

## Can't stop the floods, but aim high during restoration and recovery

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**ABSTRACT:** In March 2017 the Tweed Valley experienced its worst flooding on record as a result of ex-tropical Cyclone Debbie. The disaster resulted in the deaths of six members of the community, the flooding of over 2,100 homes and businesses, and many millions of dollars of damage to private and public infrastructure. In the wake of the disaster, Tweed Shire Council was faced with an enormous cleanup and restoration task estimated at approximately \$45M. Damage included \$25M of road infrastructure, \$5M for dozens of buildings, \$2M for flood levee, local airport, waterway infrastructure, and multiple pump stations and treatment plants within Council's water and wastewater systems. Council also collected the equivalent of two thirds of the annual household waste volume within the first few weeks following the event. Furthermore, clean-up and restoration was hampered by the inundation of Council's main depot; resulting in the loss of the depot administration building, workshops, stores, and almost one third of the plant and vehicle fleet. As well as the usual restoration and recovery actions, Council responded with a suite of novel approaches aimed to enhance outcomes for the community while reducing the long term impacts of the flood. These included free building damage assessments, free health advice for food businesses, raising more than \$440,000 in the Mayoral appeal for those unable to access insurance or grant funding, expanding voluntary house purchase areas, free land swap for businesses situated on flood prone land, a "no wrong door" policy for businesses, and delivering all restoration works on top of the existing \$60M capital works program.

**KEYWORDS:** flooding, emergency management, disaster, clean up, restoration, recovery.

### 1 Introduction

Tweed Shire is situated in the far north-eastern corner of NSW adjacent to the NSW/Queensland border and the South Pacific Ocean. Covering 1300 square kilometres, the shire lies in a naturally formed caldera through which the Tweed, Oxley and Rous rivers run. The population of 90,000 is spread between urban communities, coastal and rural towns and more than fifteen villages.

Tweed Shire Council is the largest Council on the NSW far north coast, with an annual budget of almost \$200 million. It is the largest employer in the Tweed; with a workforce of more than 700 employees.

Floods are an expected natural event in the region with average rainfalls over 1600mm. On Thursday 30 March, Council was alert but not alarmed as it prepared for the predicted 350mm of rainfall. But that night, the situation changed quickly and ex Tropical Cyclone Debbie (Category 4) dumped record rainfall totals on the Tweed Valley resulting in the worst flooding event on record.

With the rapid escalation of warnings that afternoon, it left Council, residents and business owners unprepared.

The disaster resulted in the deaths of six members of the community, the flooding of over 2,100 homes and businesses, and many millions of dollars of damage to private and public infrastructure.

In the wake of the disaster, Tweed Shire Council was faced with an enormous cleanup and restoration task estimated at approximately \$45M. Damage was spread across most of the south and inland parts of the shire. Road infrastructure was particularly hard hit, but also included buildings, levees, the airport, jetties, and parts of Council's water and wastewater systems. The unexpected inundation of Council's main "higher" depot; resulted in the loss of the depot administration building, workshops, stores, and plant and vehicles valued at \$6.9million (and including earthmoving plant, 38 trucks, 26 cars and \$500,000 worth of small plant).

One challenge faced was the expectation of continuity of services across the Tweed, with the coastal and northern portions of Tweed with little to no impact, and the southern inland

areas of Tweed declared a natural disaster area.

As well as the usual restoration and recovery actions, Council responded with a suite of novel approaches aimed to enhance outcomes for the community while reducing the long term impacts of the flood. These approaches are outlined in this paper, including some of the challenges encountered, managing community expectations and overall lessons learned. The objective is to provide information for the benefit of any Council facing or planning for similar situations.

## **2 The first week and the “usual” responses**

In an event of this magnitude, there are simply too many stories to capture all of the impacts and responses that occur. The following section provides some key issues and moments chosen to describe the initial situation and highlight some of the responses Council is used to implementing.

By the morning of Friday 31 March flood waters were beginning to recede from higher ground but lower areas would remain inundated for several days and many roads and bridges were destroyed; hampering access.

