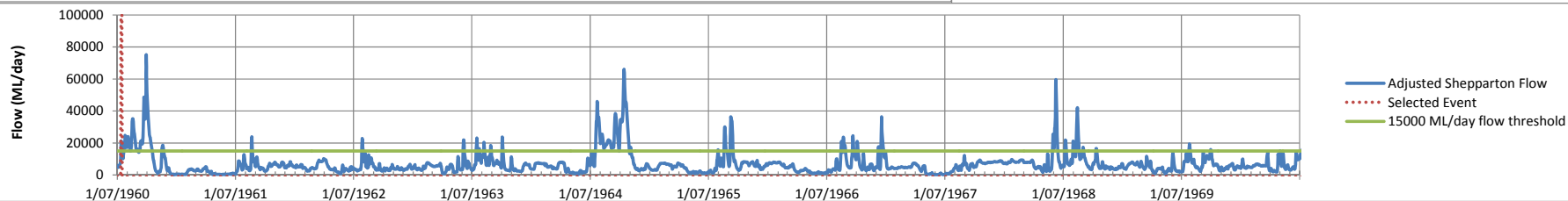
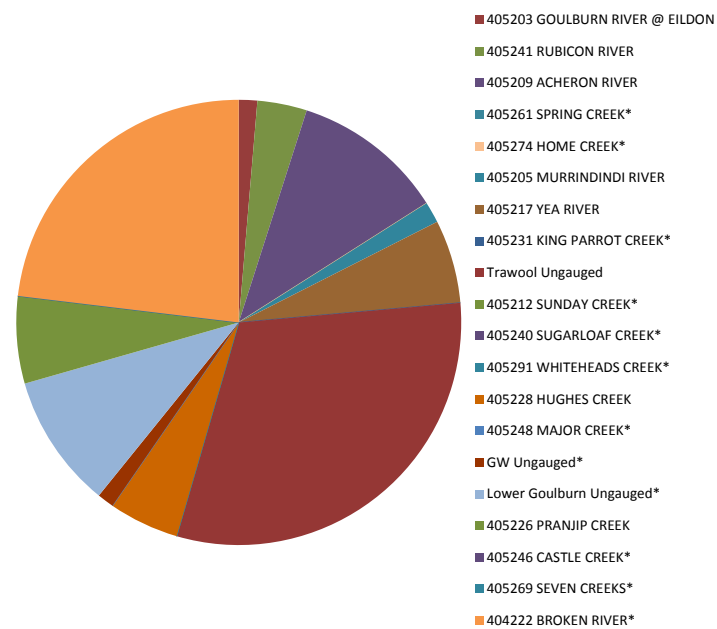
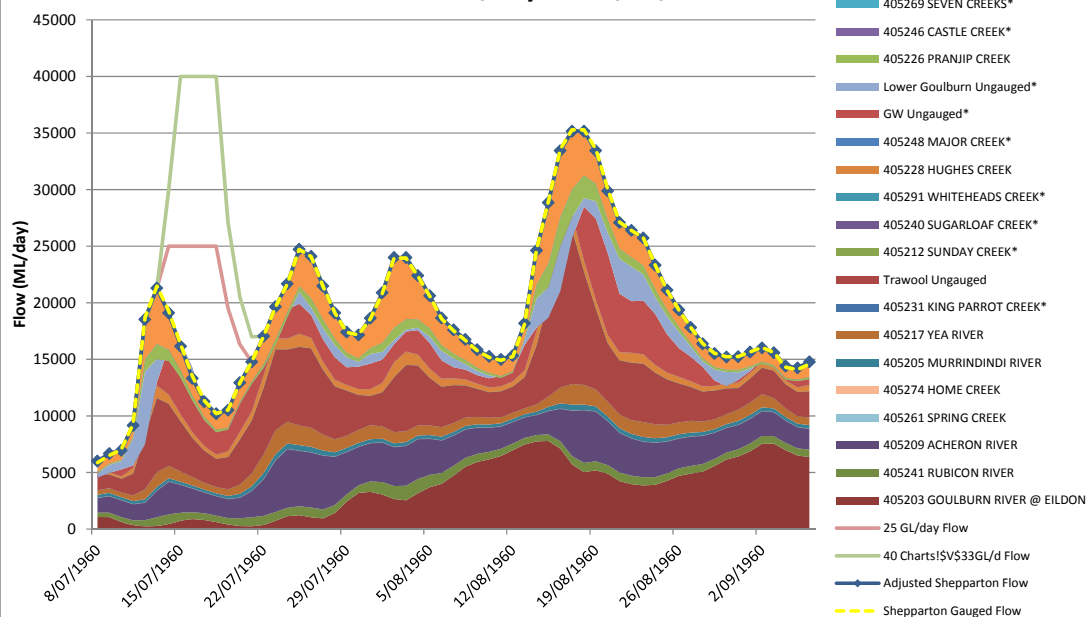
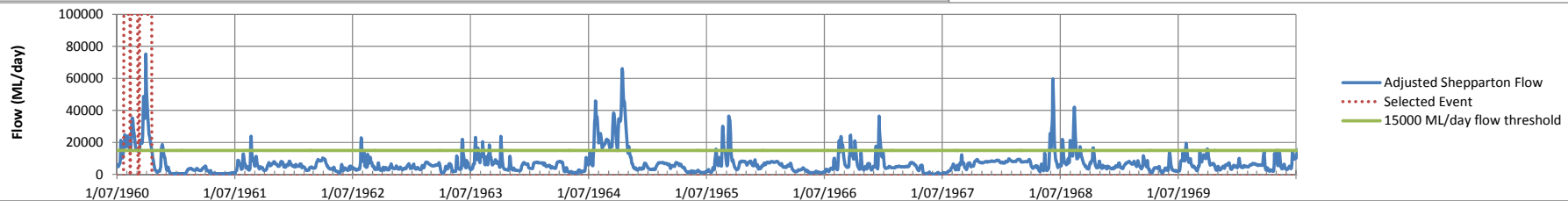
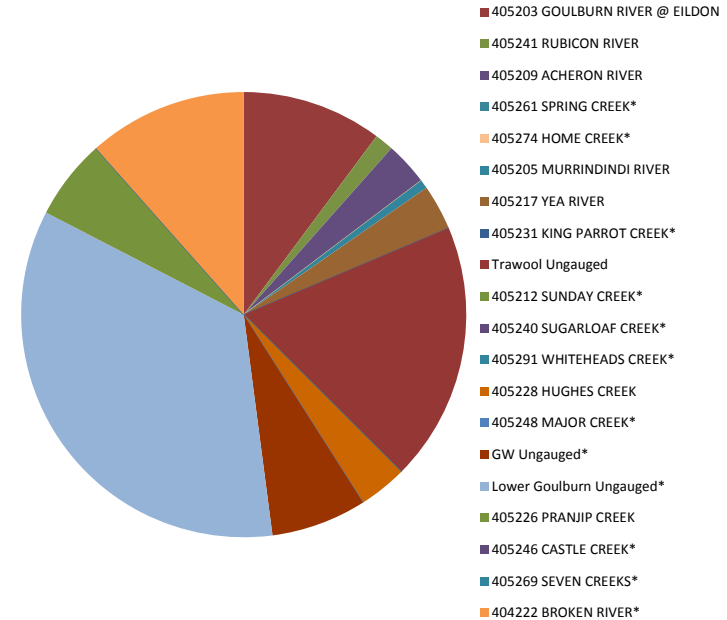
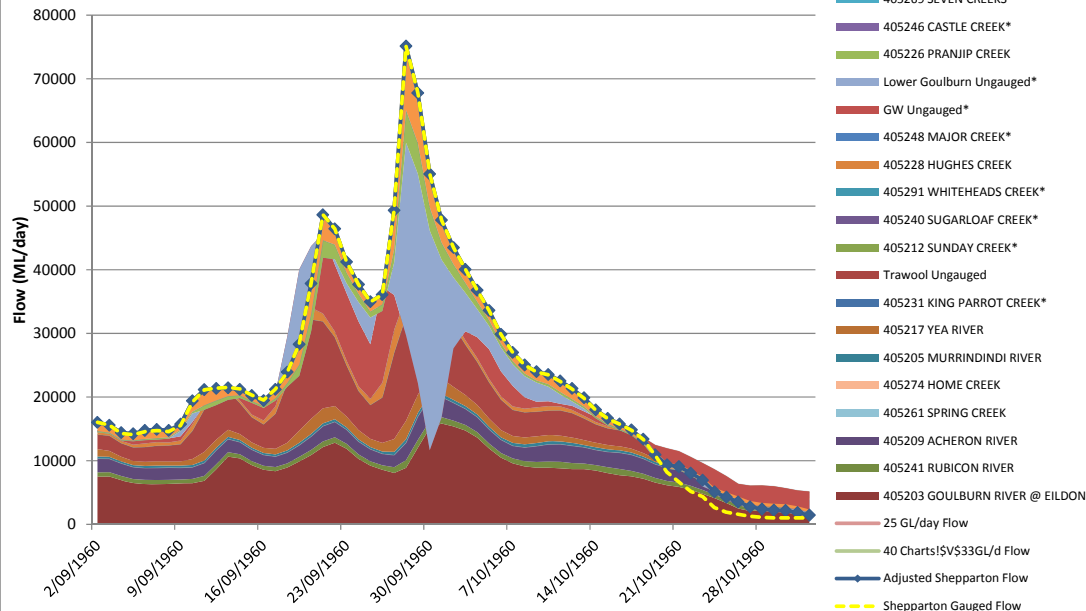


Appendix A. Event Plots

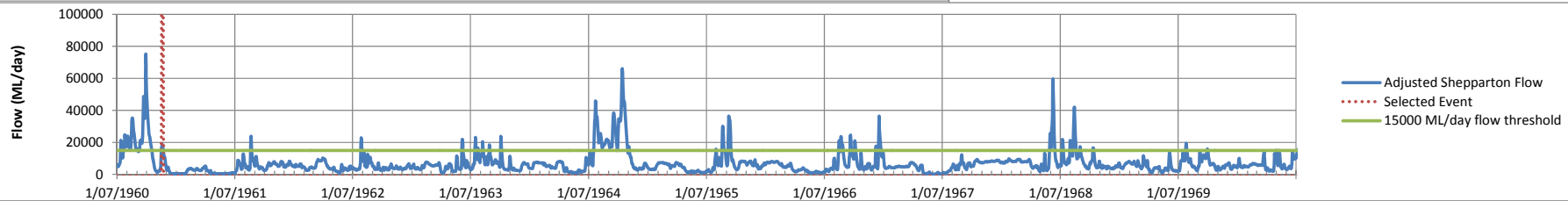
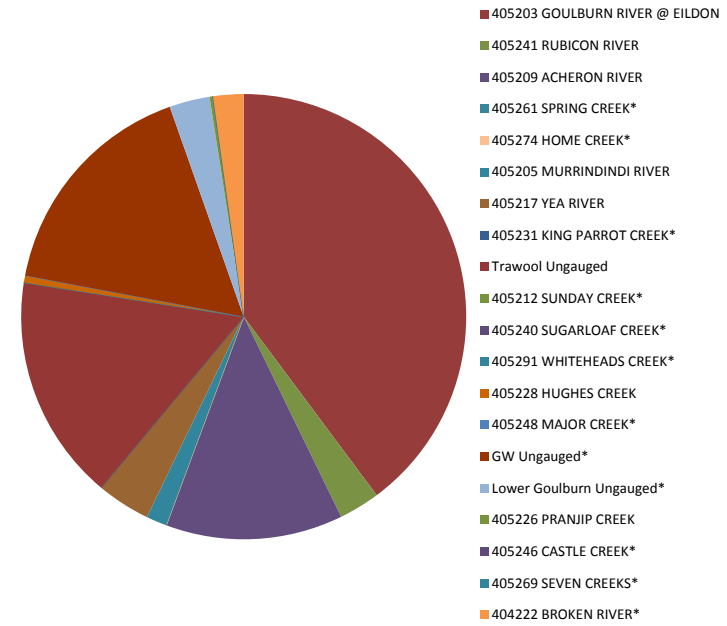
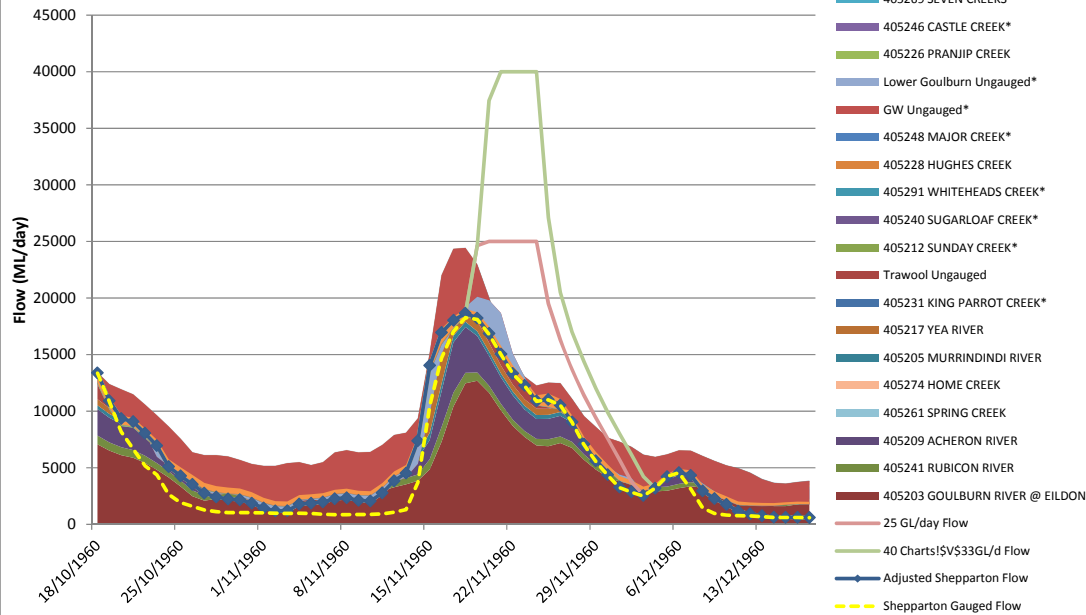
Event 1 - Peak Flow of 21293ML/day on 13/07/1960



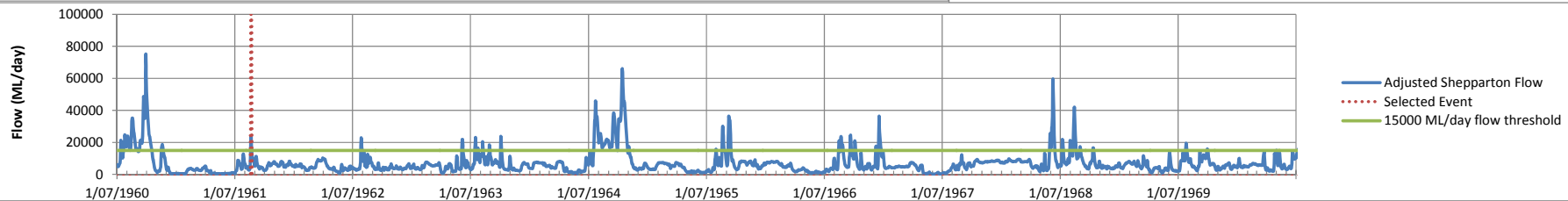
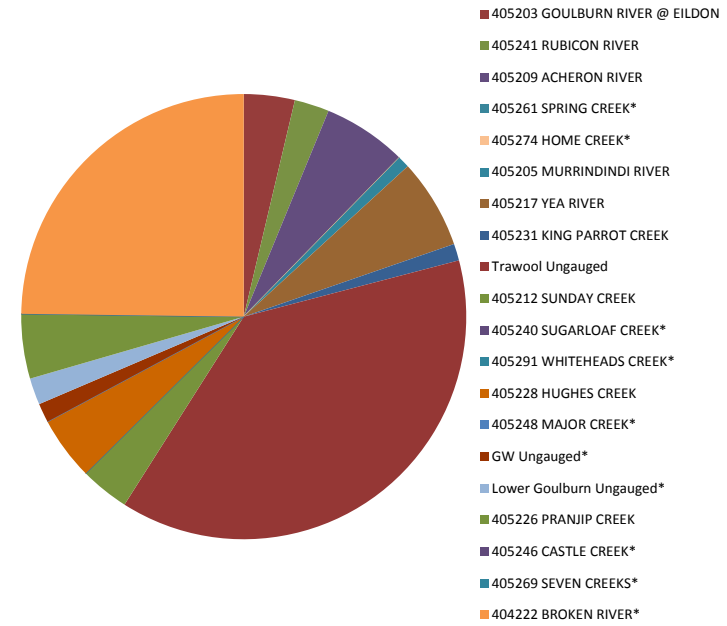
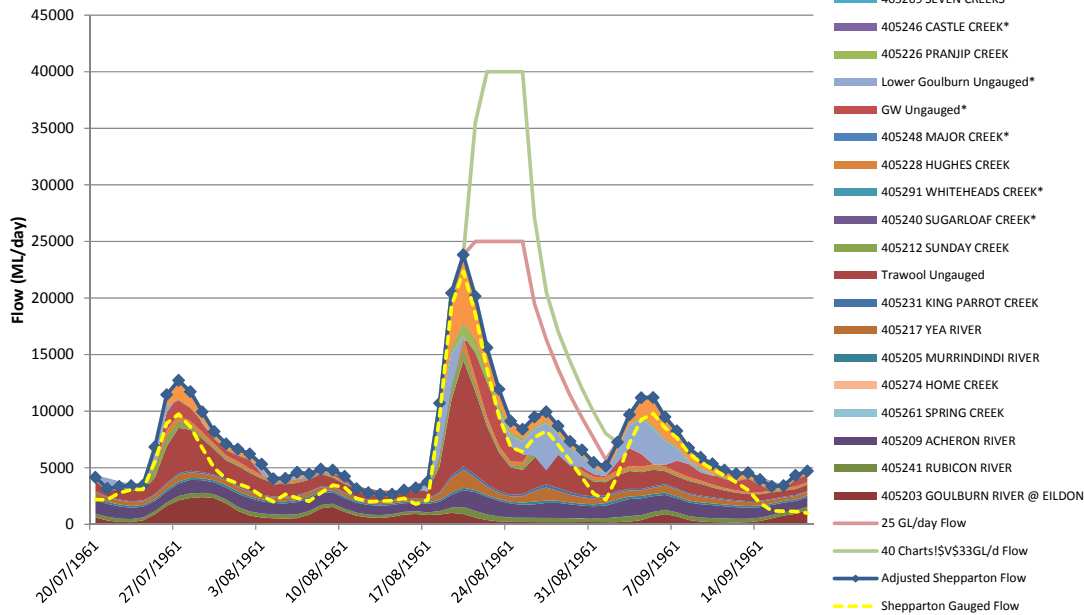
Event 2 - Peak Flow of 75117ML/day on 28/09/1960



