

**Table SI1: Questions and answers from the first assessment exercise, where the usefulness of seasonal forecasts for management was explored for a single historic season of interest at each site. Managers were provided with seasonal forecasts for their chosen season of interest, and were then asked a number of questions relating to their interpretation of the forecast, whether it would have been useful to them, and any barriers to usefulness.**

Question	Site	Response
1. What is your interpretation of the climate seasonal forecast? (i.e. what is the most likely outcome for the season of interest, and how trustworthy is the forecast?)	Australia	Researcher: The skill of the climate forecast is too low to make a useful prediction for either of the weather variables.
		Stakeholder: Given the low historic skill scores, these seasonal forecasts cannot be used for decision-making.
	Germany	Researcher: The forecast has very low skill in prediction for all of the relevant climate variables.
		Stakeholder: Due to the very low skill, we cannot use the forecast to say whether next season will be really dry or wet, or for an assessment of the likelihood of draughts or heat waves (the indices of most interest to us).
	Ireland	Researcher: Seasonal climate prediction does not appear to be useful for the target seasons investigated here.
		Stakeholder: Seasonal forecasting based on SEAS5 is not particularly successful at the moment for the west of Ireland.
	Norway	Researcher: Although precipitation was forecast to be 'Above normal' during autumn/winter 2000, the forecast skill is too low for it to be used.
		Stakeholder: The forecast is providing the relevant information (will next season will be really dry or wet? What is the probability of a very hot season?). But for now, there is no confidence in this information.
	Spain	Researcher: There is no skill in the climate seasonal forecast.
		Stakeholder: There is no skill in the climate seasonal forecast.
2. What is your interpretation of the catchment/lake forecast? (i.e. what is the most likely outcome for the catchment/lake variables forecasted, and how trustworthy is the forecast?)	Australia	Researcher: There is some indication that bottom temperatures will be higher than normal for the Mt Bold reservoir, although confidence is low. The skill was too low in the other variables to make any reliable forecasts.
		Stakeholder: The confidence level of these forecasts is very low and difficult to use. I find the high probability (96%) of higher than normal bottom temperature given the low confidence a little odd.
	Germany	Researcher: The model predicts above normal bottom temperature with high confidence. The skill for the temperature outputs of the lake model are remarkably high. Given that the reservoir has a bottom outlet and that there is an exchange between surface layers and bottom layer, we have confidence that the very high probability of the suggested event in the bottom temperature could be taken into consideration.
		Stakeholder: Water temperatures are likely to be above normal, with high confidence in the forecast. However, it is still to be taken with caution .
	Ireland	Researcher: Mean date of migration is predicted to be later than usual, with good agreement between members. However, historic skill was not significant for the model (although >0), so results should be treated with caution.
		Stakeholder: The salmon migration model does a good job of predicting run timing, but that this may be largely down to the use of antecedent weather variables rather than the seasonal forecasts per se.

	Norway	Researcher: chl-a and cyanobacteria are forecast to be in the 'Poor' WFD class. Algal blooms are therefore reasonably likely. Forecast skill is enough that they could inform management in an indicative way.
		Stakeholder: Water quality forecasts have some skill in predicting whether chl-a concentration is likely to be higher than normal, for example. However, the skill of the forecast is not enough to provide the probability of cyanobacterial bloom occurrence or to predict WFD class.
	Spain	Researcher: There is some skill after hydrological modelling and significant skill after lake modelling.
		Stakeholder: Forecasts for water quality variables were skilful.
3. Had these forecasts been available to you before the event of interest, would they have been useful?	Australia	No
	Germany	Somewhat
	Ireland	Yes
	Norway	Somewhat
	Spain	Somewhat
4. If so, how might your behaviour have been different? (answers only given by sites who answered 'yes' to 3.)	Germany	It is of extreme importance to have an idea about the next season, and the high skill of the lake model suggests it could be used as a hint or helpful tool to assess decision making, e.g. as a pointer when developing reservoir management strategies, although it would have been used with caution. Some measures (certain operational rules and procedures) could have been altered in order to prepare for the heatwave.
	Ireland	We would have had some warning about when the busy times were likely to occur, in terms of data collection. We could have ensured that there was good staff availability later in the migration season.
	Spain	I could have talked with my team, show them the results and ask for their opinion, but we would have taken the decision as usual.
5. If not, why not? What are the key barriers to usefulness?	Australia	Historic skill is too low, and so the forecasts are not trustworthy enough. We would just revert to scenario analysis or best guess strategies.
	Germany	Due to the low skill of the climate forecasts it is difficult to have confidence in the lake model forecasts. Before really trusting the forecasts, we would want to try the tool in the future.
	Ireland	Historic skill is too low. Acting on a forecasted late run that then turned out to be wrong could have consequences for fish mortality (more so than acting on an early forecast that then turned out to be wrong).
	Norway	The confidence in the discharge forecasts is too low. We would need higher confidence, and would want the risk of flooding. The chl-a and cyanobacteria forecasts could however have been useful - as an indicator for example that more monitoring should be carried out at the bathing beaches to screen for microcystin.
	Spain	Although forecasts could have been useful, I wouldn't trust them yet. We would have tried the tool many times to be sure that it's providing trustworthy additional information.

6. If the usefulness of the tools and forecasts was limited by uncertainty in the forecasts, what level of uncertainty would be acceptable for you to feel able to act based on the forecast?	Australia	I would want probabilities and forecast confidences at the medium level before I would be willing to suggest alterations to operation or pumping strategies, etc.
	Germany	Trying the tool in the future will help guide us on which confidence threshold we should require before we act based on the forecasts.
	Ireland	As fish mortality is the end result of getting the forecast wrong, we would need uncertainty to be low before we would change our current labour-intensive operating procedures.
	Norway	Reasonably high confidence. We would need to discuss with the power plant operators and see how reliable the forecast was over several years.
	Spain	The model is already showing high skill, but we would try the tool many times to be sure it's providing trustworthy additional information.