Council's engineering teams were beginning to inspect accessible assets and prioritise responses to damaged critical infrastructure. Council's Roads & Stormwater Unit fast-tracked introduction of electronic tablets to enable damages to be GPS located, photographed and categorised in the field and directly uploaded to the asset database. This improved accuracy of data and was a crucial tool for Council to manage the almost 1600 road damage items across the shire.

Bray Park water treatment plant and no.1 water pump station which supply 90% of the shire were without power, and water reservoirs had only a few days supply. With water still flooding much of the shire, Council ironically had to issue an alert to “please minimise water use”.

On Saturday 1 April, Engineering rebuilt the southern access to Murwillumbah across the washed away Blacks Drain culvert in 14 hours. The Operations Coordinator had to wipe river mud off the laminated list of contract plant suppliers in his office before ringing them. New sewer pipes were collected from the

materials depot by boat. By 8pm the team had restored temporary access to town and the link to essential water and sewer services for over 60 residences.

The Water Unit gained access to the Moobal Wastewater Plant and started bringing it back online. Works were still ongoing at Tyalgum water and wastewater plants and at the large number of sewer pump stations without power.

Also on Saturday 1 April, Council turned on Facebook and Twitter accounts for the first time. Social media was planned to be launched in July 2017, but was “fast-tracked” due to the flood. Followers grew from zero to 1,200 by the end of the first week, and then to 10,000 – helping to distribute vital information throughout the community – but setting the Comms team on a steep learning curve.

Council's waste facility remained isolated by flood waters until Monday 3 April. There had been community concerns about the growing mountains of clean-up waste, but this was soon overcome once collection of debris and discarded belongings began in the worst hit areas. During this time normal waste services had continued in unaffected coastal areas with Queensland offering to accept the waste. In the first two weeks following the event, Council collected 18,000 tonnes of waste which is equivalent to two thirds of the total annual household waste volume. Long entry queue delays were experienced, further exacerbating the shortage of available tip trucks, and opening hours were extended to provide greater flexibility to Council and the community.

By Tuesday 4 April, Council lifted a boiled water alert for Uki and surrounding villages after the system was flushed, chlorinated and refilled by water tanker. Refill by tanker would continue for another three weeks until the Uki water treatment was operational again. The submerged Tumbulgum Vacuum Sewer took seven days to get back online.

Council's Contact Centre and Communications Unit answered over 2500 phone calls in the first week (averaging more than a call per minute or greater than double the normal volume).

On 6 April the Shire officially moved from response to recovery with the Disaster Recovery Centre opening in Murwillumbah.

By this stage the majority of Council services and facilities were back to ‘Business as Usual’ where possible. There were still some isolated

communities but temporary works were underway to provide them access.

Council's communication and community focus moved onto issues like public health, mosquitos and fire hazards.

Mental Health support became a priority, both for staff and the community, as the realisation of the impacts of such an event began to hit home.

### **3 Novel approaches to recovery**

As well as the usual response and recovery actions, the scale of the event brought out some less orthodox approaches from Council.

#### **3.1 Fleet of foot**

At 11am on Friday 31 March, a loader drove through flood waters to Council's main depot and reported significant damage. By Saturday morning the 2m of water had subsided to reveal 64 vehicles damaged and \$500,000 of handheld tools destroyed. There was no electricity; no workshop; no stores; no computers; no dry paperwork; and 60,000 litres of contaminated fuel. Council's Fleet Section cleaned filters and fuel and had a handful of vehicles operating by Sunday. Within days a fuel polisher from Brisbane was cleaning Council's fuel in-situ, the first of over 60 hired trucks & utes were on site, and the first insurance assessors were inspecting vehicles & paperwork for each write-off or write-down.

Over the coming weeks, Council placed its name against all the floor stock available and purchased all the chassis possible landing in Melbourne from Japan. The Fleet Section negotiated buy-backs of truck bodies (rather than have the insurers sell them as salvage) to avoid time-consuming new builds and used booked build slots on the normal fleet replacement program for body-swapping instead. At one stage Council had 50 trucks being built or having bodies swapped through suppliers in Melbourne, Adelaide, Lismore, the Gold and Sunshine coasts. This proactive approach enabled Council to replace \$7M of damaged equipment in 7 months.