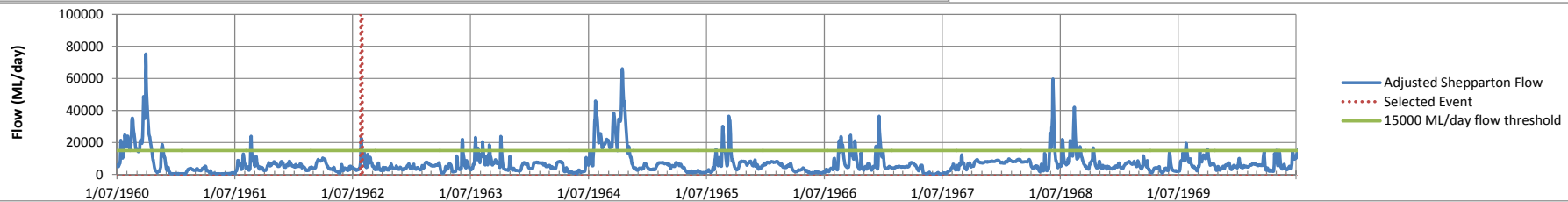
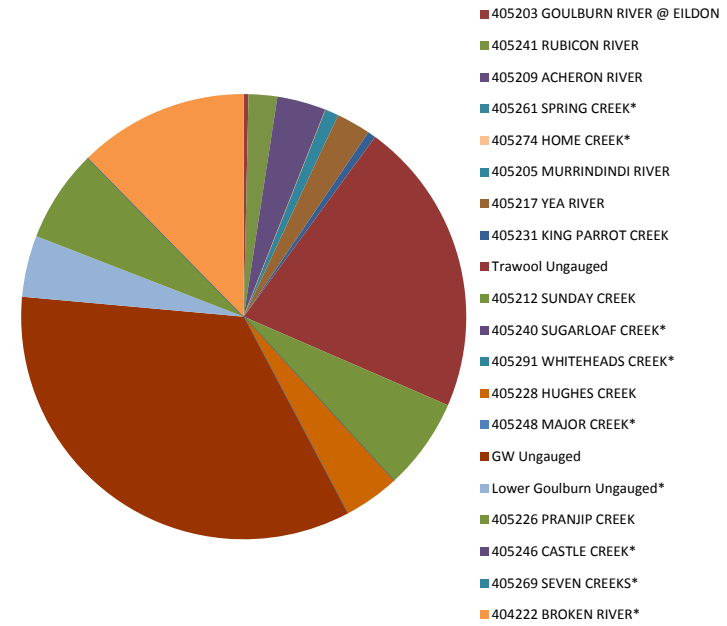
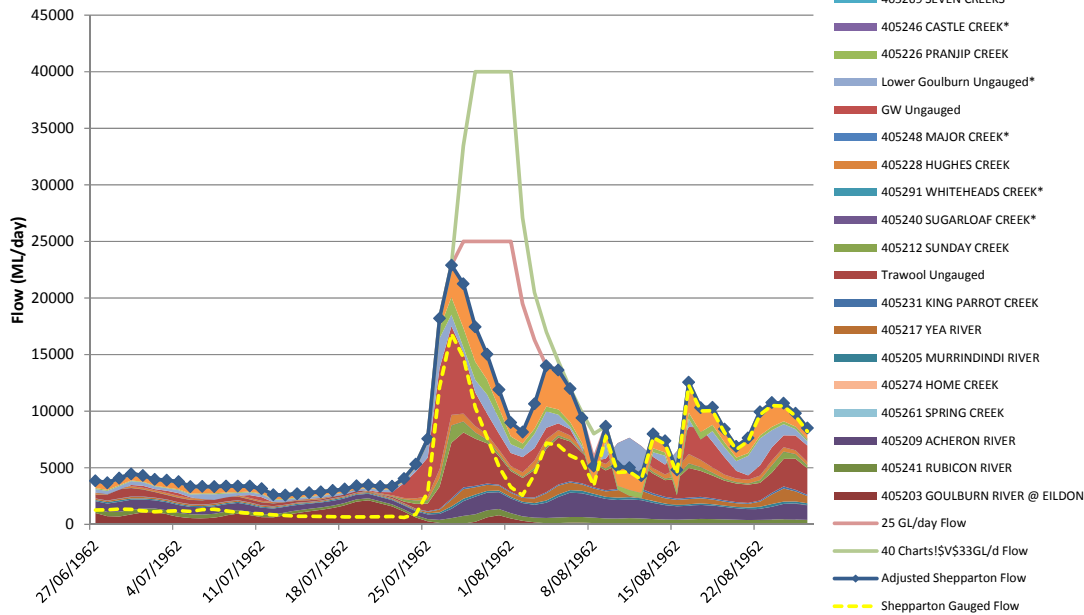
Event 3 - Peak Flow of 18658ML/day on 18/11/1960



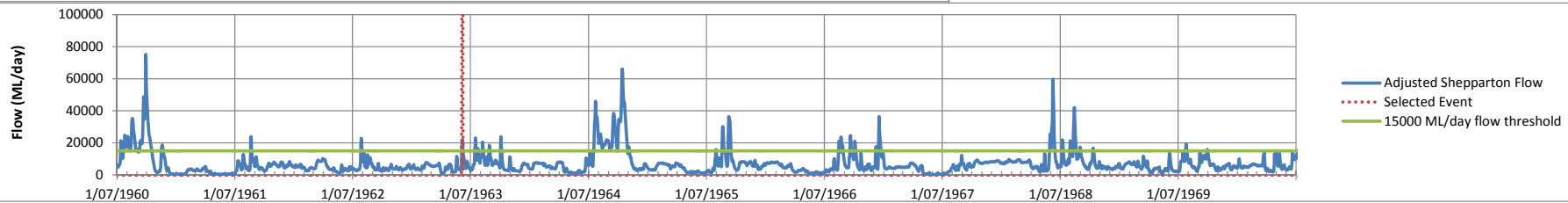
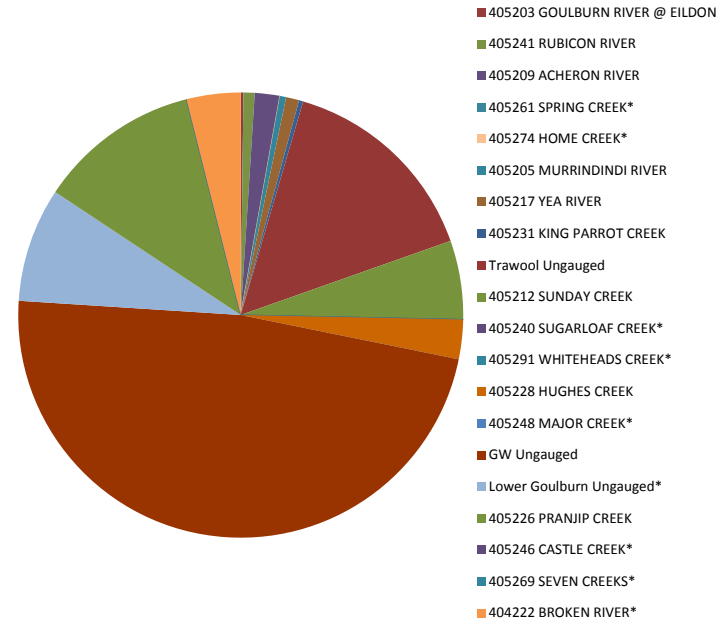
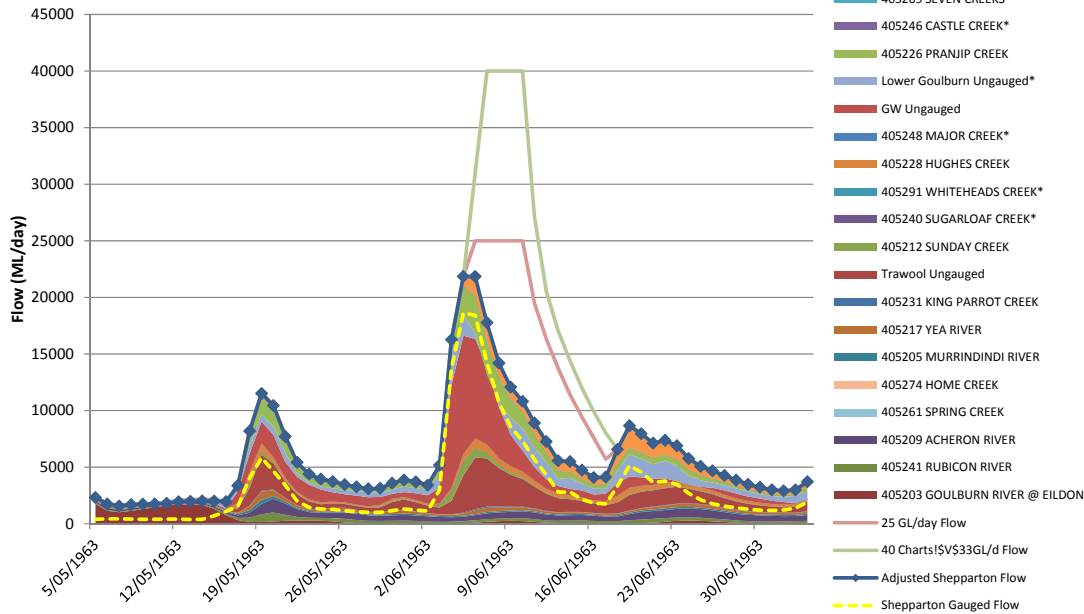
Event 4 - Peak Flow of 23810ML/day on 20/08/1961

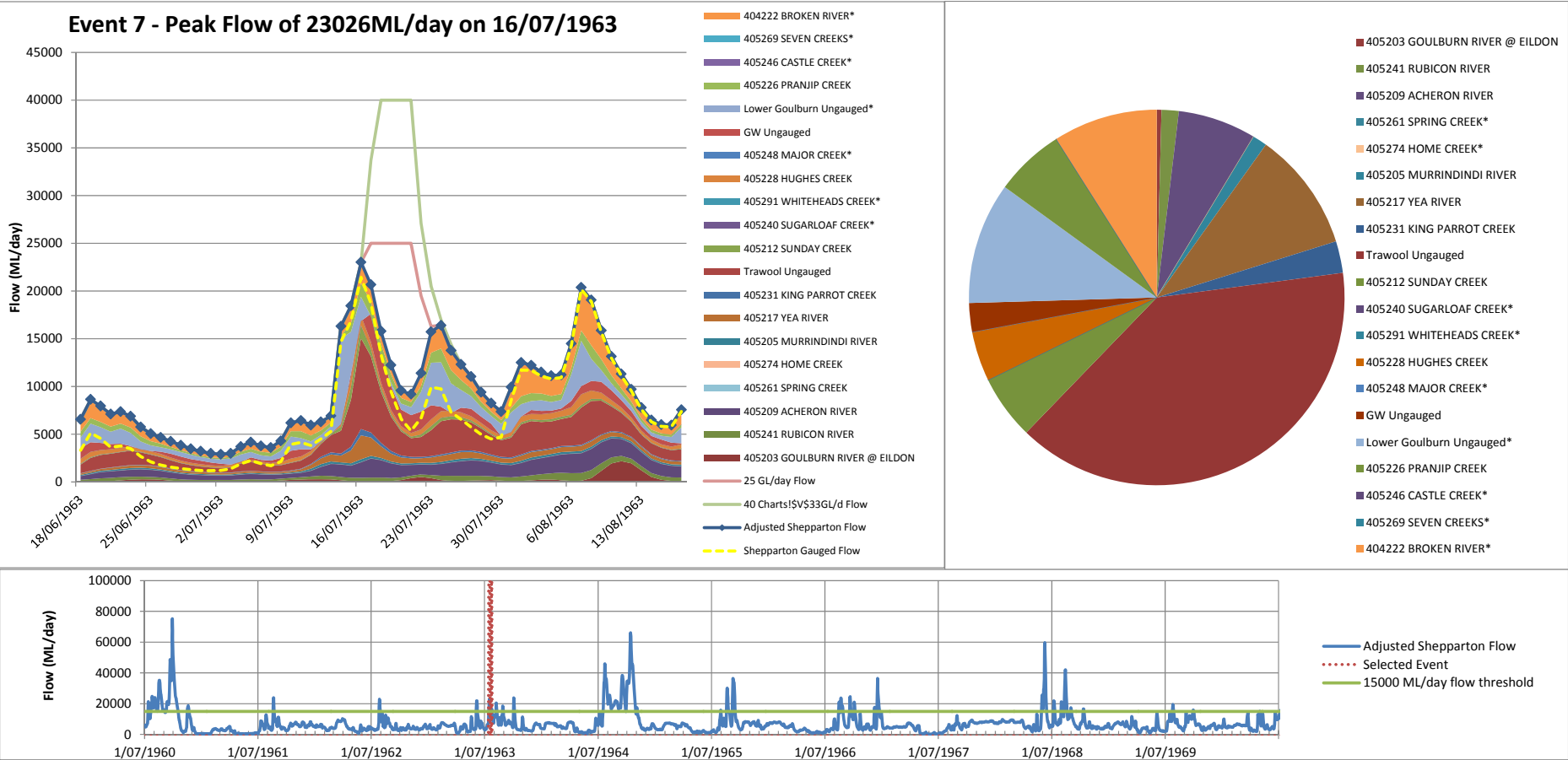


Event 5 - Peak Flow of 22910ML/day on 27/07/1962

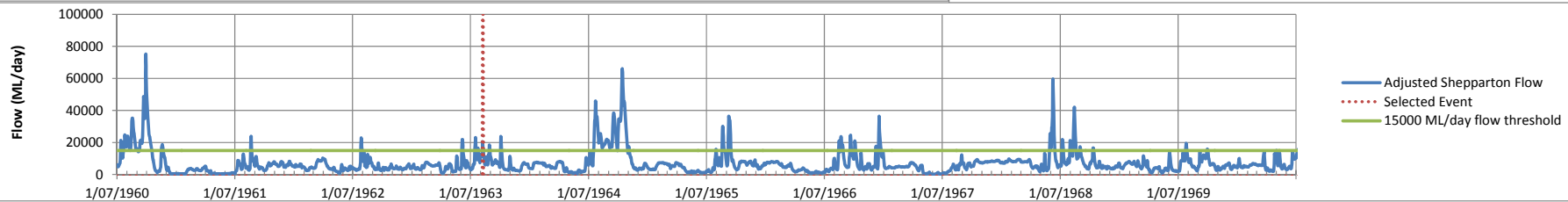
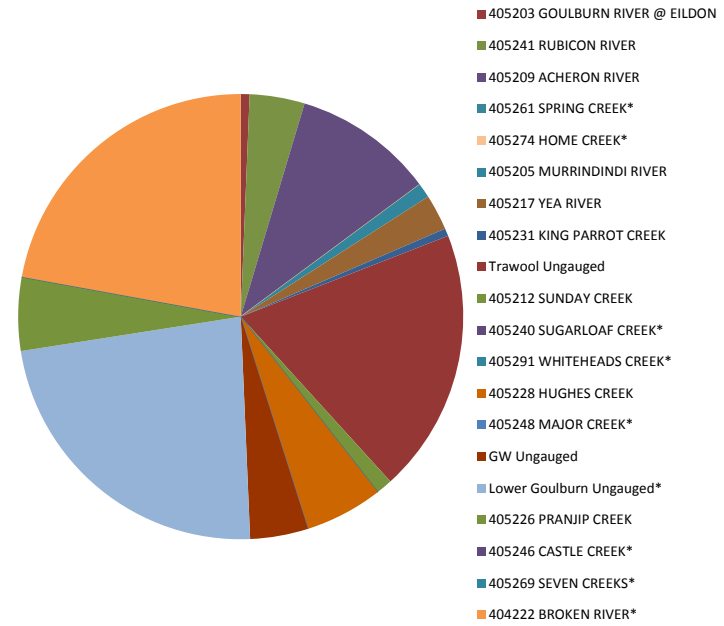
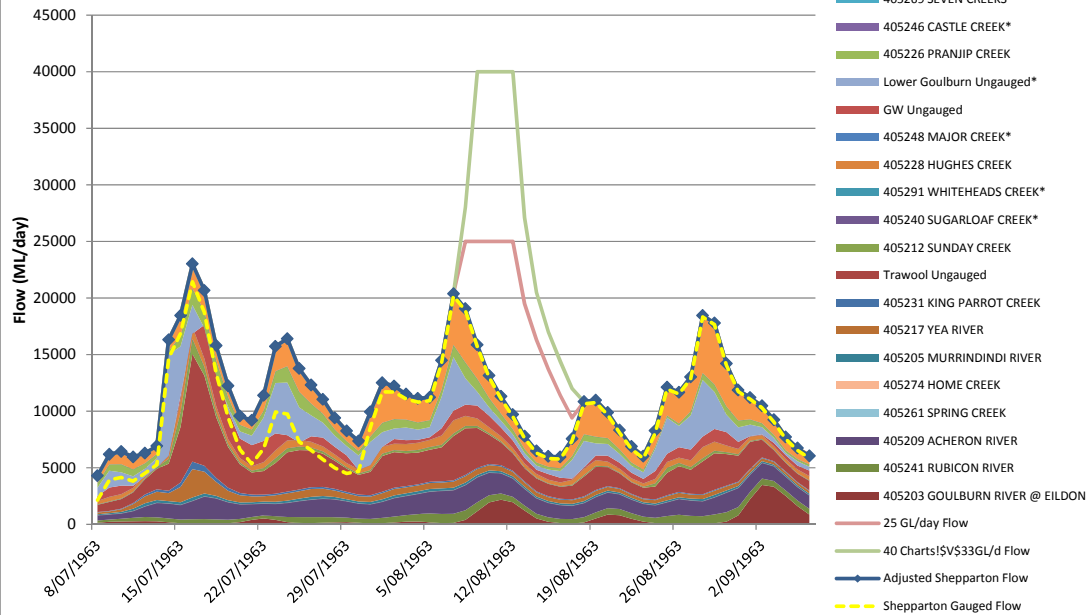


