Barwon Darling Community Drought Update

Adrian Langdon,
Executive Manager, System Operations
Drought Situation Update
NSW rainfall
1 May 2017 – 30 April 2019
Maximum temperature
1 May 2018 – 30 April 2019
Northern Valley Situation
Border Rivers system inflows vs allocations

Last 10 Year Average Inflow (966 GL)

<table>
<thead>
<tr>
<th>Year</th>
<th>Volume (ML)</th>
</tr>
</thead>
<tbody>
<tr>
<td>09-10</td>
<td></td>
</tr>
<tr>
<td>10-11</td>
<td>3,500,000</td>
</tr>
<tr>
<td>11-12</td>
<td>1,200,000</td>
</tr>
<tr>
<td>12-13</td>
<td>1,000,000</td>
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<tr>
<td>13-14</td>
<td>1,000,000</td>
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<tr>
<td>14-15</td>
<td>1,000,000</td>
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<tr>
<td>15-16</td>
<td>1,000,000</td>
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<tr>
<td>16-17</td>
<td>2,000,000</td>
</tr>
<tr>
<td>17-18</td>
<td>400,000</td>
</tr>
<tr>
<td>18-19 up to 31 Dec</td>
<td>500,000</td>
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</tbody>
</table>

Legend:
- Irrigation usages
- Environmental usages
- Supplementary usages
- River flows
- Last 10-Year Average Inflow
Extractive users (GS and Supplementary) have taken 22% of total inflows over this period.

- Long Term Average Inflow (1,141 GL)
- Last 10 Year Average Inflow (713 GL)
- Last 6 Year average inflow (298 GL)

62% of long term average

26% of long term average
Allocations to extractive users (GS and Supplementary) has been 16% of total inflows over this period.

Long Term Average Inflow (870 GL)

Last 10 Year Average Inflow (689 GL)

Last 6 Year average inflow (261 GL)
Macquarie system inflows vs allocations

Allocations to extractive users has been 17% of total inflows over this period.

Combined inflows in 2017-18 was 42GL. Allocations made from 2016 floods.

Combined inflows in 2018-19 up to 10th Feb 55 GL.

74% of long term average

47% of long term average

Long term average inflow (1448 GL)

Last 10 Year average inflow (1066 GL)

Last 6 Year average inflow (690 GL)

Unallocated Inflows
Env Allocations - GS+EWA
Irrigation Allocation - GS

Balonne flows upstream of St George

- Long term average inflow (1112 GL)
- 10 Year average inflow (1666 GL)
- 6 Year average inflow (266 GL)
Barwon-Darling Flows versus Extractions

Extractive users have taken 12% of total inflows over this period
Rainfall Burrendong Catchment

Burrendong Catchment Rainfall (Hills End)

Last Major Inflow Event
Rainfall Keepit Catchment
<table>
<thead>
<tr>
<th></th>
<th>12 Month</th>
<th>24 Month</th>
<th>30 Month</th>
<th>36 Month</th>
<th>48 Month</th>
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<tbody>
<tr>
<td><strong>Burrendong Dam Inflows</strong></td>
<td></td>
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<tr>
<td>Current</td>
<td>59</td>
<td>99</td>
<td>246</td>
<td>2,192</td>
<td>2,381</td>
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<tr>
<td>Previous</td>
<td>17</td>
<td>258</td>
<td>366</td>
<td>515</td>
<td>648</td>
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<tr>
<td>99thile</td>
<td>39</td>
<td>304</td>
<td>428</td>
<td>566</td>
<td>981</td>
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<tr>
<td><strong>Keepit Dam Inflows</strong></td>
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<td></td>
<td></td>
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<tr>
<td>Current</td>
<td>10</td>
<td>67</td>
<td>148</td>
<td>628</td>
<td>707</td>
</tr>
<tr>
<td>Previous</td>
<td>13</td>
<td>68</td>
<td>130</td>
<td>169</td>
<td>251</td>
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<tr>
<td>99thile</td>
<td>17</td>
<td>98</td>
<td>160</td>
<td>216</td>
<td>339</td>
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<tr>
<td><strong>Copetton Dam Inflows</strong></td>
<td></td>
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<td></td>
<td></td>
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<tr>
<td>Current</td>
<td>26</td>
<td>257</td>
<td>833</td>
<td>889</td>
<td>1,004</td>
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<tr>
<td>Previous</td>
<td>9</td>
<td>53</td>
<td>114</td>
<td>218</td>
<td>301</td>
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<td>1919</td>
<td>1920</td>
<td>1920</td>
<td>1995</td>
<td>1995</td>
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<td>99thile</td>
<td>22</td>
<td>94</td>
<td>200</td>
<td>253</td>
<td>395</td>
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</table>
An additional 260,000ML is required prior to making any new AWD.
Current Resources Breakdown
Gwydir April 2019

