NSW Oyster Transformation Project: Building Sustainability and Profitability in the NSW Oyster Industry

WHAT?

A research project aimed at modelling the links between salinity and temperature and *E. coli* bacteria, harmful algal blooms (HABs) and oyster diseases such as Winter mortality and QX, so that oyster harvest management can become simpler, faster and with fewer closures. Newer, faster ways of monitoring will be developed and trialled.

WHO & FUNDING:

Industry and Research: Shauna Murray, Penelope Ajani, Arjun Verma and Swaminathan Palanisami (University of Technology Sydney); Mike Dove and Wayne O'Connor (NSW Department of Primary Industries), NSW Shellfish Program (NSW Food Authority), *Other Partners*: The Yield Technology Solutions Pty Ltd, Hunter Local Land Services, and *Funded by*: Food Agility CRC.

WHAT WE ARE DOING:

This research project involves the deployment of real time sensors to collect detailed data on salinity and temperature from 13 sensors in 12 NSW estuaries. We will correlate this data with weekly sample results on microbial communities – data obtained using high throughput genomic sequencing (DNA). Environmental data and The Yield's sensor data will also enable researchers to model the prevalence and intensity of HABs and key oyster diseases. The research will work towards the development of a series of models for event prediction and risk management.

WHAT DO WE NEED FROM INDUSTRY?

Industry support is vital to the success of this project. During the project workshops, we will supply complete sample kits to volunteers and train them how to sample. We will visit the samplers frequently to collect samples, to discuss the project and to get feedback.
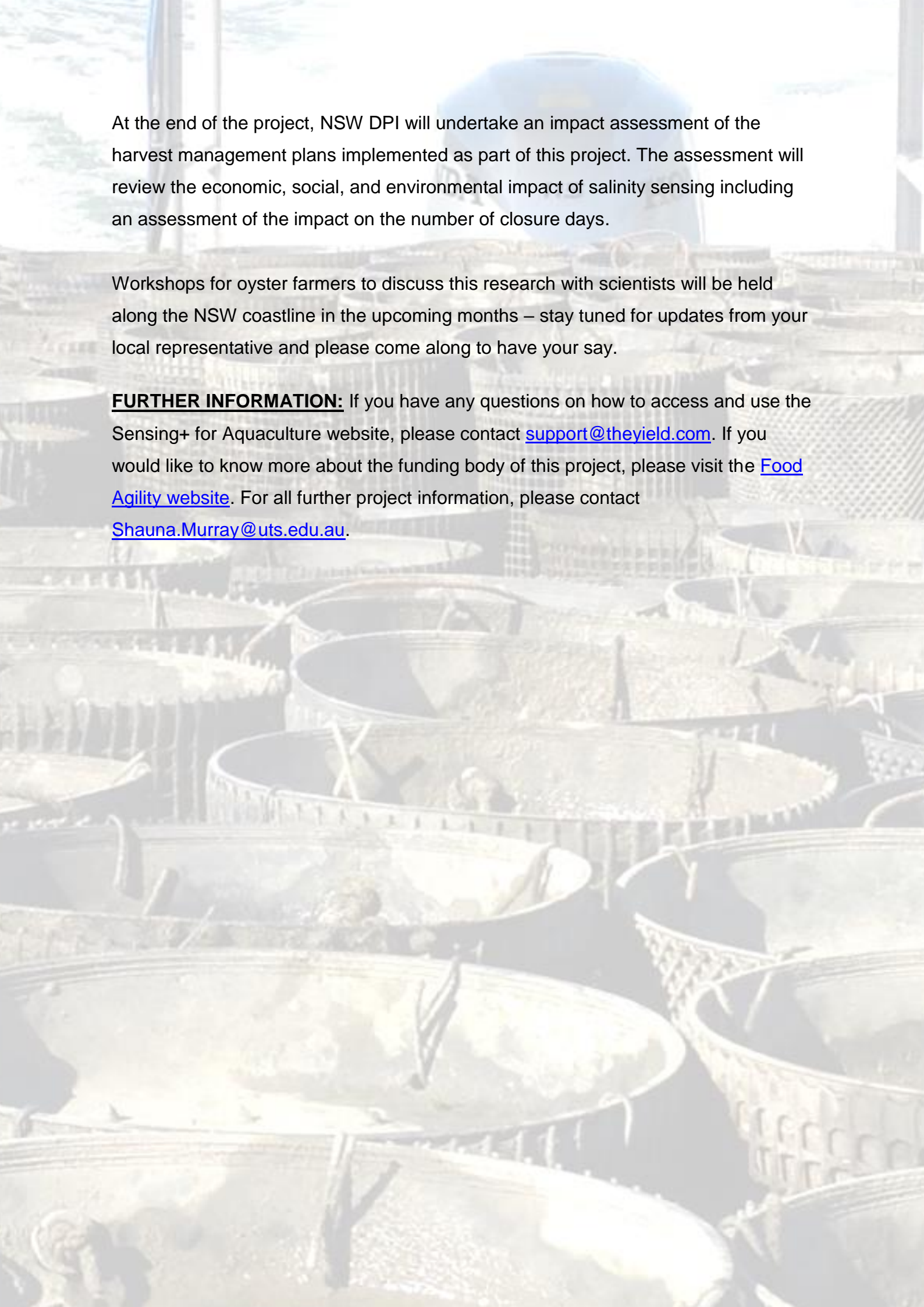
Through use of the The Yield *Sensing+ for Aquaculture* (website for mobile or computer), farmers can log harvesting details. In the case of a mortality event, we can use this information and the data collected as part of the project to help determine the cause or sequence of events that led to loss of product.