Event 6 - Peak Flow of 21854ML/day on 05/06/1963

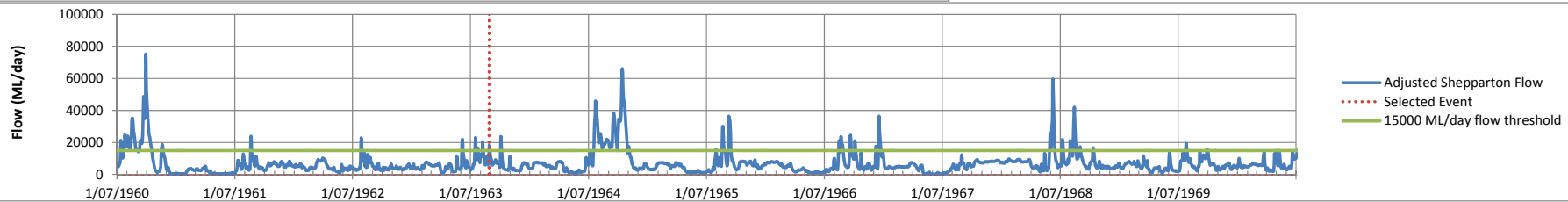
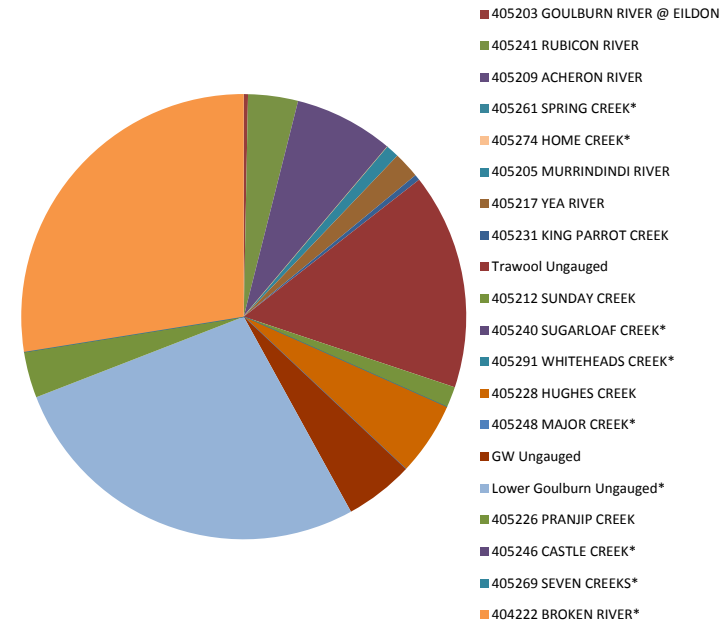
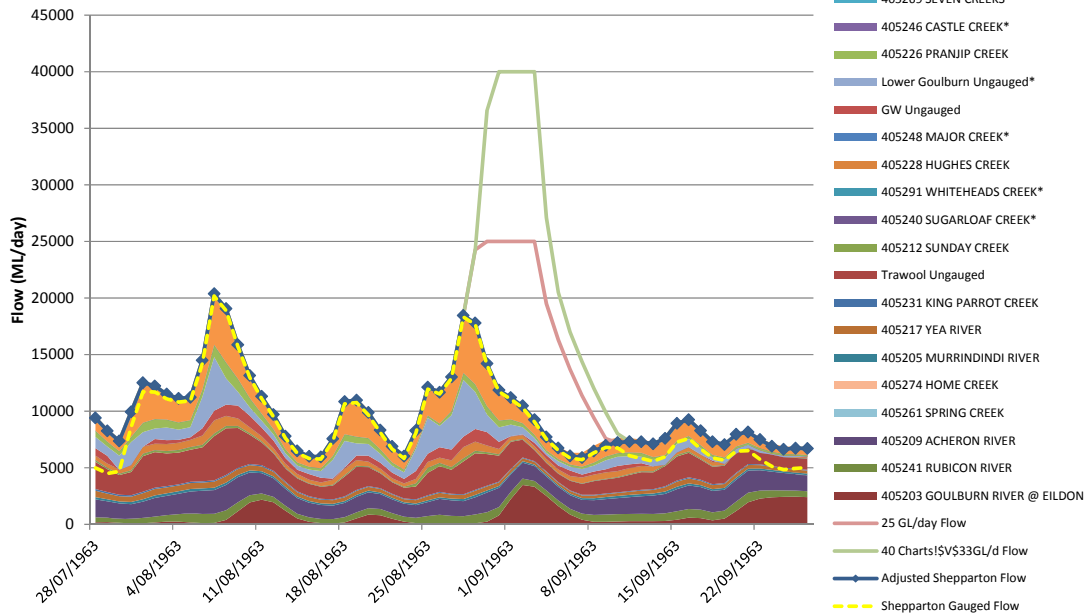




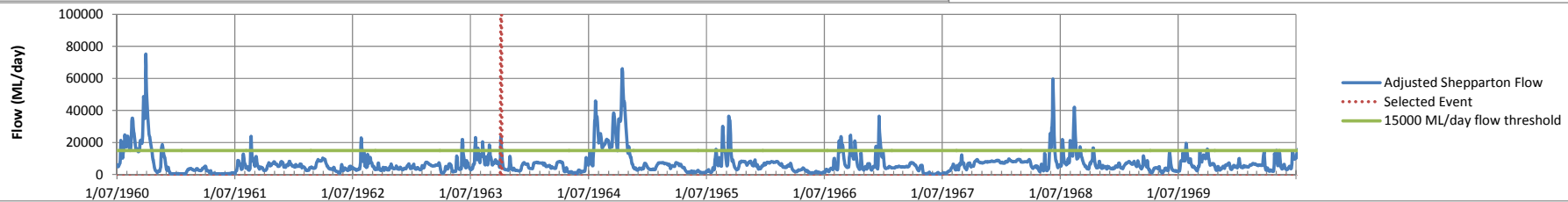
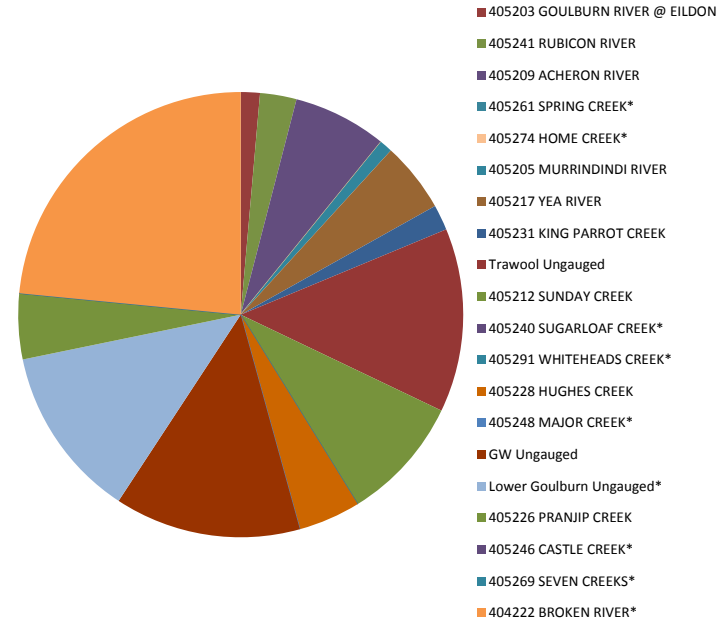
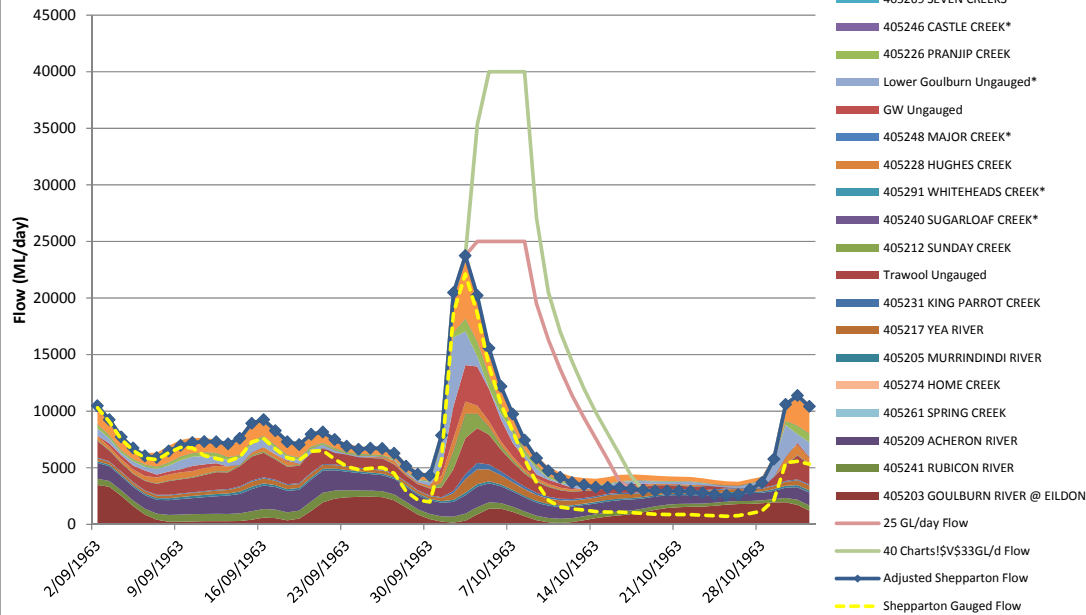
Event 8 - Peak Flow of 20380ML/day on 07/08/1963



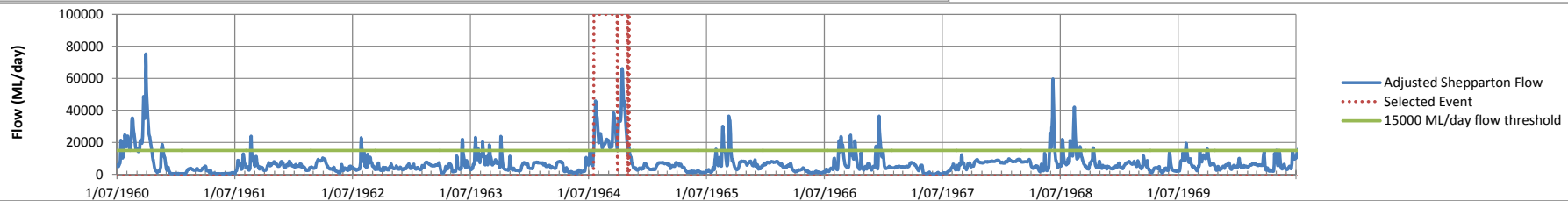
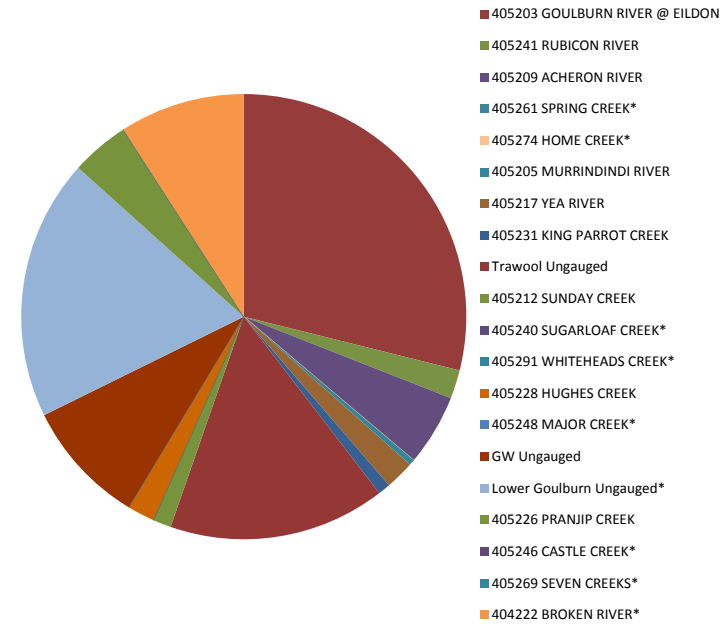
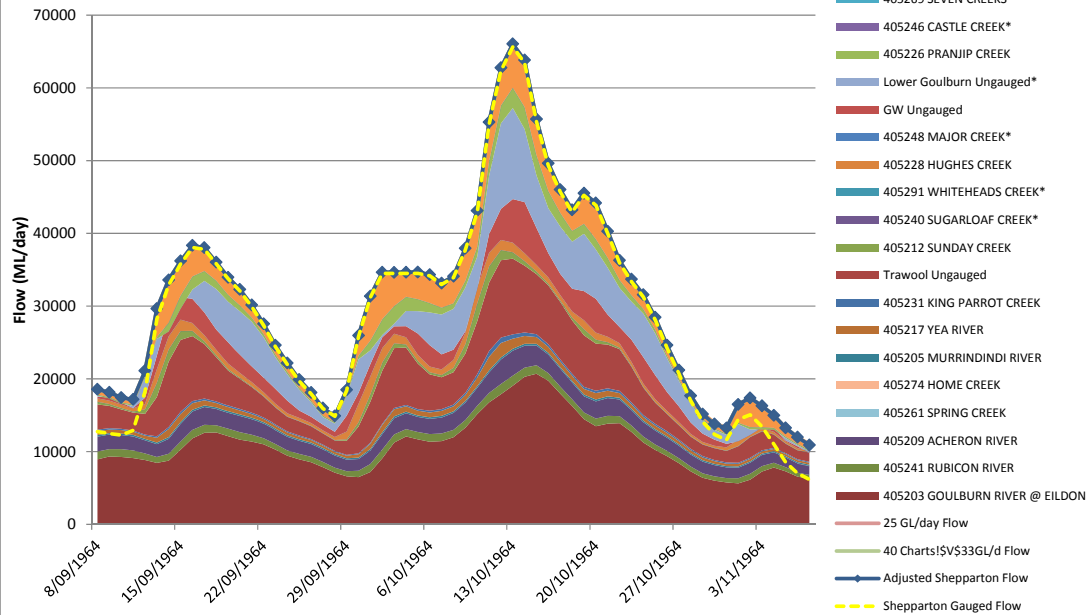
Event 9 - Peak Flow of 18462ML/day on 28/08/1963



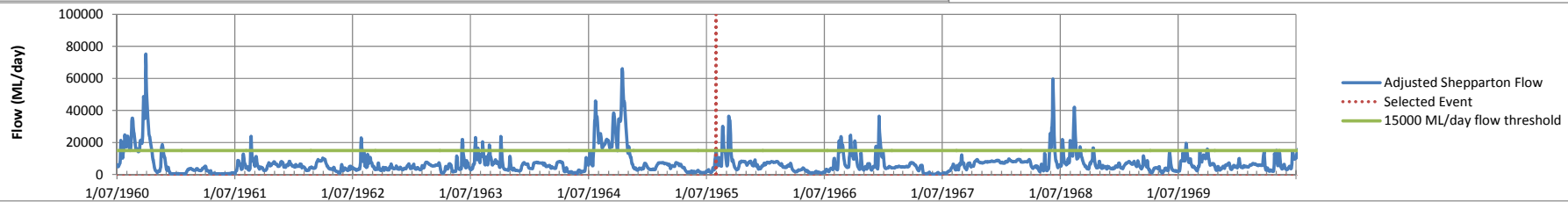
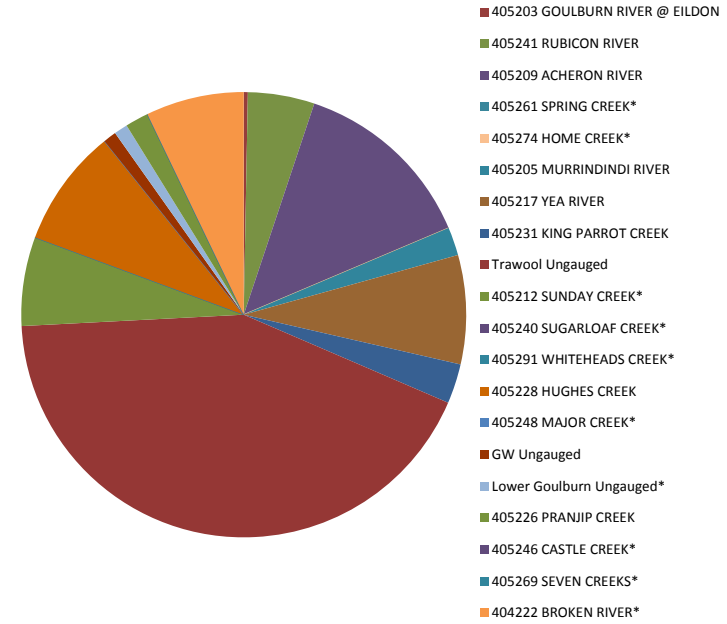
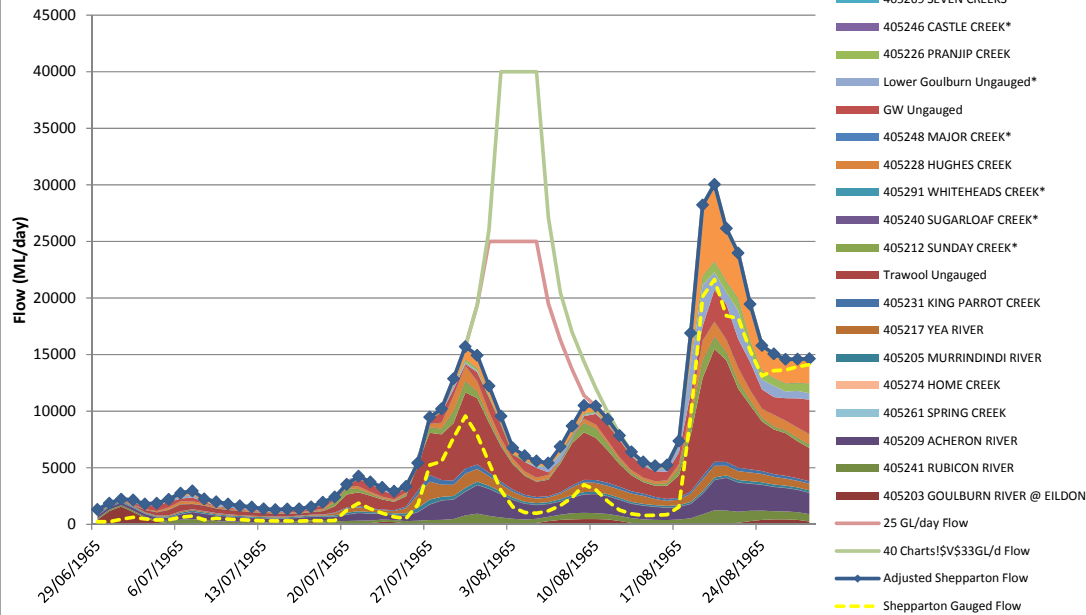
Event 10 - Peak Flow of 23743ML/day on 03/10/1963



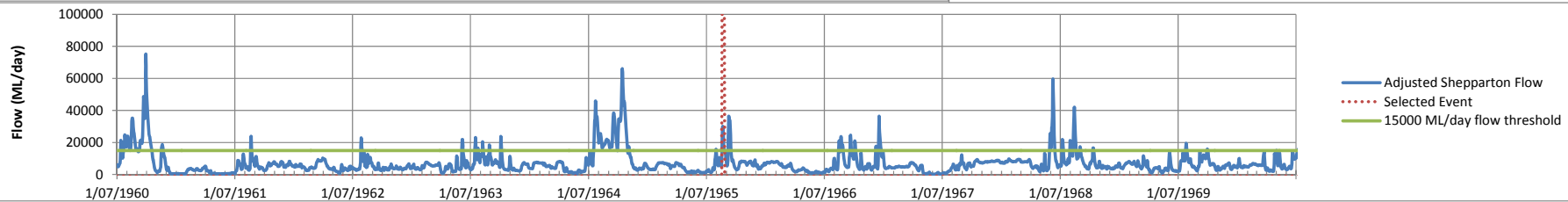
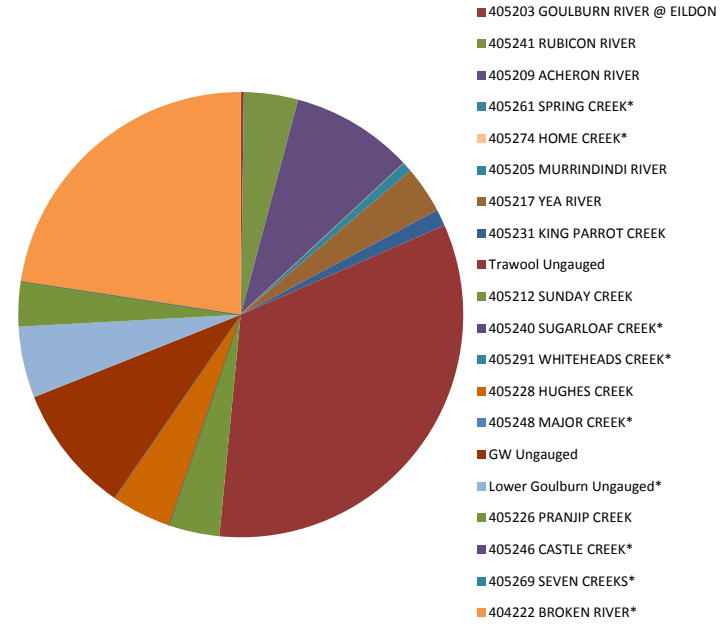
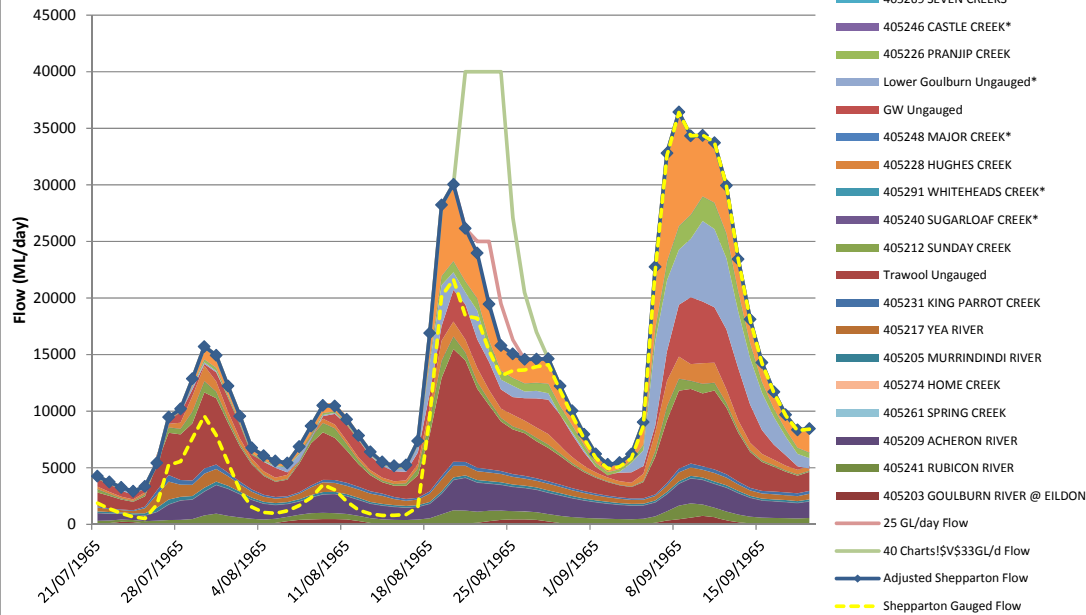
Event 11 - Peak Flow of 66023ML/day on 13/10/1964



