For full methodology and additional details please see the recent publication "Assessing the value of harmful algal bloom forecasts in the Pacific Northwest" by Dr. Di Jin and colleagues in the ICES Journal of Marine Sciences: https://doi.org/10.1093/icesjms/fsae126

To estimate the value of HAB forecasting, they first defined the value function for different actions under different states of nature without prediction and with prediction. In the PNW, the relevant decision-maker can be commercial fishers, recreational fishers, or public shellfish managers. In this case, there are several layers of decision-makers, including decisions by state managers of the fisheries and of public health authorities, plus the actual decisions of the fishers or fishing organizations. It is a multifaceted decision-making process. The PNW HAB Bulletin is provided to shellfish managers, who are the gatekeepers acting on behalf of the private sector. Recreational and commercial fishers' decisions are conditioned on fishery managers' open/closure decisions. In the meantime, the PNW HAB Bulletins are posted online, and the LiveOcean forecast is updated daily. The information is then used directly by the private sector to make relevant decisions. Researchers quantified the value of HAB predictions to fisheries and fishing communities by calculating the expected difference between economic value when predictions inform decision-making versus the value when they are not used.

The value of information (VOI) quantification involved four steps:

1. Measuring the economic impacts (e.g., harvest losses) of HAB events in the absence of prediction.
2. Characterizing the prediction itself, focusing on the situation in which the goal of HAB prediction is to predict the occurrence or non-occurrence of a large-scale event within a season. The value of HAB prediction depends on the accuracy or skill of the prediction.
3. Examining how decisions would be made in light of a HAB prediction. This step involved identifying a range of potential responses by public and private decision-makers and evaluating their economic consequences.
4. Developing an overall measure of annual prediction value using the model described above.

The figure on the right displays the value of HAB forecast by event frequency and forecast precision. The estimated annual cost of the warning system is $1.5 million (indicated by the horizontal green line, according to Vance et al. (2019)). **Assuming 90% accuracy, the warning system cost is below the value it generates, if the HAB event frequency is higher than once every 10 years, which has been the case in the past three decades.** The downward sloping curve depicts values associated with 100% (blue), 90% (red), and 80% (black) forecast accuracy, respectively. Note that HAB event frequency is lowered moving along the horizontal axis from left to right (from once every 5 years to once every 30 years). The green line indicates an estimated annual cost of the forecast and the green star a threshold to the left of which utilization of the forecast is economically feasible.