



CASE STUDY

KYLE THOMSON

Teaming up with WMS to Facilitate Innovation in Water Engineering

BACKGROUND

Kyle's curious and competitive nature meant he was always destined to succeed. He achieved chartered status as an engineer and became a Registered Professional Engineer of Queensland (RPEQ) in almost record time. Most people achieve this status in a period of between five to ten years, with the absolute minimum being three years. Kyle managed to gain the qualification in four.

Graduating during a downturn, there were not many engineering jobs around. With opportunities limited, he started off as a drafting designer – working out of his employer's garage - and concedes he *"was probably pretty lucky to even get that role to begin with"* considering the market. However, he took it in his stride and saw it as a starting point, working on subdivision designs and stormwater management plans for local councils.

Eventually, with his sights set high, he landed jobs with big firms in the engineering space, namely Pitt & Sherry, Hatch and KBR. Mark Dugan was lucky enough to work with Kyle at two of these firms and remembers him as being *"friendly and helpful"* as well as *"passionate and driven"*. He goes on to explain that Kyle *"will go above and beyond what is expected of him. He always likes putting in extra hours and extra effort just to deliver above standard."*

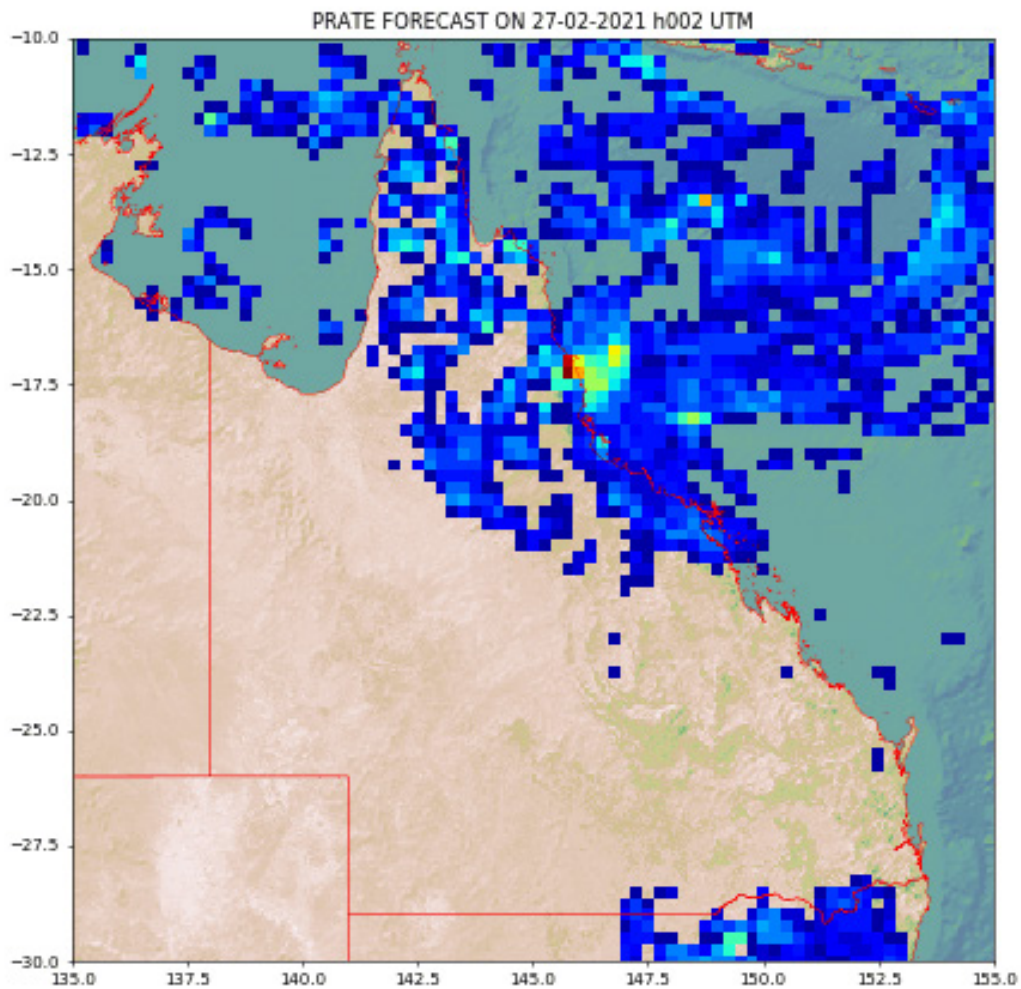
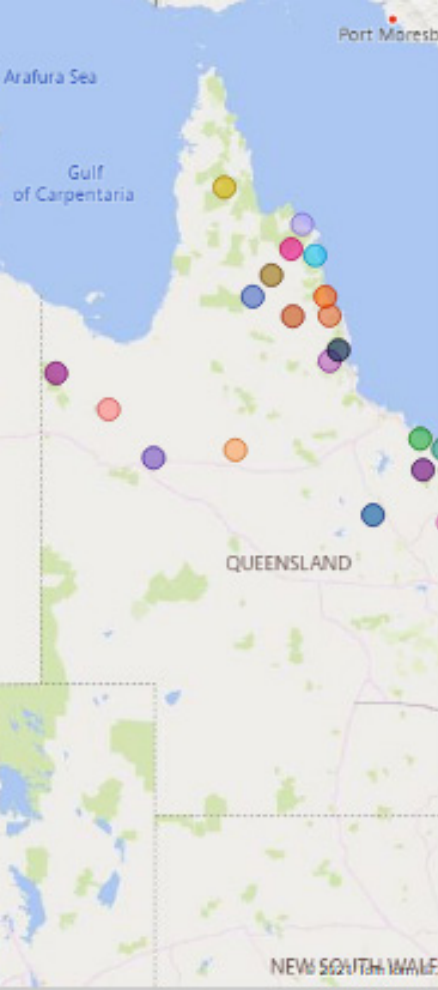
Mark also remembers Kyle as a team player saying, *"He'll do his own thing in his spare time at home to improve the way we work. And he'll share that with the rest of the team."*