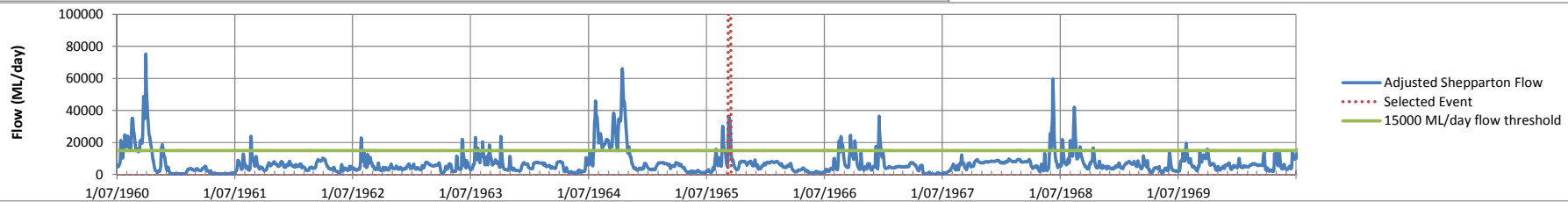
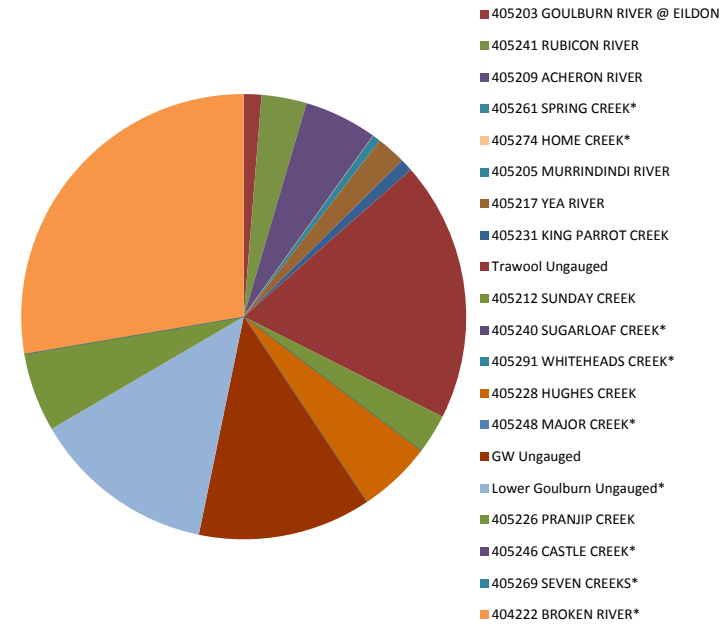
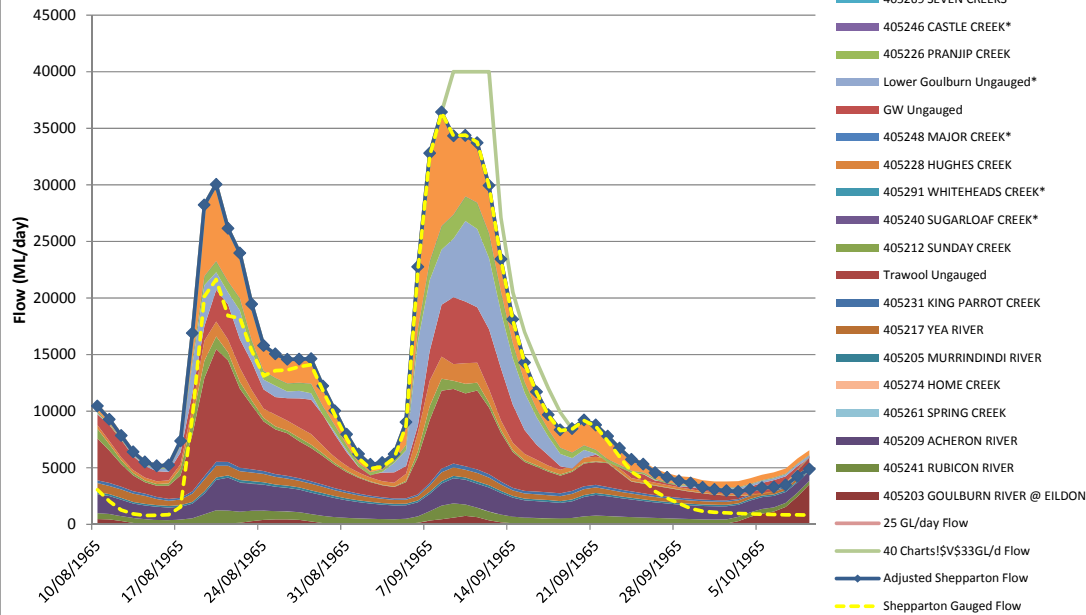
Event 12 - Peak Flow of 15712ML/day on 30/07/1965



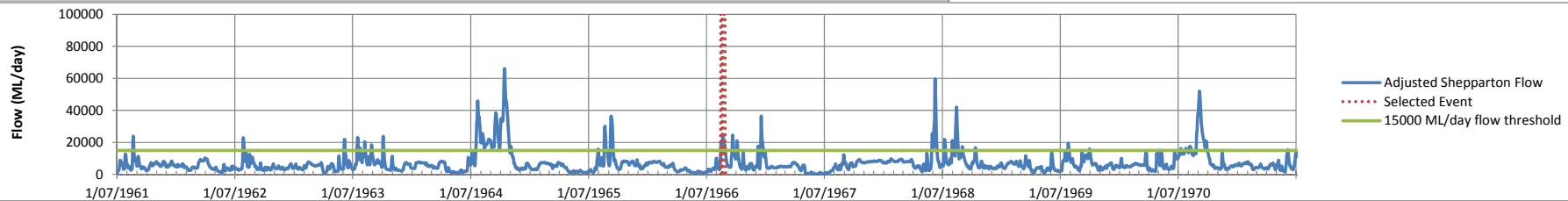
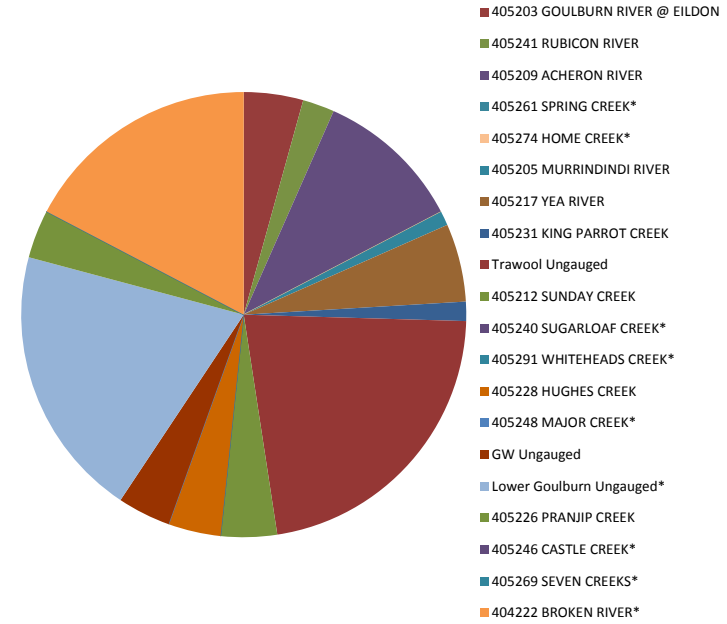
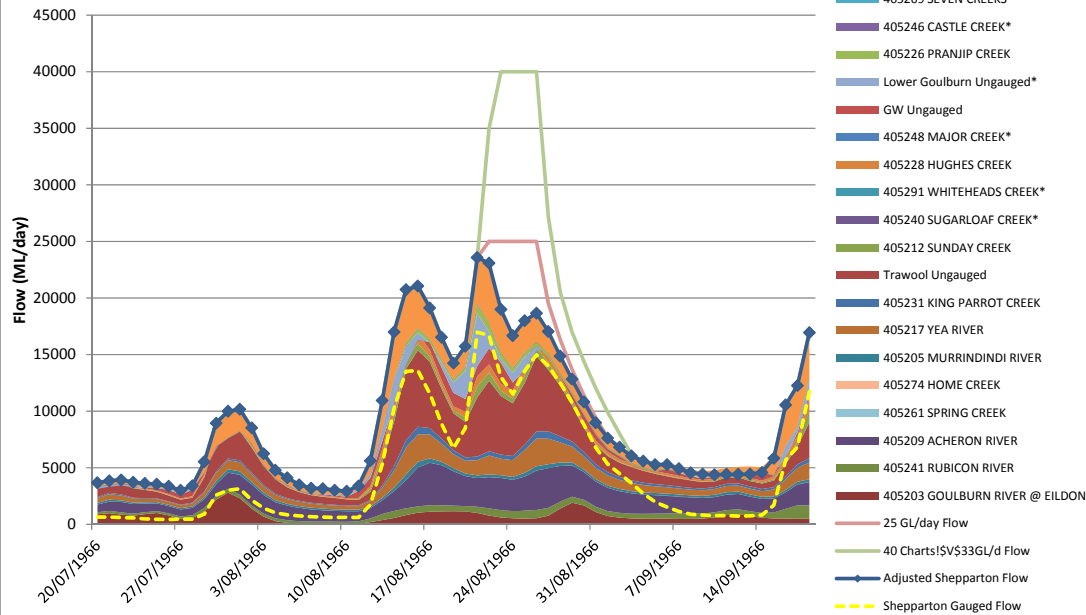
Event 13 - Peak Flow of 30047ML/day on 20/08/1965

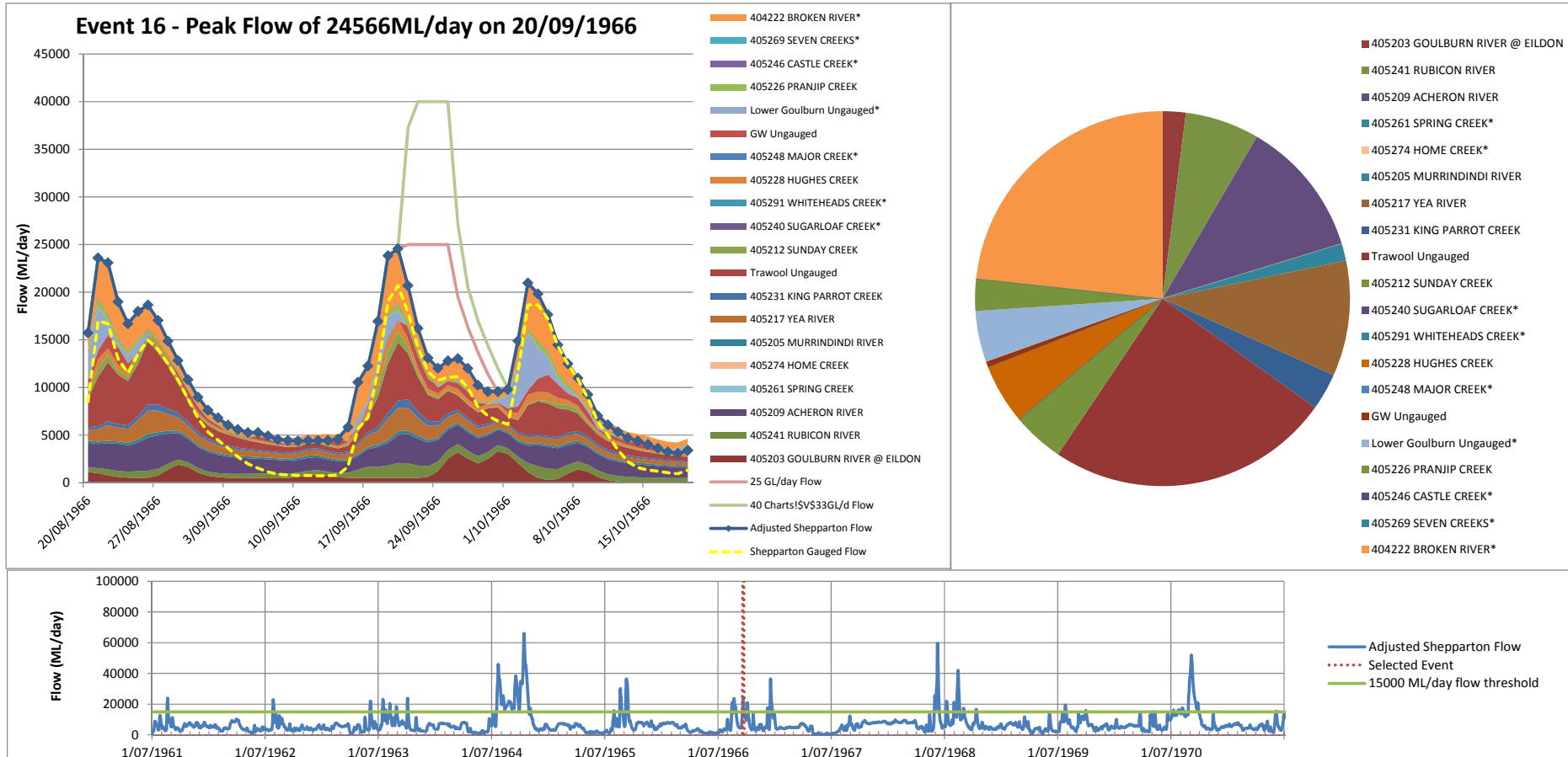


Event 14 - Peak Flow of 36432ML/day on 08/09/1965

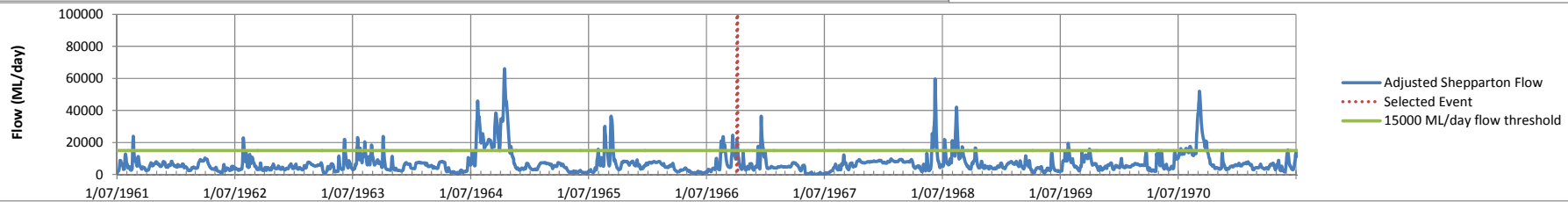
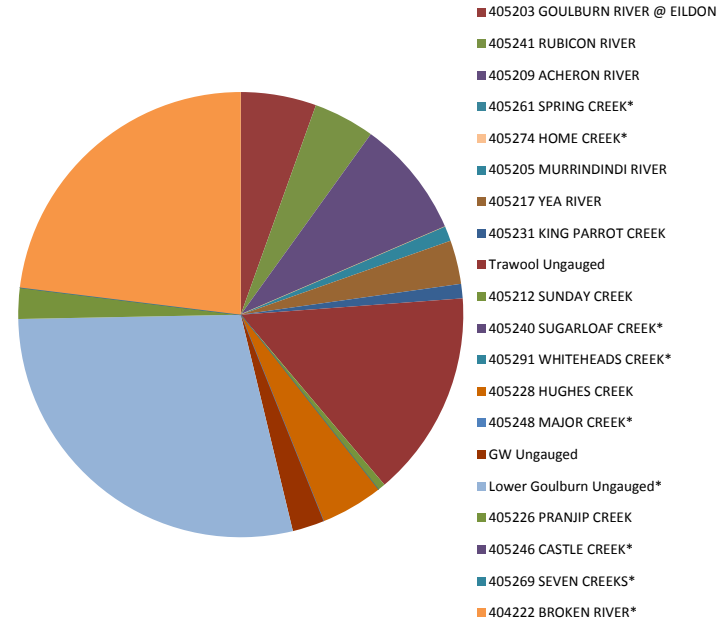
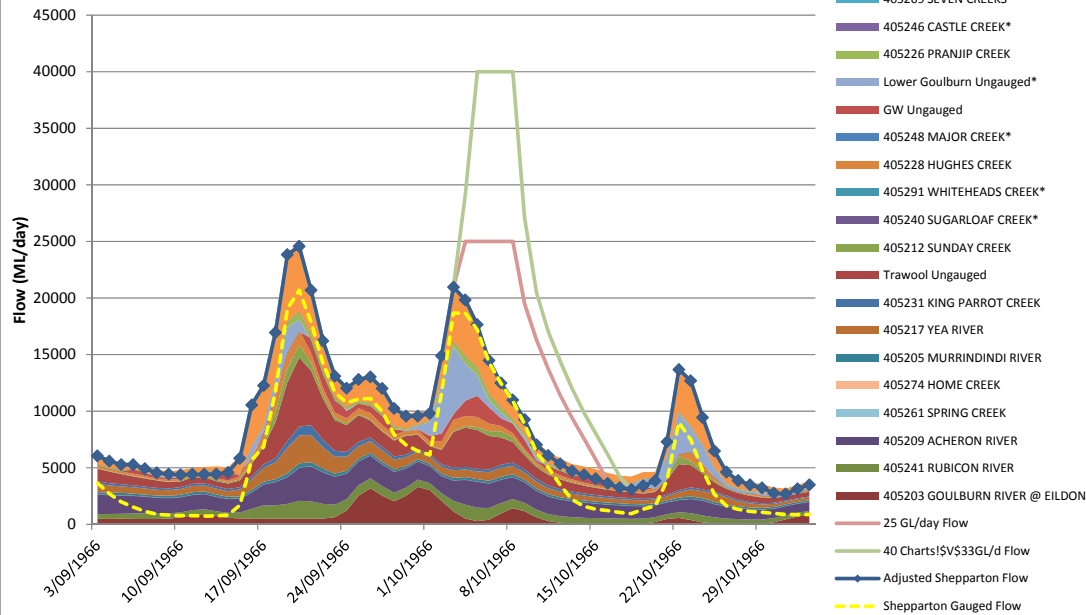