Resource Distribution as at 30 April 2019
Gwydir Valley

- Essential Supplies 67 GL
- ECA 41 GL
- Total General Security Account Balance 24 GL
- e-water (22 GL)
- Irrigator (2 GL)
- Delivery Losses 0 GL
- Storage Losses 18 GL

Total = 150 GL
* indicative breakdown of held environmental water holdings (OEH, CEWH), refer to note 4.

Supply Source

- Delivery Loss Shortfall 19.6 GL
- Copeton Dam 150 GL
- ES Shortfall 27.8 GL
Drought Outlook
ENSO Outlook

An alert system for the El Niño–Southern Oscillation

Issued 14 May 2019  Next issue 28 May 2019

ENSO Outlook

ENSO Outlook eases back to El Niño WATCH

The ENSO Outlook has been eased to El Niño WATCH. This means the chance of El Niño forming in 2019 is around 50%, still double the normal likelihood.

Sea surface temperatures in the tropical Pacific have hovered around the El Niño threshold since late February but there are signs the warm anomalies may soon ease. The atmosphere has generally remained ENSO neutral. Most models indicate the tropical Pacific will remain at or above the El Niño threshold heading into winter, before cooling in late winter and spring. By October, five of eight models indicate a neutral ENSO state is most likely.

El Niño WATCH is not a guarantee that El Niño will occur; it is an indication that some of the typical precursors of an event are in place.

Further information on the current status of ENSO can be found in the ENSO Wrap-Up.

Details: ENSO Wrap-Up

WaterNSW
How Critical are Dam Levels?
- Burrendong Dam: 6.0% capacity; 105 GL volume. Burrendong Dam is expected to drop steadily to about 5% by end of the water year

Record low in-flows
- There have been inflows of about 48,900 ML into Burrendong Dam since 1 January 2019. The combination of Windamere releases and Burrendong inflows has resulted in Burrendong Dam being higher than previously forecast for this stage of the drought planning.
- If conditions remain dry, a second phase of the transfer will occur in late 2019, leaving a minimum of 70GL in Windamere Dam, which provides a very secure supply for local demand for the next five to seven years.
- Comparatively, the worst two years of the prior drought of record (June 1979 – May 1981) has a total inflow 258GL. Compared May 2017 – end of April 2019, 99GL =38% of previous drought of record.

WaterNSW Management and Mitigation Measures

- Operate river up to Warren
- Limited supply to LWU, S&D, HS and mines;
- No supply to GS & EWA.

- Bulk water transfer from Windamere Dam to Burrendong Dam

- Start pumping from Burrendong – deep storage level

- Unable to deliver full TWS entitlements

- Cease to flow – range – depending on conditions

1 Jul 2019

1 Dec 2019

1 Mar 2020

20 May – 1 July 2020
Macquarie Storage Depletion Curve

Based on End of March RA

- IRG-Stage 4 operation
- Nil access to GS and EWA from 1st of July 2019
- Operate river up to Warren
- 10% AWD for regulated HS
- 50% AWD for S&D users
- 70% AWD for LWU users
- 31 GL bulk water transfer
- 35 GL dead storage and assume 300 ML/day delivery
- 6 GL left for water quality issues and fish reserve
Gwydir Storage Depletion Curve
Based on End of March RA

Gwydir Valley forecast storage volume

1st of July 2019
- Nil access to GS
- 100% HS AWD
- 100% remaining GS, Env delivery (26 GL)
- Around 73% remaining delivery of ECA (32 GL)

1st of April 2021
- Cease to flow

Dead Storage: 19 GL

Storage capacity (GL)

<table>
<thead>
<tr>
<th>Date</th>
<th>Drought of Record</th>
<th>Zero Inflow</th>
<th>Actual</th>
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<tbody>
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<td>Jul-18</td>
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<td>Mar-21</td>
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What are we doing now?
Warrego Flows

Barringun – 50,733 ML
Fords Bridge – 25,478 ML
Dicks Dam – 17,576 ML
Louth – 14,167 ML
Tilpa – 8,875 ML
Warrego Flows entering the Darling

Warrego Flows
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