At the start of the flood emergency, Fleet had no Business Continuity Plan to guide replacement purchasing. After the recovery, Council's Fleet Coordinator was invited by the Institute of Public Works Engineering Australasia (IPWEA) to write a best-practice BCP for local government.

#### **3.2 No wrong door policy**

The community quickly realised the significance of the event and large numbers of volunteers turned up to assist those who had lost everything. Council also realised, firstly organically but then purposely, that a "No wrong door policy" was needed to help distressed residents and businesses navigate the complexities of dealing with government. From as early as Friday 31 March, several Council units were out on the streets helping:

- Council's Economic Development Unit was going door-to-door in the worst hit areas trying to "be everything to everyone". The staff organised garbage pick-ups, Hazmat collections and structural/health assessments; provided guidance on insurance issues; and generally listened to those in need of support. That information proved valuable and helped to inform the actions and priorities for Council and recovery agencies. The approach was well received by the community and provided a Council face well before machinery and labourers arrived to clean-up the mess.

The Unit continued to door knock right through to the recovery phase and beyond and was instrumental in ensuring distressed, confused and some illiterate residents and businesses received assistance. Tailored to the particular "pain points", the assistance helped residents meet grant requirements, grant deadlines, and even negotiated state government support for the Mayor Appeal to ensure businesses didn't fall through the cracks.

The Unit worked closely with the Small Business Commissioner on securing Category C funding for businesses, delivering it quickly, and supporting events such as a business recovery breakfast attended by more than 200 people.

- Council's Environmental Health team and Building Surveyors swapped their regulatory role and visited the worst hit areas to offer free building damage assessments, free health advice for food businesses, triage high need individuals and businesses and connect them to appropriate assistance. Not knowing what issues would await them, the brief from management was simple: use your professional judgement to solve problems for those in need.

Again, the approach was very well received by the community; providing immediate solutions to structural, regulatory and health concerns on site. Several businesses saved thousands of dollars when structural issues were identified early or when the suitability of food above the flood water mark was confirmed; thus avoiding the need for disposal.

Council's responsibilities are usually clearly delegated to particular units within the organisation and the change to a "No wrong door policy" did create some moments of confusion, inefficiencies and even friction. However, the benefits, both immediate and long-term, have shown that this approach was the correct one for the community; and one that Council would follow again in the future.

### **3.3 Tweed Mayoral Flood Appeal**

On Monday 3 April, the Tweed Mayoral Flood Appeal was launched for those businesses and individuals unable to access insurance or grant funding. The outcome of the Appeal was more than \$440,000 donated by individuals, organisations, businesses, clubs and schools from across Australia plus \$10,000 in gift vouchers from a gold coast shopping centre. Council setup an independent four-person panel, a clear application and assessment system, and a process with three rounds to provide immediate and longer term support. This resulted in distribution of 100% of the funds to 401 eligible residents and businesses to help them get back on their feet. Notably, the community accepted the outcomes of the process and Council avoided any claims of unfairness or bias which can plague such appeals.

### **3.4 Volunteers vs sightseers**

One significant challenge after the event was the sheer volume of good will and the unexpected impact of Disaster Tourism. Community groups and individuals from all over the Tweed and interstate activated and all wanted to help with donations of goods, food, equipment and time.

Large numbers of trucks/buses and cars arrived in streets; already crowded with mud, debris and piles of rubbish. This brought with it a wide range of challenges & disruptions, additional logistics, and community angst as we were confronted with "disaster tourism" at a scale no one anticipated. Thankfully the reports of looting and scrap collection were isolated; however on the 5th April, Council used traffic controllers to close the village of

Tumbulgum to visitors due to the influx of "disaster tourists" and their impact hampering crucial sewer and clean up works.