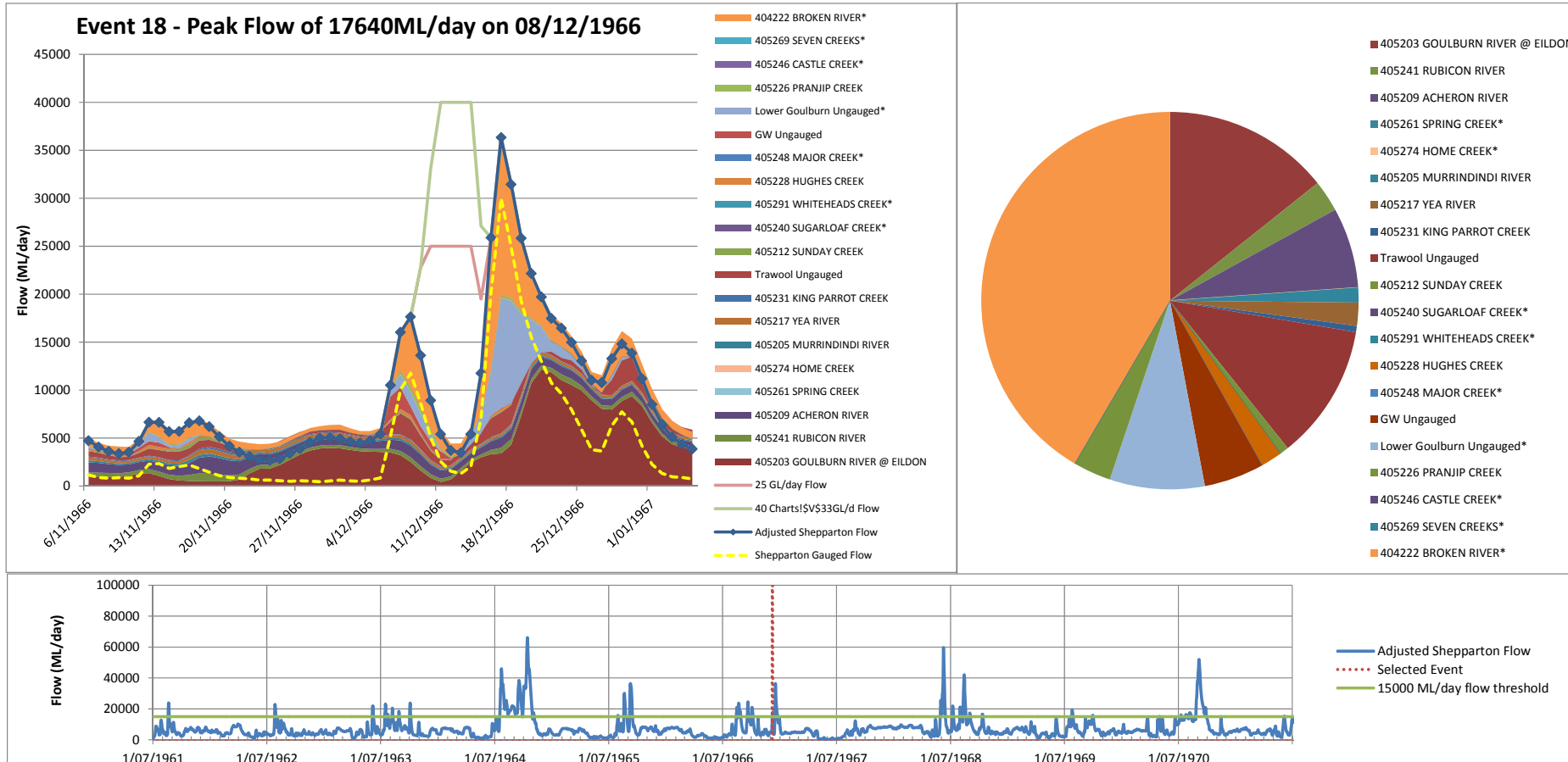
Event 15 - Peak Flow of 23588ML/day on 21/08/1966

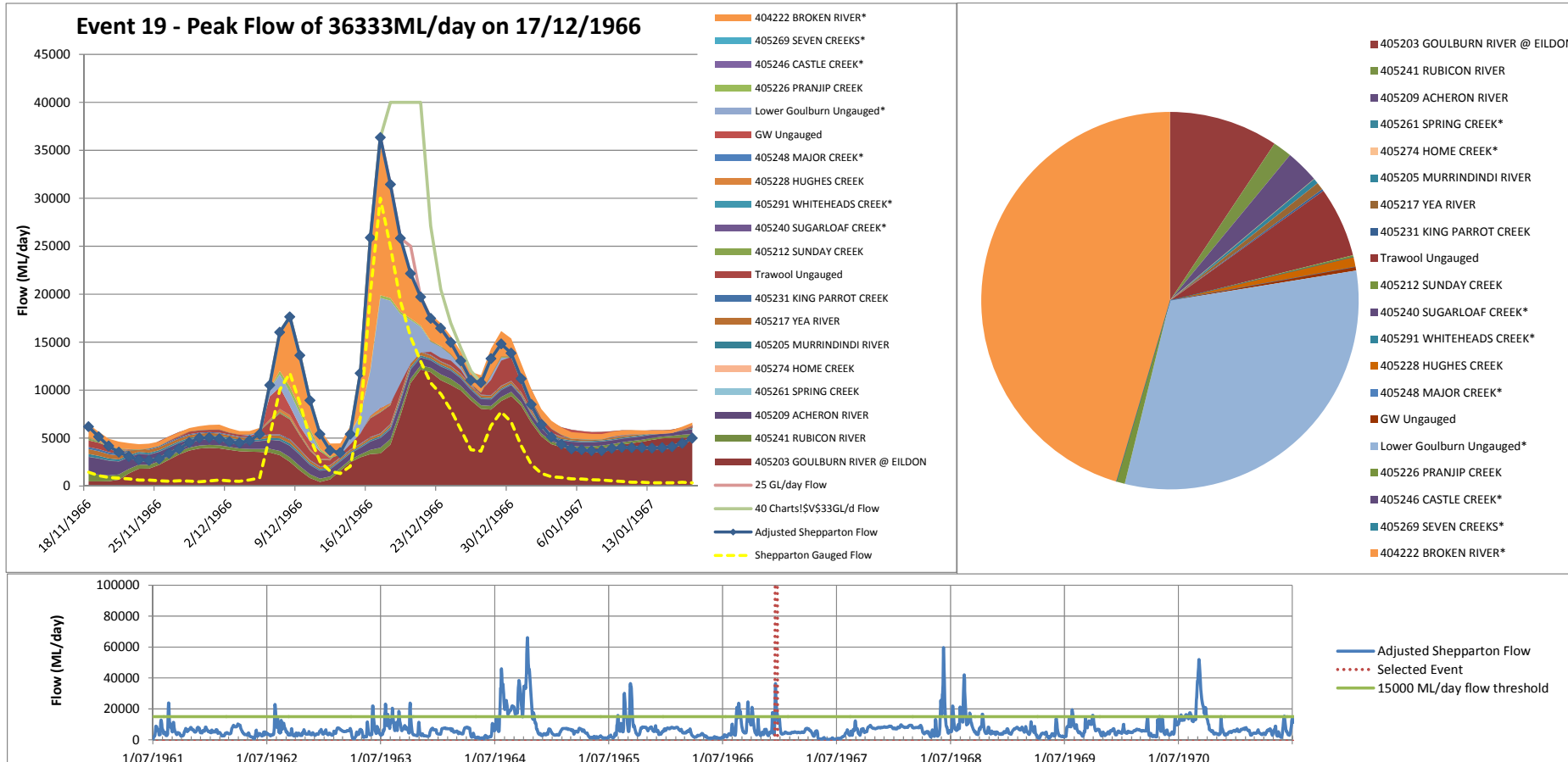


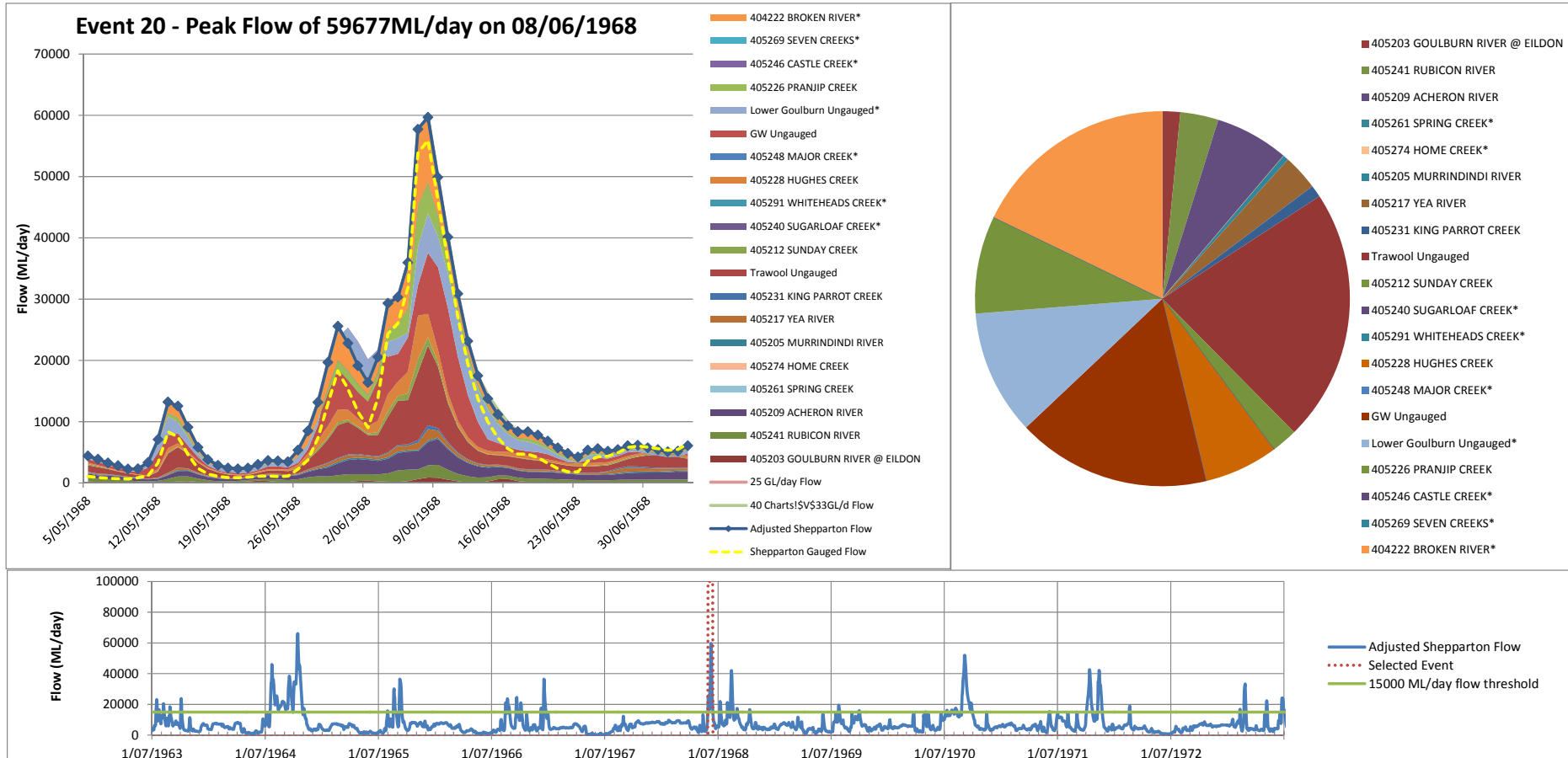


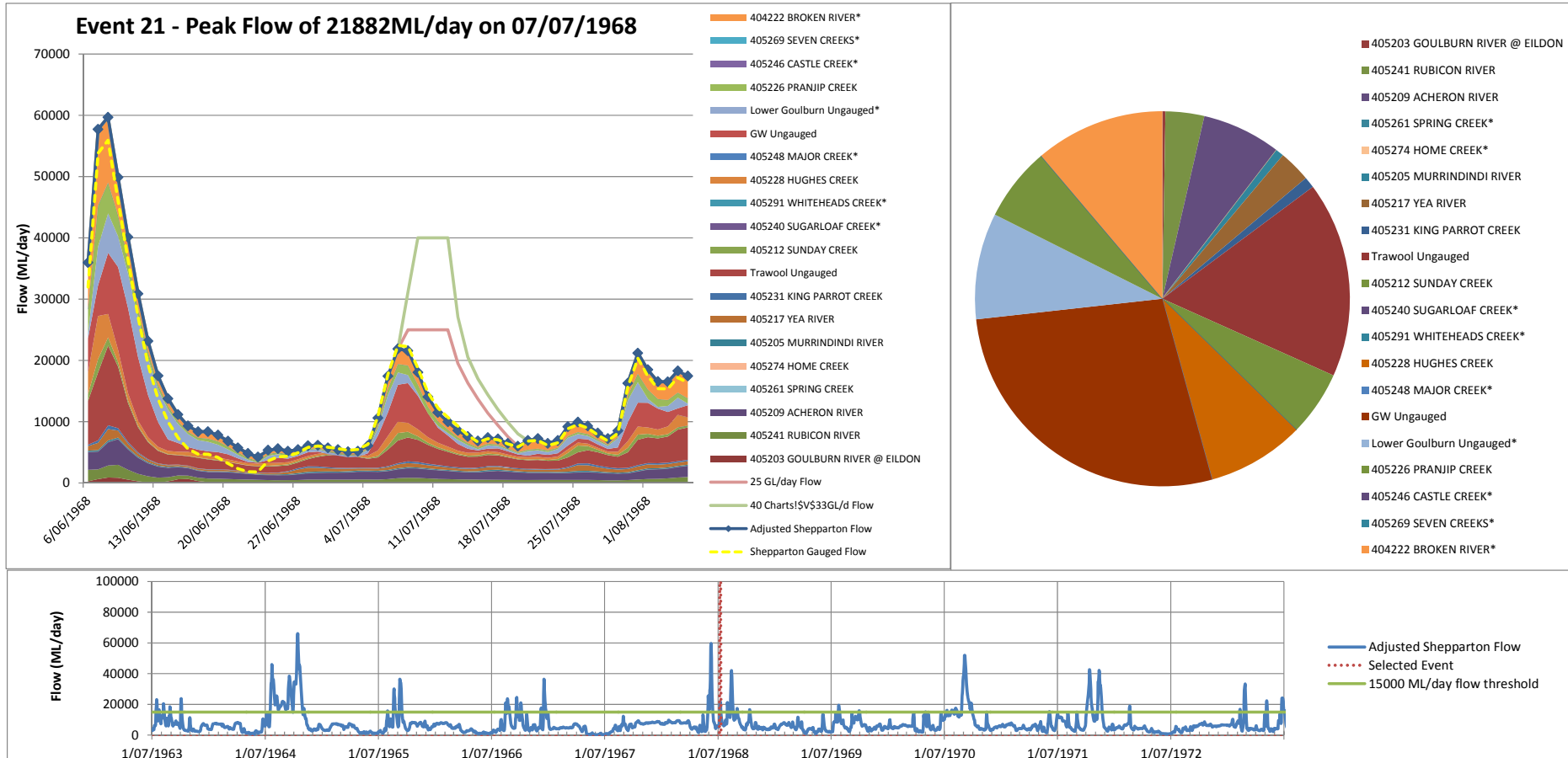
Event 17 - Peak Flow of 20963ML/day on 03/10/1966



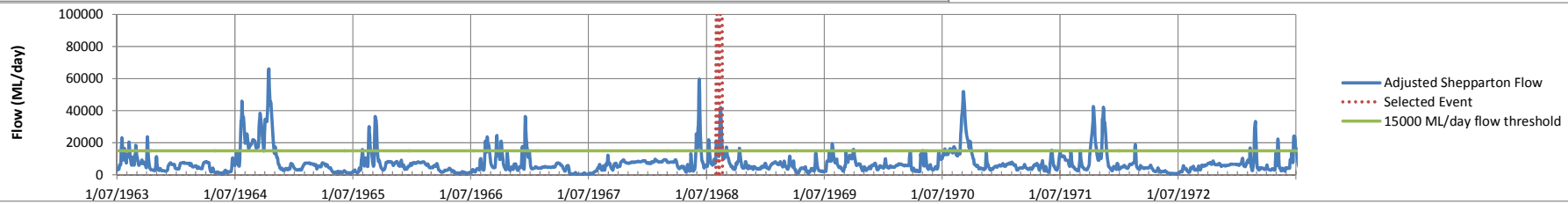
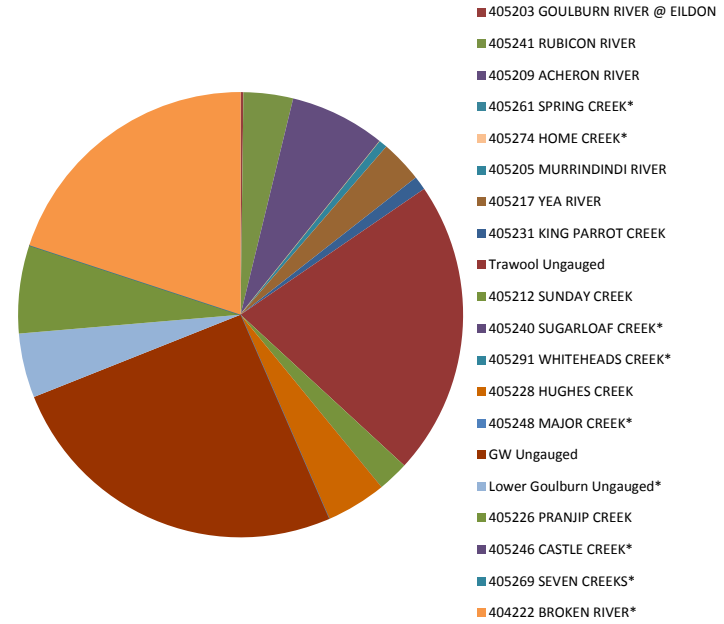
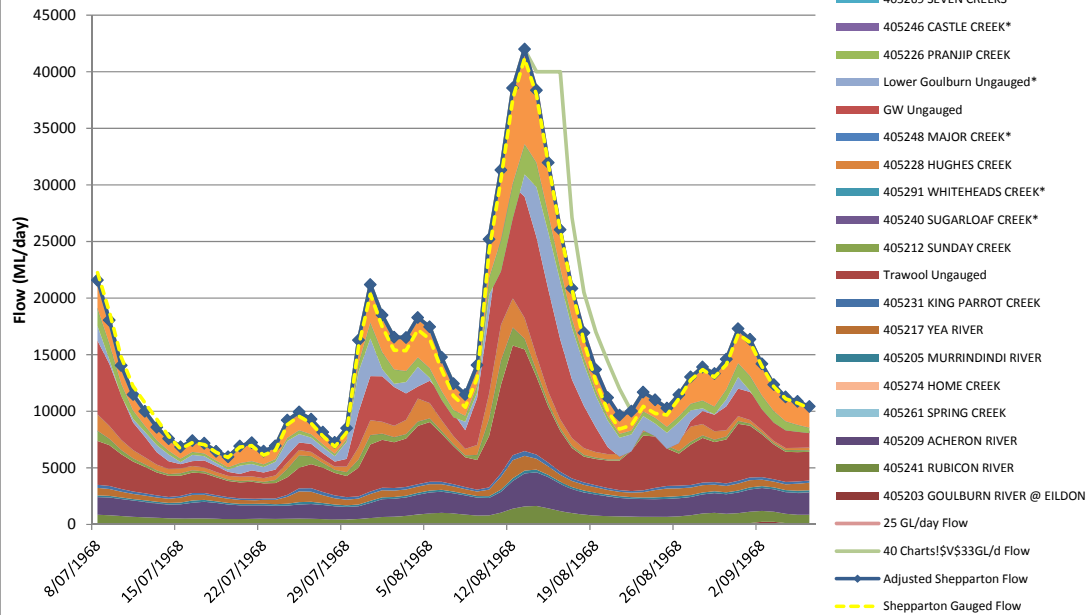


