to achieve a range of benefits. It will start with setting objectives, working backwards to determine contaminant load limits, planning development and requiring mitigation that will stay within those limits, and monitoring for compliance and outcomes.