### **3.5 Repairing damaged assets**

The long-term and financial impacts of these events hit Council hard, with a total estimated damage cost of \$45 million. Damage included \$25M of road infrastructure, \$7M for fleet, \$4M for flood assets, \$3.5M for dozens of buildings, and a further \$4.5M for local airport, waterway infrastructure, sportsfields and multiple pump stations and treatment plants within Council's water and wastewater systems. Completing these works was further complicated by strict NDRRA disaster funding conditions and the need for Council to still meet its existing \$60M annual capital works program.

From day one, Council aimed for speedy implementation of the restoration works. By the time the official 21 day emergency period ended, Council had formed a new Flood Restoration group, overseen by Council's Senior Construction Engineer and staffed by temporary contracts & casual staff and in-house consultants. This group's objective was to minimise delays to restoration works and the out-of-pocket cost to Council. Meanwhile Council construction staff and existing contractors continued with the existing works program.

While damage to road, stormwater and bridge assets were still being assessed, the shortlisting of six construction companies occurred in July 2017. Feedback from the tenderers assisted staff to define seven tender packages comprising of 1,500 minor to medium damage items. The damage items were bundled based on work type and geographic areas to maximise on-the-ground efficiencies and with the aim of completing all items in an area. Contracts started being let in September 2017 with all minor works completed by September 2018 at a cost of \$6M. The remaining 60 plus complex repair jobs required specialist geotechnical investigations or significant engineering design and accounted for the bulk of the repair bill at about \$16 million. Several overdue 2016 flood repairs were also included in the eight bundles. Works included multiple bridge, culvert and landslip repair packages carried out by construction companies that were completed by December 2018 – six months ahead of the NDRRA funding deadline. The \$3.2M replacement of Byrrill Creek bridge, completed by Council construction staff in June 2019,

included asset betterment and was 50% funded via alternative state government grants.

Within weeks of flood waters receding, flooded building assets were cleared of debris, internal cladding removed, sprayed for mould and allowed to dry out. Repairs were then prioritised on operational need and works carried out by building contractors under supervision of Council contracts staff. Community building restorations experienced additional pressures from displaced groups (community daycare, soup kitchen, artists, hall committees), legacy tenancy issues, and even some unexpected betterment funding for one condemned asset. Early engagement with insurance assessors ensured early confirmation of budgets and timely completion of works.

While water and sewerage services were restored to normal within weeks of the flood, further repairs and improvements worth some \$3.5 million were generally not eligible under NDRRA funding. All repairs were completed in 2018, with some longer term improvements to occur as part of future capital works upgrades.

After insurance and NDRRA payments, Council's total funding shortfall for restoration works was approximately \$10 million. Approximately 40% of this capital replacement spend was already planned for future years; effectively bringing planned spend forward. The remaining shortfall has been funded through reductions in Council's cash reserves and future operating and capital budgets.

## **4 Better future outcomes**

### **4.1 Flood resilience**

Since the floods, Council has secured seven individual grants to better understand flooding and improve flood-resilience in the shire through additional river and stream gauges, a flood study of South Murwillumbah and new voluntary house purchase and house raising schemes.

Voluntary house purchase schemes are highly effective but very expensive. State government restrictions on voluntary house purchase funding has meant that despite high interest in the scheme (50 expressions of interest received), not all residences are eligible. Six properties have been purchased since March 2017, however further progress has been restricted due to legacy subdivision and zoning permissions, ineligibility of vacant

land, triggering of just terms compensation for back-zoning, and the long NSW funding process.

### **4.2 Industrial land swap**

Perhaps the most significant action for future floods was prompted by photos of the 1921, 1954 and 1973 record floods on the General Manager's wall. To provide meaningful flood mitigation in the South Murwillumbah Industrial Precinct, businesses will need to relocate; and the idea of a free land swap for businesses situated on flood prone land was born.

A traditional engineering solution like a levee is not possible in South Murwillumbah but flood free land at Industry Central is available in close proximity. After intense negotiations, the state government provided \$3 million from the Climate Change Fund for Council to purchase 14 hectares of land in August 2018. Council has applied for a further \$3.6 million from the Growing Local Economies Fund to subdivide the land.