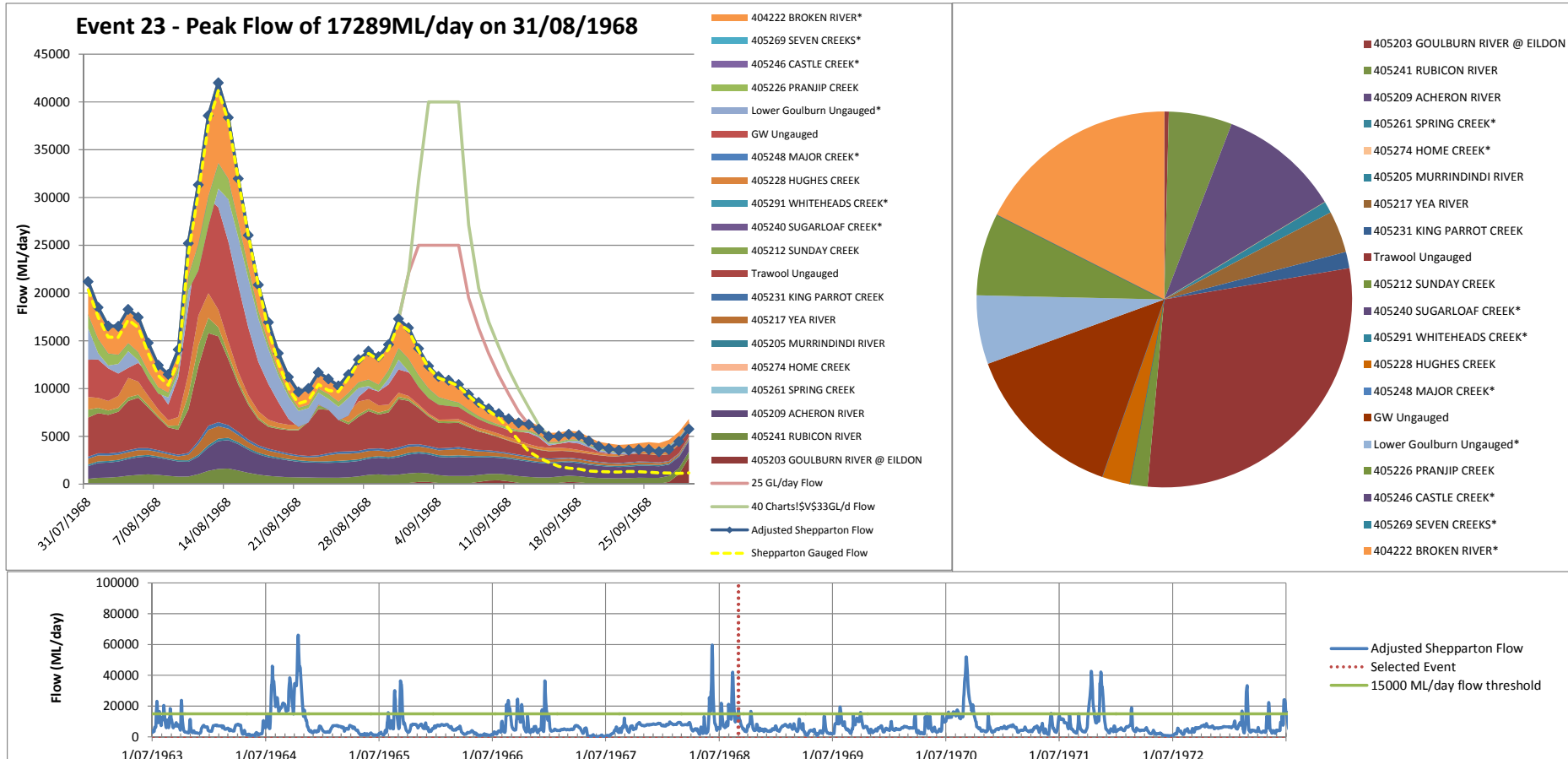




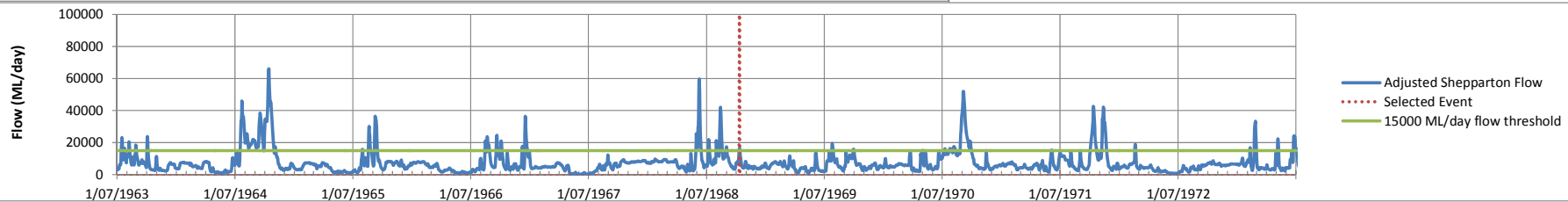
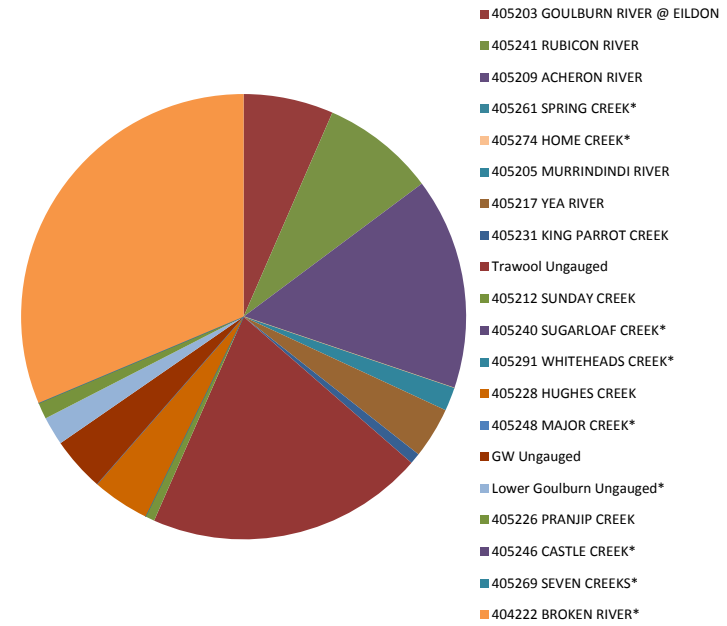
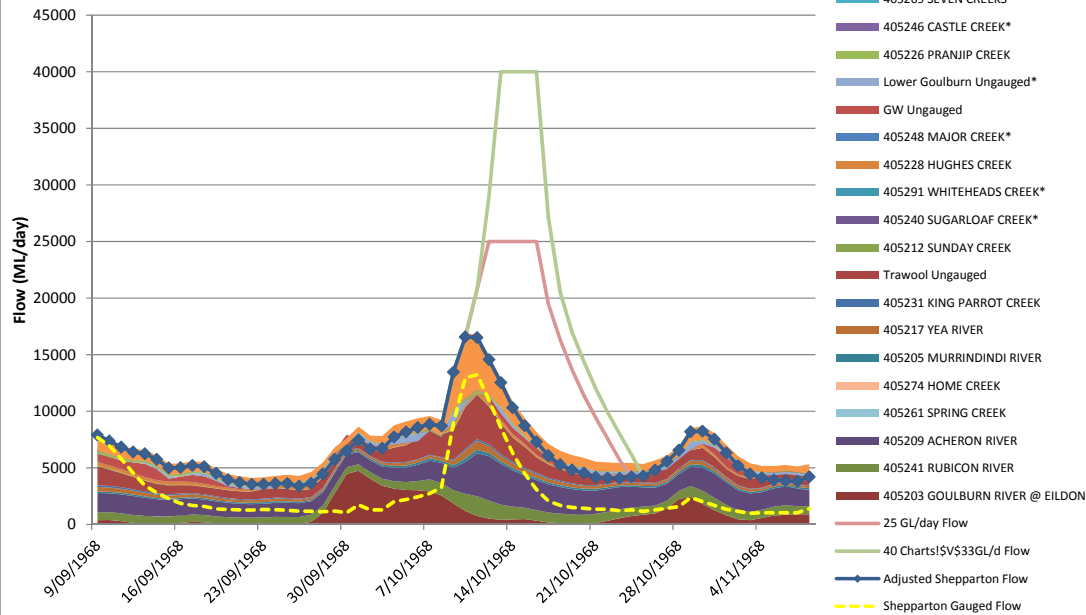


Event 22 - Peak Flow of 41990ML/day on 13/08/1968

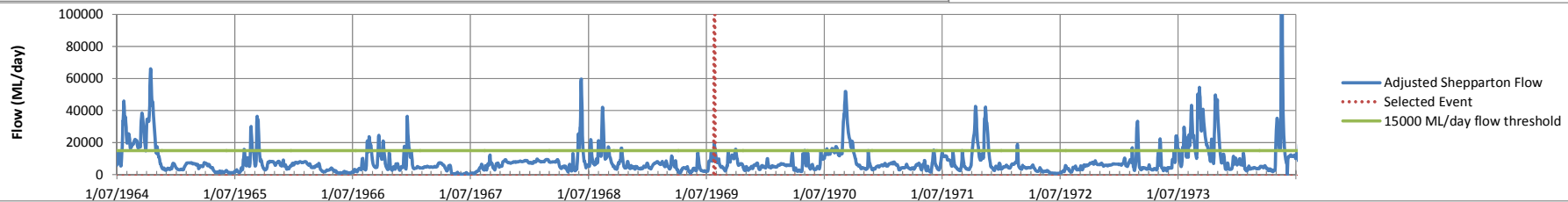
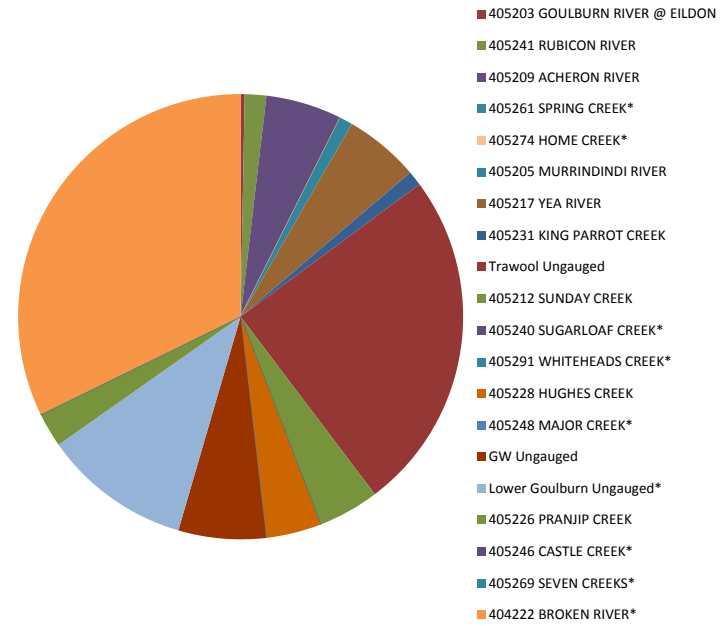
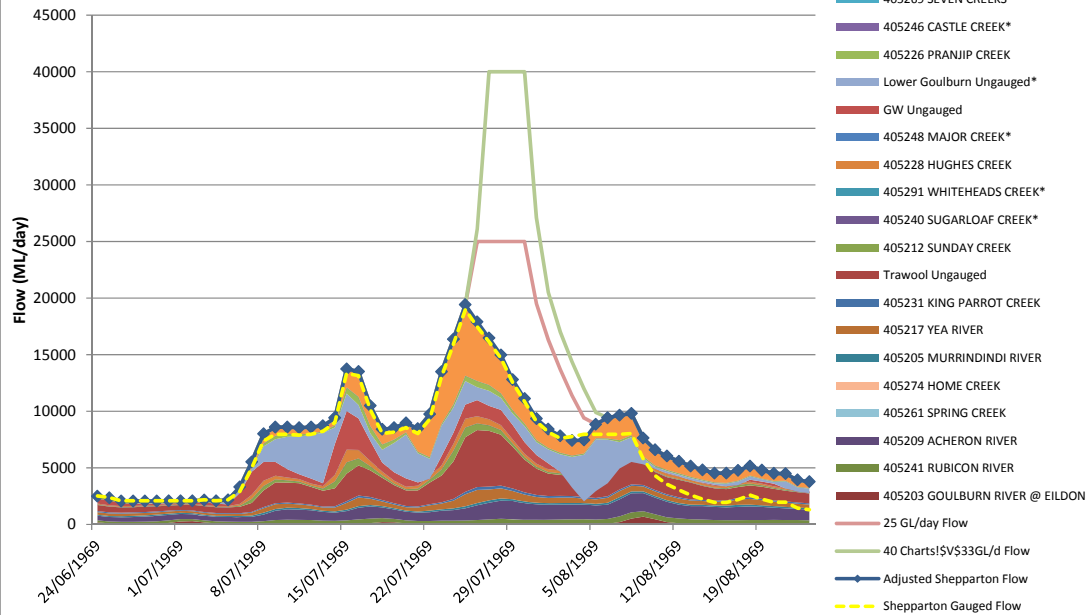




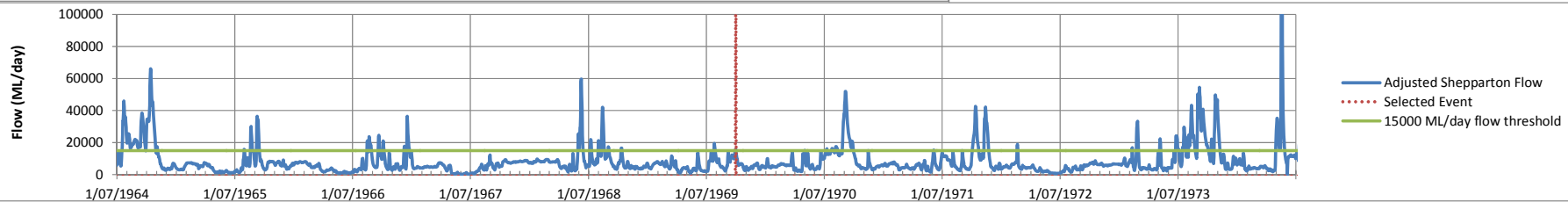
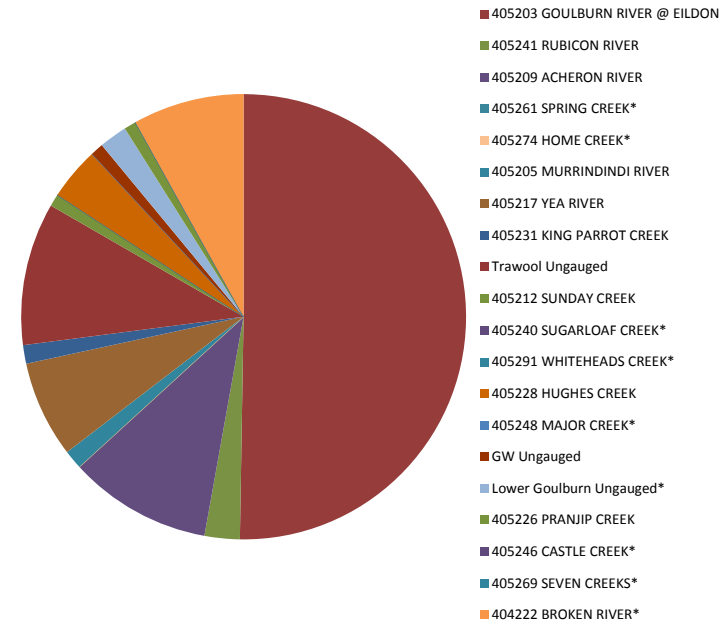
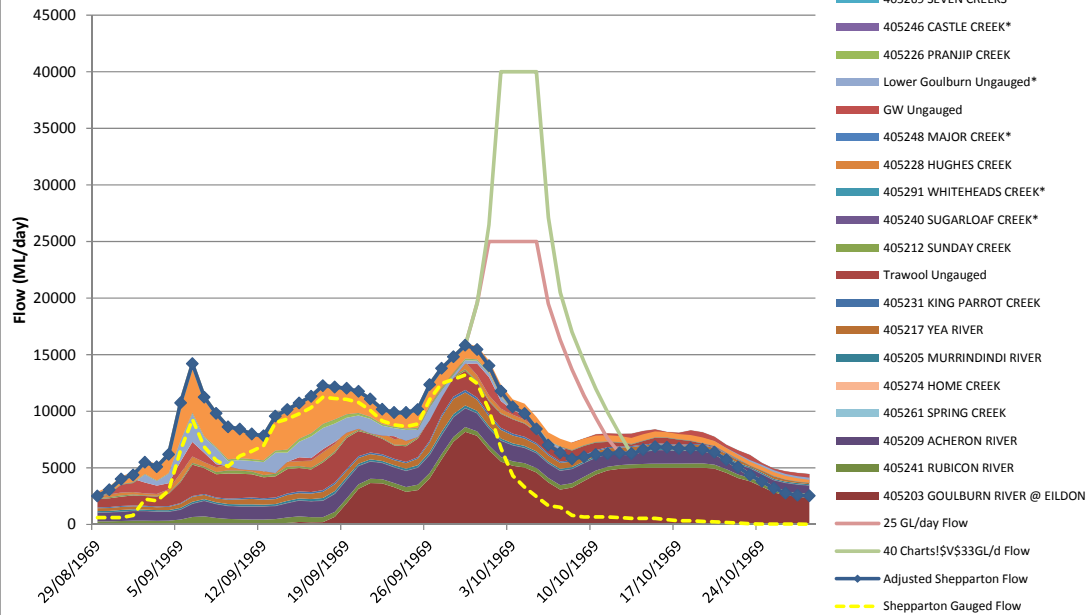
Event 24 - Peak Flow of 16566ML/day on 10/10/1968