"Kyle will go above and beyond what is expected of him. He always likes putting in extra hours and extra effort just to deliver above standard."

Mark Dugan



Kyle has extensive experience performing inspections as a drainage/hydraulic engineer. This image shows an industrial site where Kyle inspected an existing drainage network and several cross-drainage structures.



Rainfall forecasting model developed by Kyle using Power BI and Python. The model forecasts flood depths 120 hours ahead for creeks and rivers along the Queensland coast. The model generates weighted IFDs of catchments and compares them to BOM's gridded IFDs in real time. The model is updated every 6 hours as new forecasts become available.

WHY THE MOVE TO WATER MODELLING SOLUTIONS?

Looking back on his experience with other employers, Kyle came to realise the importance of relationships, honesty and integrity. He says, *"At the end of the day, clients put trust in us to do the right thing. They rely on us to be open and honest. There's so much engineering judgement that goes in (to an assessment) that integrity becomes very important."*

Kyle had always dreamed of joining the big tier firms and says, *"I always thought they had these secrets nobody else knew, and they were the best of the best. And that's where I wanted to go. They were on a pedestal."*

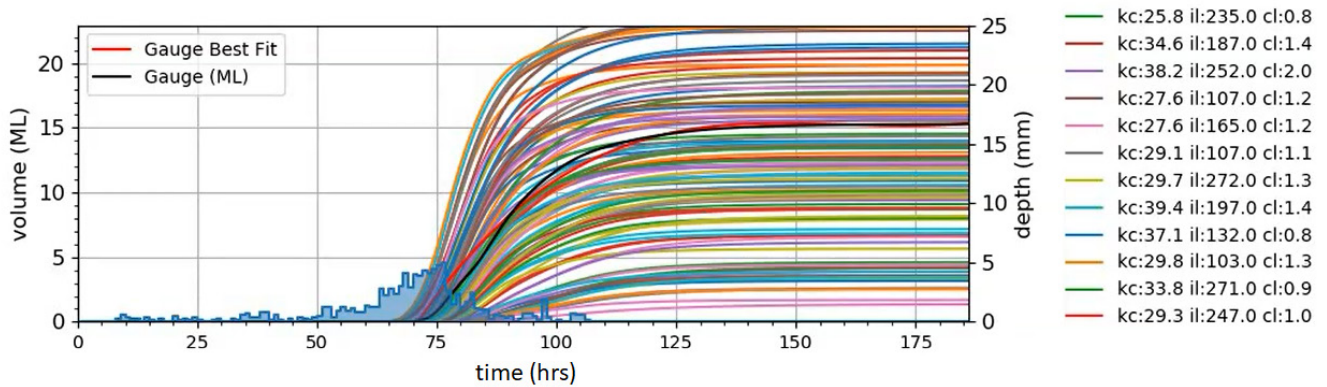
The big tier firms definitely provided a great deal of experience. Kyle worked with some of the biggest names in the mining sector including Glencore, BHP and its offshoot BMA, and was able to deliver large scale mining projects. He also worked as the technical engineer and reviewer for arterial road and rail infrastructure projects ranging in locations from Brisbane to Victoria, Tasmania and even Canada.

He gained both civil and water engineering experience as he tackled technically difficult work. Kyle was *"quite happy to just step into the fire and ask what the biggest problems were that needed resolving?"* He saw this as the best way of gaining experience.

But as time went on, Kyle realised something important was slipping away. He says, *"I did all the things you would dream of as a grad, but then the penny dropped when I realised I had lost my direct involvement with clients."*

This is where WMS came in, offering Kyle a rare opportunity in this industry. They were big enough to provide challenging projects for Kyle but not so big that the client relationship became lost. Kyle says, *"I realised the best value I can add to the community and the best impact I can have, would be in a smaller company doing the things I was doing before for the big companies."*

RORB MONTE CARLO (1000 Simulations) - Jan 2013 Event



Automating RORB model calibration using Python - another tool Kyle has developed. The script simulates thousands of hydrologic scenarios for model calibration, reducing model uncertainty and providing reassurance for estimating large catchment design flows.

A PERFECT FIT

Kyle found a perfect match in WMS with the company reflecting his own values. WMS is very client focused and approaches every project with the objective of finding a solution. That doesn't mean fudging data and giving the client what they want for the sake of completing a project. It means burrowing down and looking at a problem from various angles to find a solution that delivers an honest, safe and sustainable outcome.

And if there's something that Kyle loves, it's a technical challenge. Even as a child, he took pride in competitive chess and outwitting opponents. In more recent times, hobbies include a permaculture garden where Kyle has overseen the creation of an ecosystem and automated irrigation system to have it all thriving.

INNOVATION

In his free time, Kyle is also developing a flood forecasting system that uses industry leading techniques and is capable of being applied to any catchment in Australia. He humbly downplays his work, saying many are working on similar models. But it's quite extraordinary work, especially from someone so young. Kyle is essentially disrupting a part of the engineering landscape, he says *"there's just not enough time for someone to pick up programming to the point of training AIs and fully automating systems, whilst being able to interpret, understand and deliver flood risk related work. On top of this, work with and understand the needs and wants of stakeholders and the community. I hope with my experience and with time I can bring all of these pieces together."*

WMS are right behind him though, helping to fund his research and encouraging this innovative approach.

With Kyle's determination and his curious and competitive qualities being nurtured by WMS, it won't come as a surprise to anyone that knows him to see Kyle succeed with this project and others he's kept on the back burner. And that can only be a good thing for water engineering and the general public who rely on accurate data to remain safe.

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