HOW WILL THIS HELP THE OYSTER INDUSTRY?

The technology developed in this research will allow many variables to be collected simultaneously across the state's oyster producing estuaries at a high frequency (as sample processing costs are relatively low), and results can be obtained within hours (in the future on site). This may enable the following benefits to be recognised by industry:

- Salinity levels are generally lower after rainfall events, and a measure of salinity might allow regulators to directly infer the farm status without having to wait for microbiological testing. Currently, we do not have the information needed to know whether there is a strong link between salinity and *E. coli* bacteria for each estuary, or exactly what that link is. Data models based on salinity and *E. coli* will be developed to improve the precision of NSW Food Authority's harvest management plans – there is potential to safely reduce the number of farm closure days that are spent waiting on biological lab results, which would boost industry-wide productivity and farmer revenues.

- Oyster diseases like Winter mortality and QX cause significant loss of product for farmers. The outbreak of these diseases are known to be related to environmental factors, but currently we can't predict when or how severe outbreaks will be. By taking regular samples of oysters and correlating them with environmental factors like salinity and temperature, we expect to better understand these diseases and to potentially introduce early warning notices to farmers.

- HABs caused by algae such as *Alexandrium, Dinophysis* or *Pseudo-nitzschia* that result in PSP, ASP and DSP-related harvest closures, currently occur at a rate of ~20-30 toxic events per year in NSW. Gaining in-depth information on the algal community and related environmental factors could lead to predicting when a closure is likely to occur and similarly equip farmers to better prepare for these events.

At the end of the project, NSW DPI will undertake an impact assessment of the harvest management plans implemented as part of this project. The assessment will review the economic, social, and environmental impact of salinity sensing including an assessment of the impact on the number of closure days.

Workshops for oyster farmers to discuss this research with scientists will be held along the NSW coastline in the upcoming months – stay tuned for updates from your local representative and please come along to have your say.

FURTHER INFORMATION: If you have any questions on how to access and use the Sensing+ for Aquaculture website, please contact support@theyield.com. If you would like to know more about the funding body of this project, please visit the Food Agility website. For all further project information, please contact Shauna.Murray@uts.edu.au.