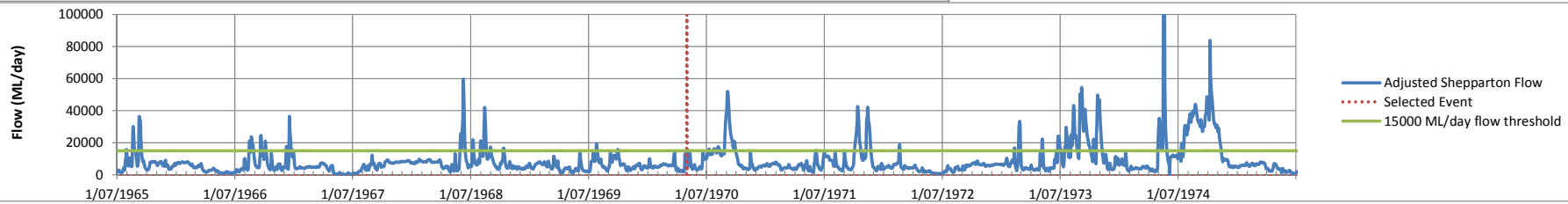
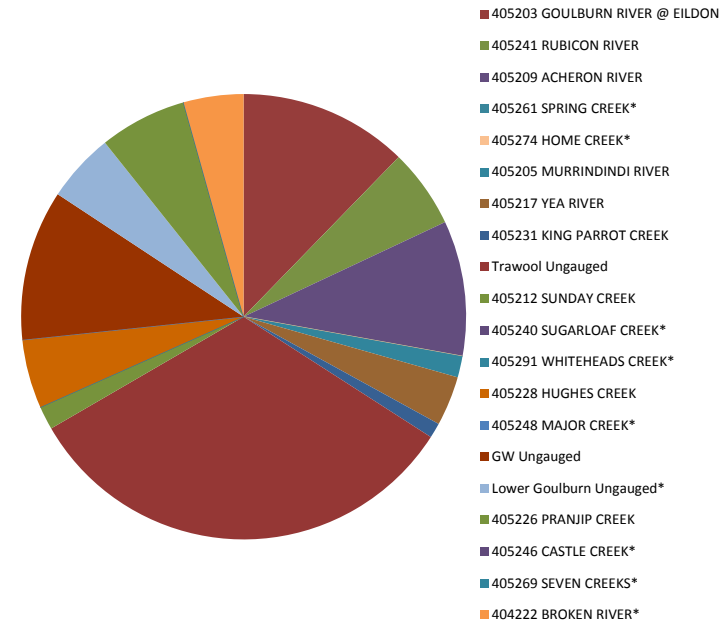
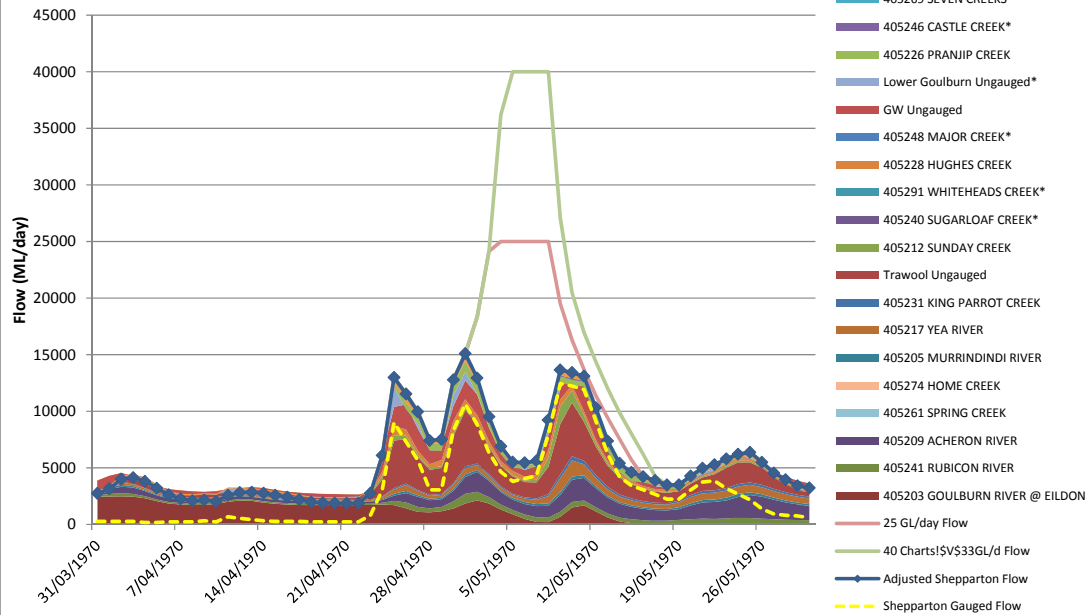
Event 25 - Peak Flow of 19417ML/day on 25/07/1969

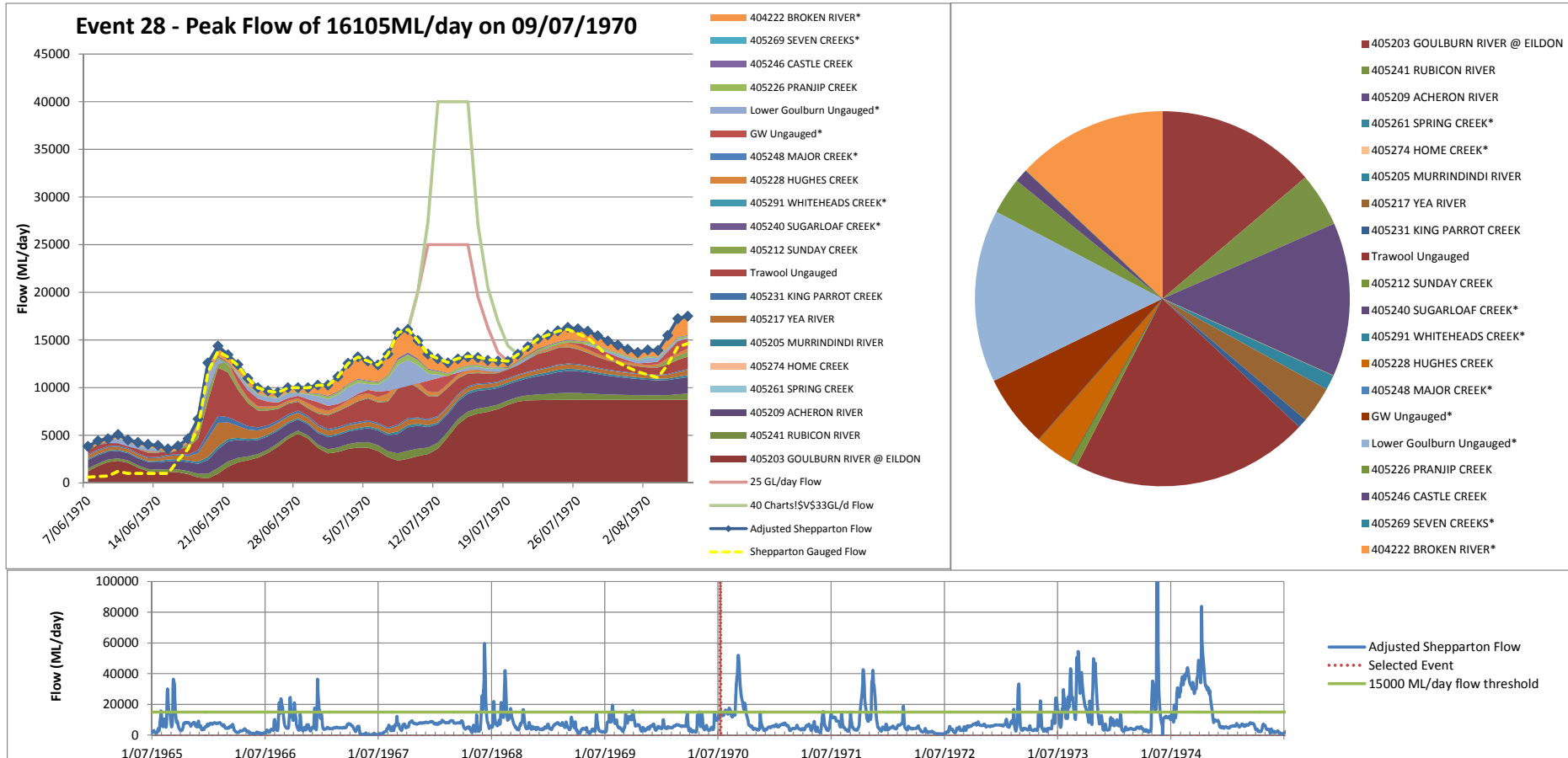


Event 26 - Peak Flow of 15833ML/day on 29/09/1969

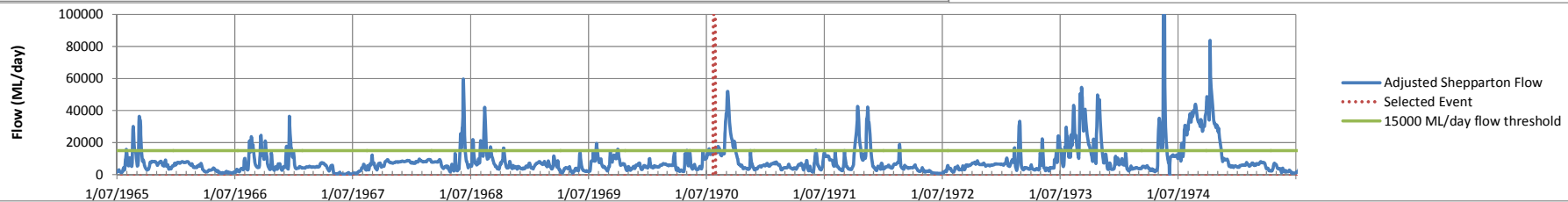
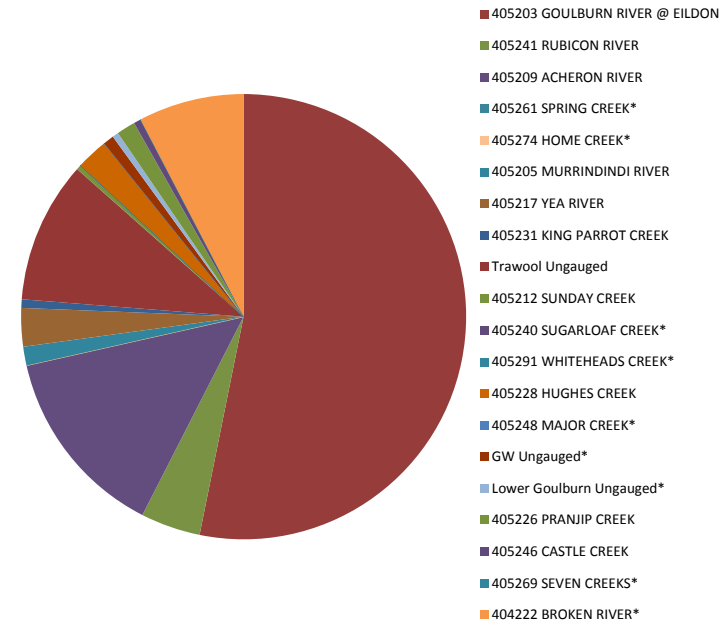
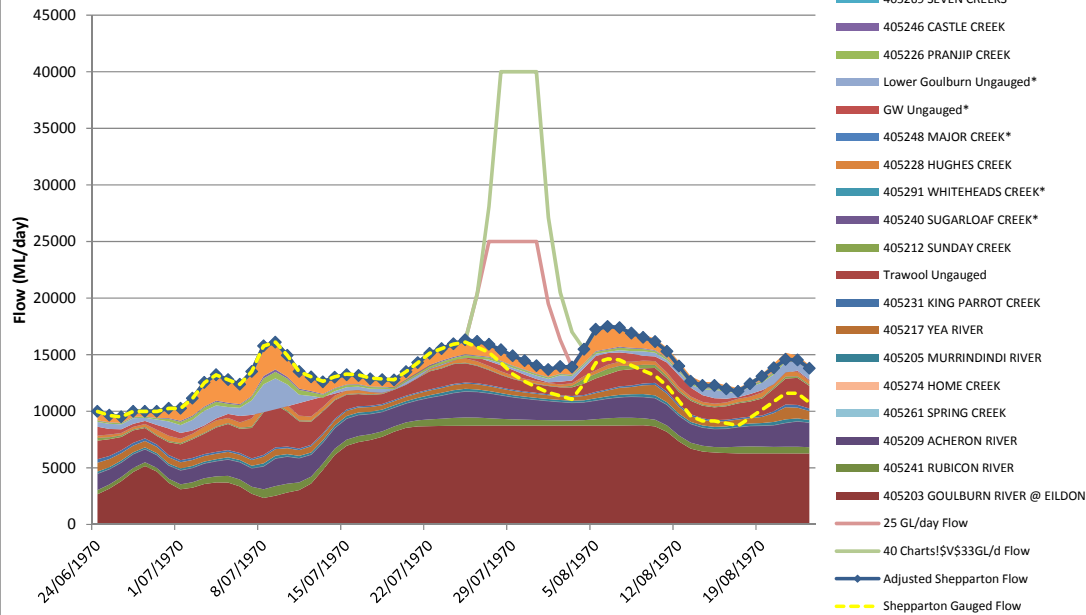


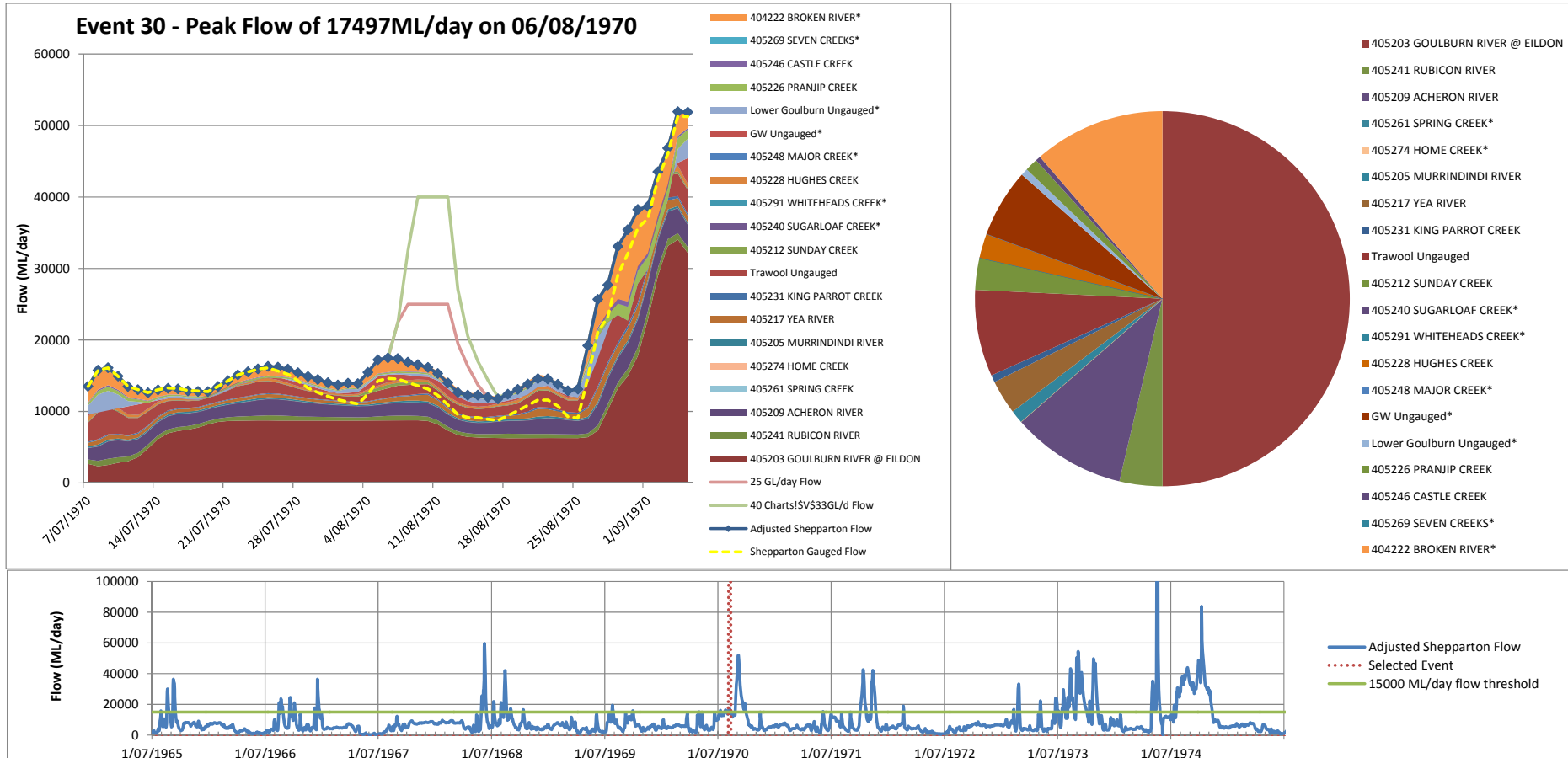
Event 27 - Peak Flow of 15097ML/day on 01/05/1970