The idea is for Council to swap its flood free land at Industry Central for flood affected land owned by impacted businesses. The key benefits are removal of high value, high employment businesses from the floodplain; immediate reduction in flood damage exposure; encourage economic growth by providing up to 20% more land for business expansion; and to remove impediments from the old properties to improve floodplain flows.

While the scheme has relatively low cost to government, Council is still in negotiations to secure a second round of state government funding. Divergent views on benefit quantification and an apparent ongoing preference to fund traditional mitigation will need to be overcome to finalise the scheme.

In the meantime it is hoped the delay will not significantly impact the initial overwhelming support by landowners. Council will continue to pursue this once in a generation opportunity to ensure the community's hardship translates to positive long-term improvements.

### **4.3 Disaster funding improvements**

Through 2017 and 2018, Council participated in the NSW Office of Emergency Management's (OEM) pilot program to develop the state's implementation of the new Disaster Recovery Funding Arrangements (DRFA) from the Federal government. Council has been able to provide practical advice on a range of issues including eligible restoration works, damage cost assessment and timing of

approvals. Council's use of tablet based asset software for field data entry, together with an in-house database enabled efficient and accurate tracking of the almost 1,600 damage items through multiple review and approvals stages; and has positively influenced OEM's future approach under DRFA.

Further work is still required given: many councils have not supported the new cost-sharing arrangements under the DRFA; and the rules each Assessing Agency uses still need to be clarified and standardised.

#### **4.4 Coronial Inquiry into flood deaths**

Six deaths were attributed to the flood, and each of these weighed heavily on the community. Three were particularly upsetting and were the subject of a coronial inquiry. On Monday 3 April 2017, a vehicle carrying a local mother and her three children skidded off a muddy road into the swollen Tweed River. One child miraculously escaped and swam to safety but the other occupants drowned. The accident affected the entire community at every level and made national headline news.

Council cooperated fully with the Coroner, whose findings were handed down in May 2019 and included recommendations for Council to address. The Coroner found that the road should have been closed, however Council's resources were overwhelmed by the scale of the flood. The Coroner also found Council's actions following the accident have been proactive and will minimise the risk of another tragedy by installing guardrail at the site, improving staff capabilities to identify roads requiring closure, reinvigorating the community "flood spotters network", timely posting of road closures on the MyRoadInfo website & Emergency Dashboard, and greater focus on dissemination of road closure notifications & information.

#### **4.5 Response and Recovery networks**

Following debriefings, Council's internal Crisis Management Group membership has been updated to include support and liaison from Communications and Community Services units to ensure timelier customer interactions and better transition to recovery responsibilities.

The Community & Cultural Services Unit also applied and received a grant to recruit a

Community Development Officer for a period of two years. The objective of the position has been to build capacity within Council, the Local Emergency Management Committee (LEMC) and volunteer networks in the community so that recovery roles and responsibilities are clearer during future events. The outcomes of this work will be used by Office of Emergency Management as a blue print for other LEMCs across NSW.

#### **4.6 Emergency Dashboard**

Feedback after the event showed the community had struggled to locate appropriate and timely emergency information; perhaps in part due to the very different role local government plays in nearby Queensland.

As a result, in December 2018, Council launched a web based Emergency Dashboard to assist the community to be better informed and to provide a single source of information. The dashboard provides Council specific information but importantly, links news feeds and emergency updates from other agencies such as SES in a central location.

### **5 Conclusions and recommendations**

Thankfully disasters of the scale of the flood experienced on the Tweed in March 2017 do not occur every day. In the wake of the disaster, Council had to overcome its own flood impacts while responding to the immediate and longer term needs of the community. At times this required a rethink of the business as usual approach.

Successes came from a vast number of staff and service areas. This included minor tweaks to existing processes, temporarily morphing services to meet community needs, taking a flexible approach to resourcing, and by encouraging staff to rely on their professional judgement. Other successes came from out-of-the-box thinking that has resulted in significant changes that should provide long term improvements for future events.

While none of us can avoid the floods or natural disasters occurring, it is hoped that by sharing experiences we can ensure our communities not only recover but find new ways to thrive.