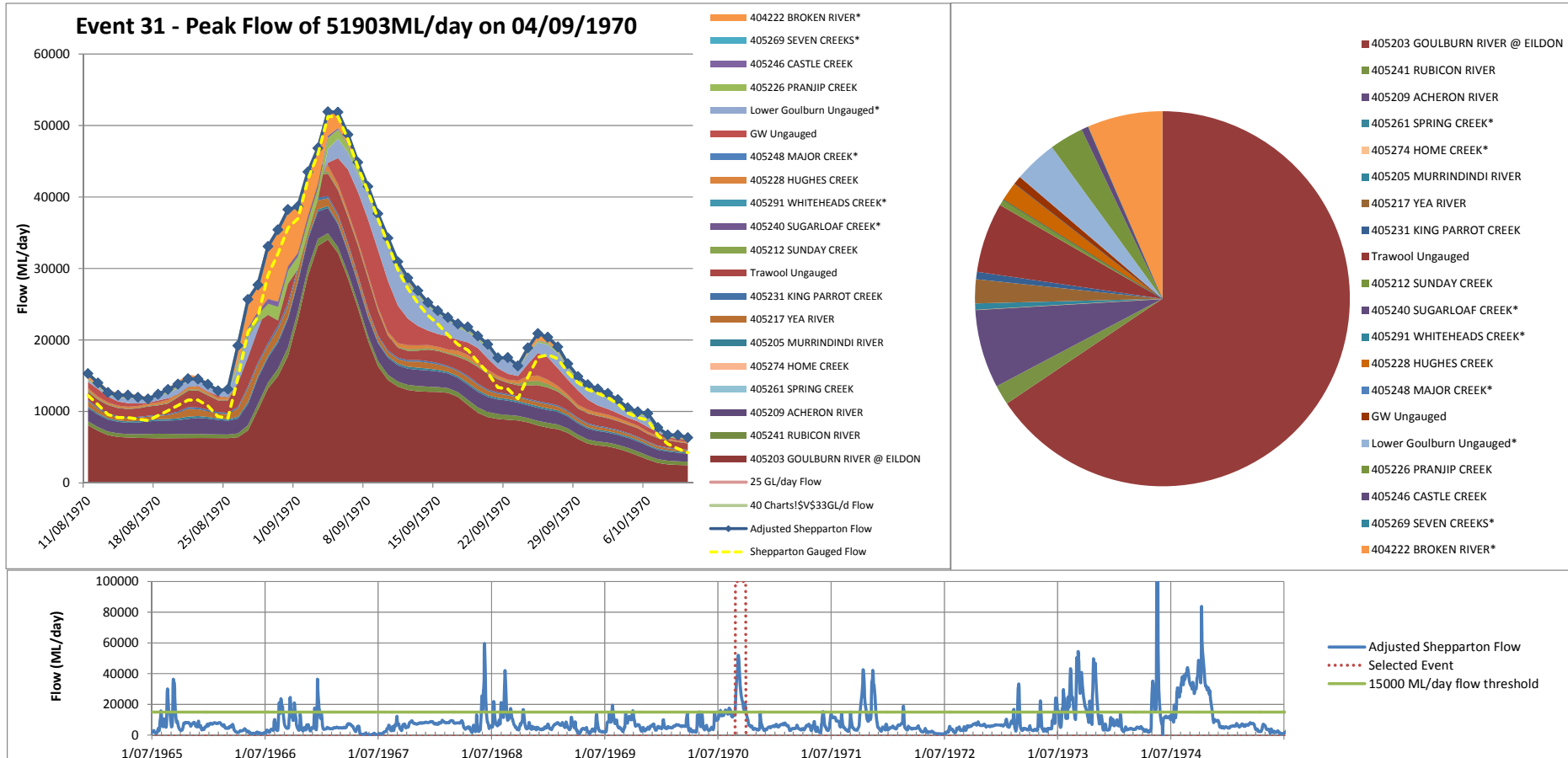




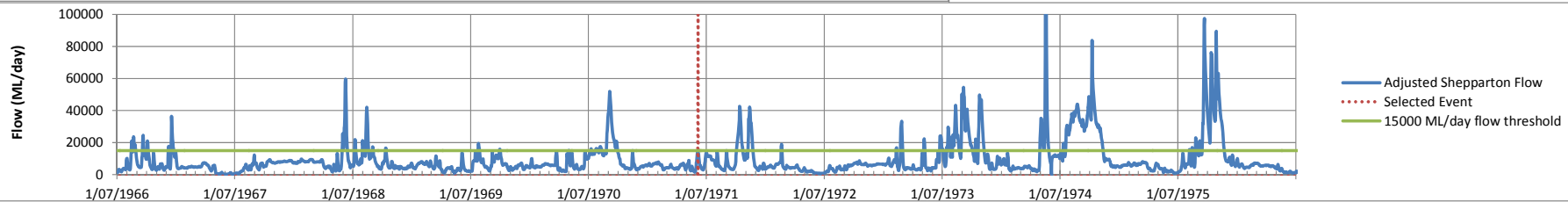
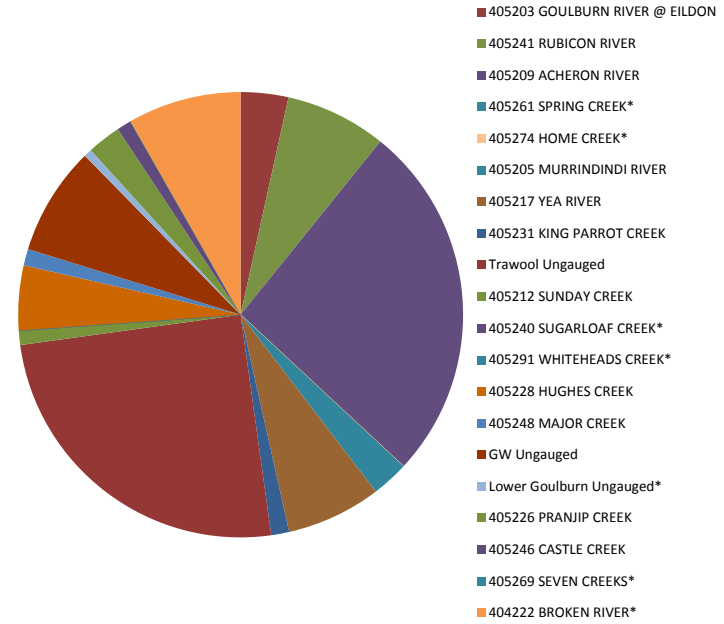
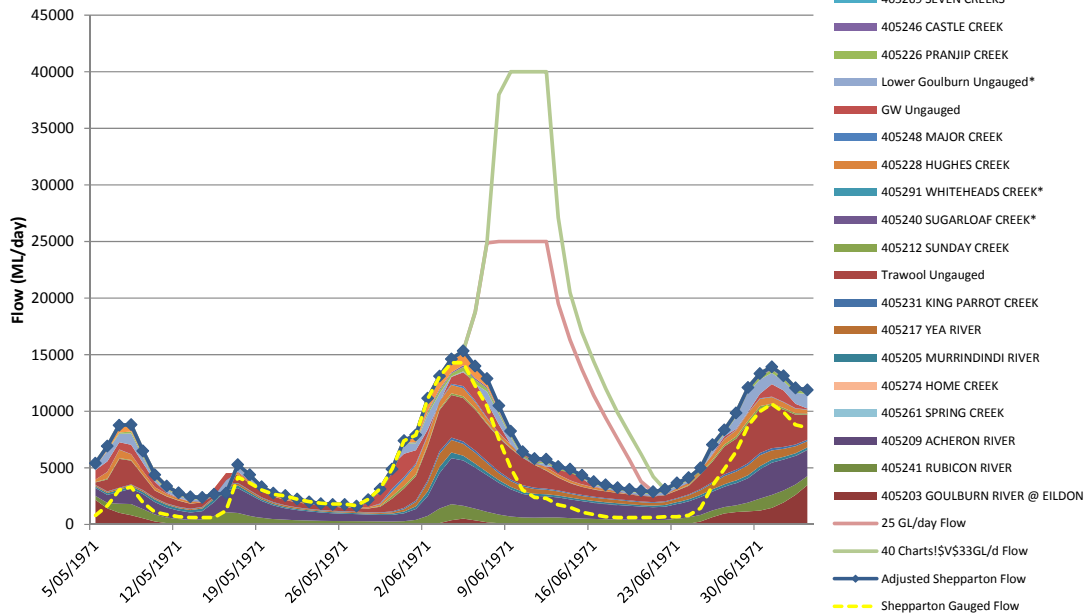
Event 29 - Peak Flow of 16309ML/day on 25/07/1970

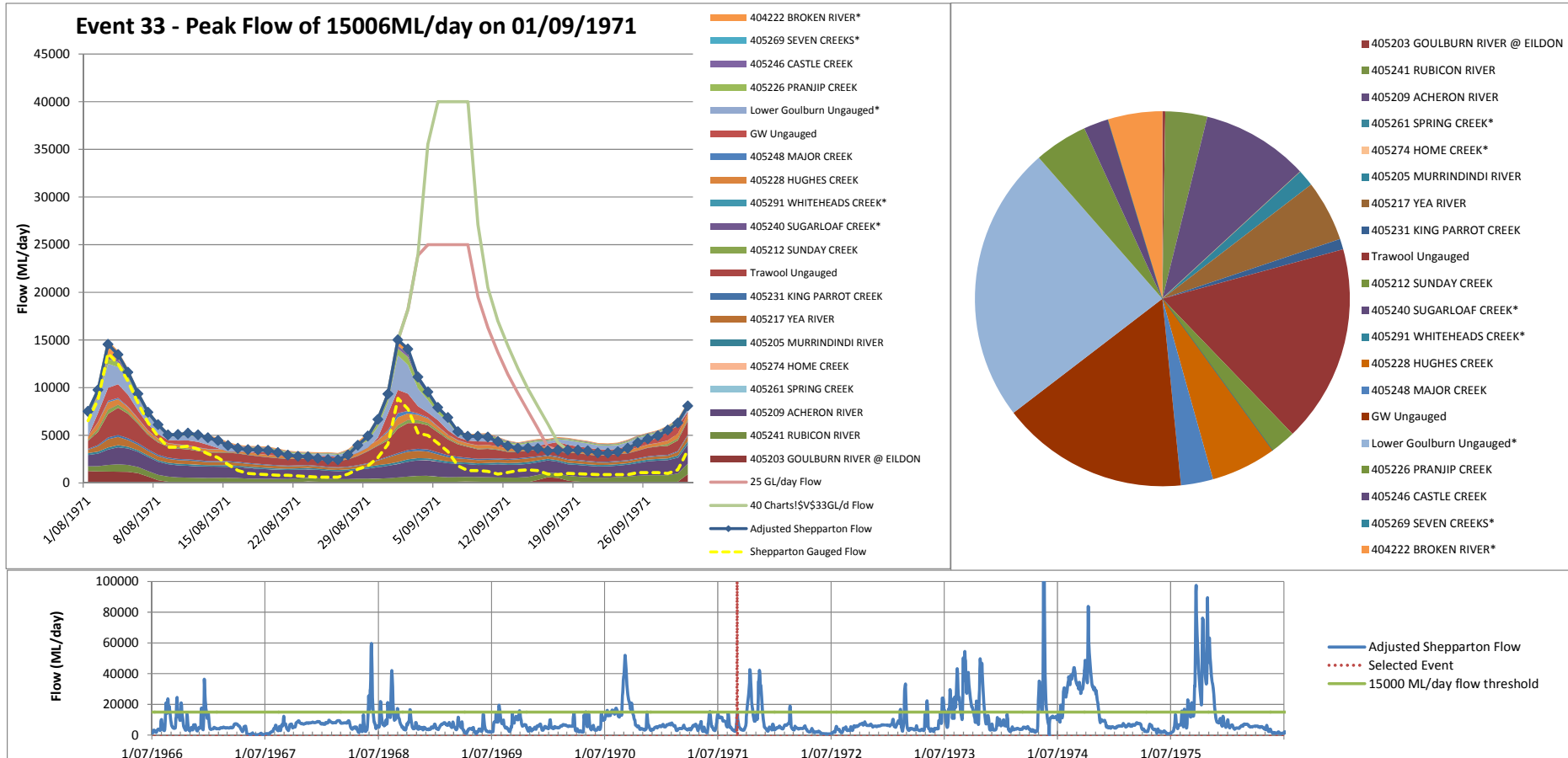


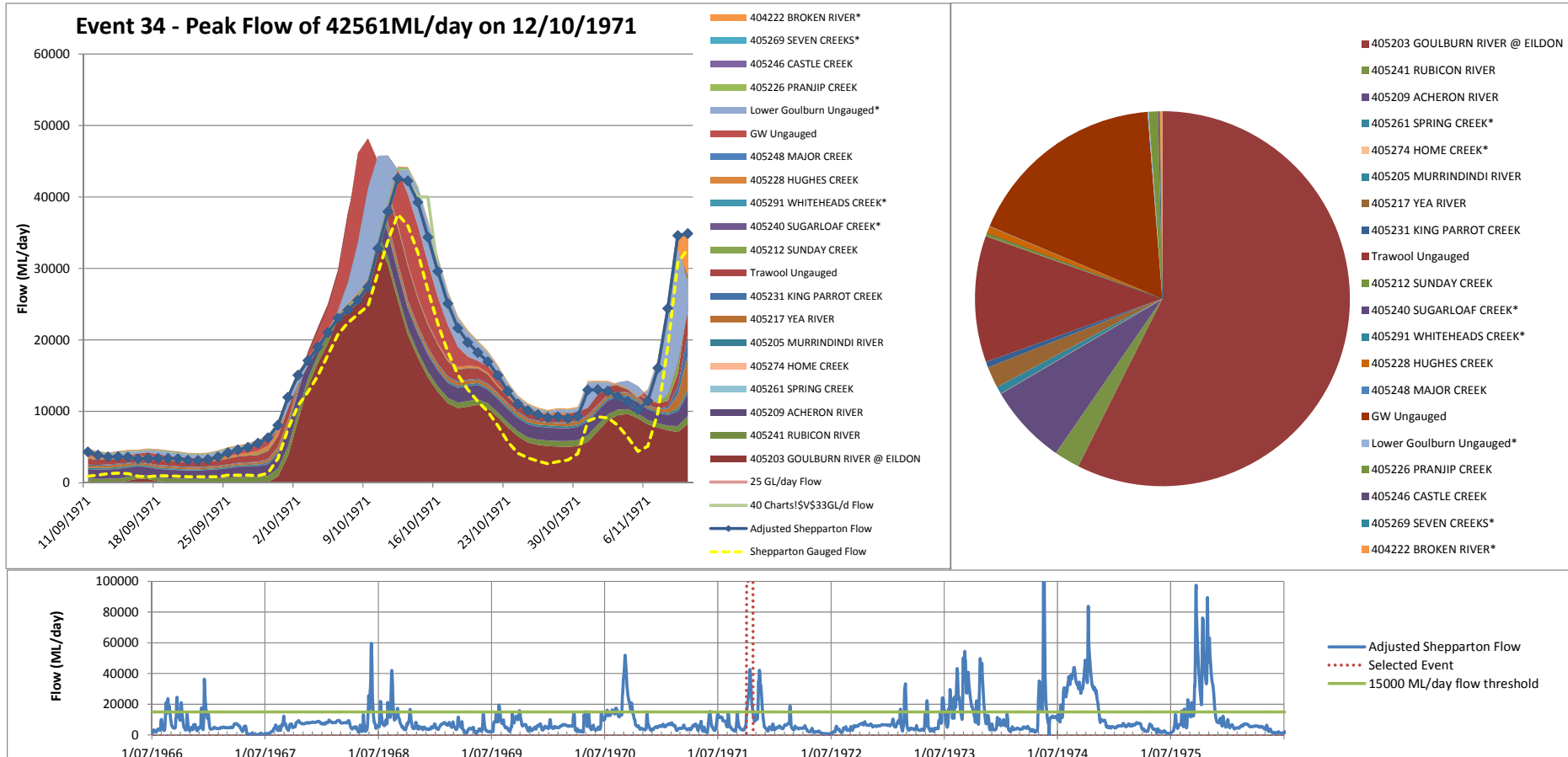


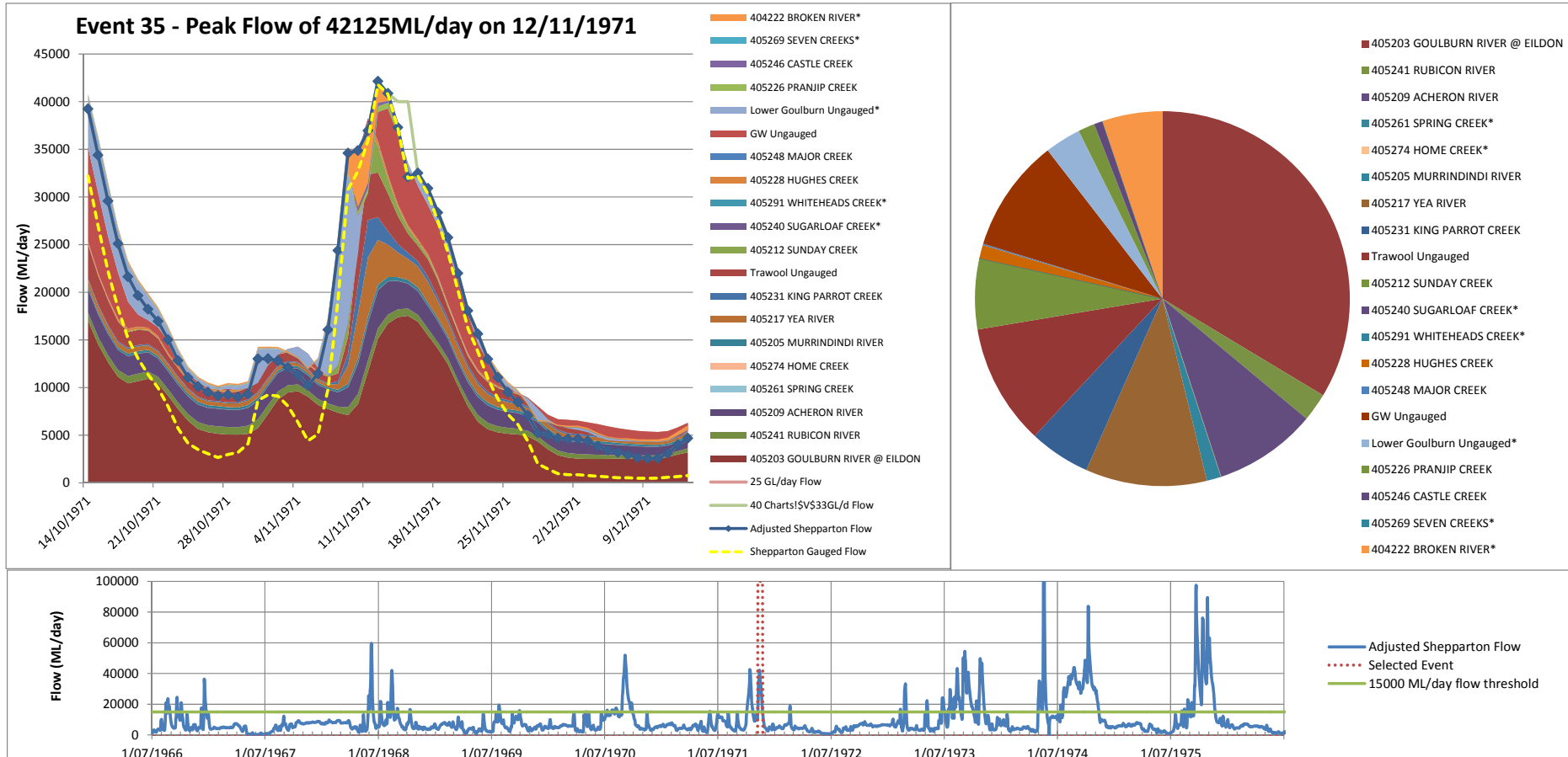


Event 32 - Peak Flow of 15340ML/day on 05/06/1971

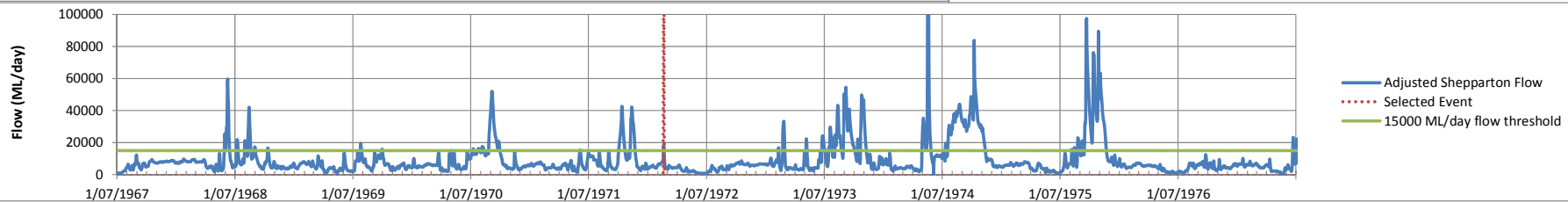
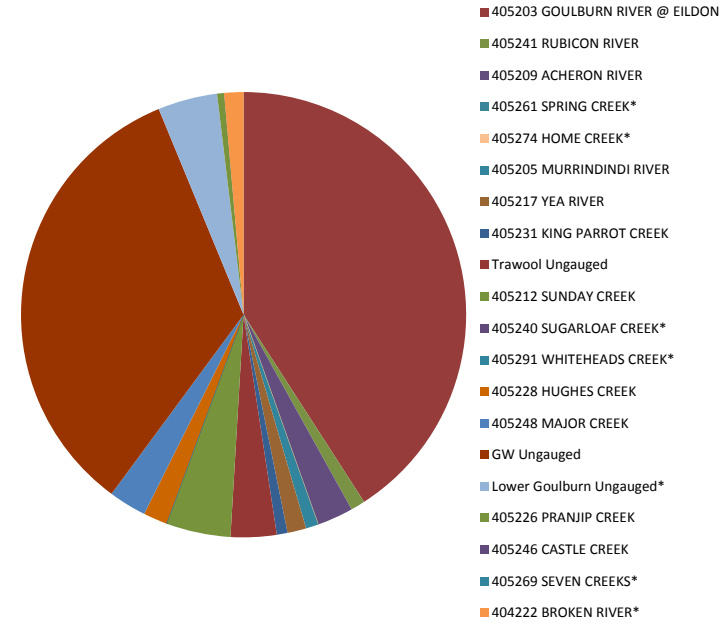
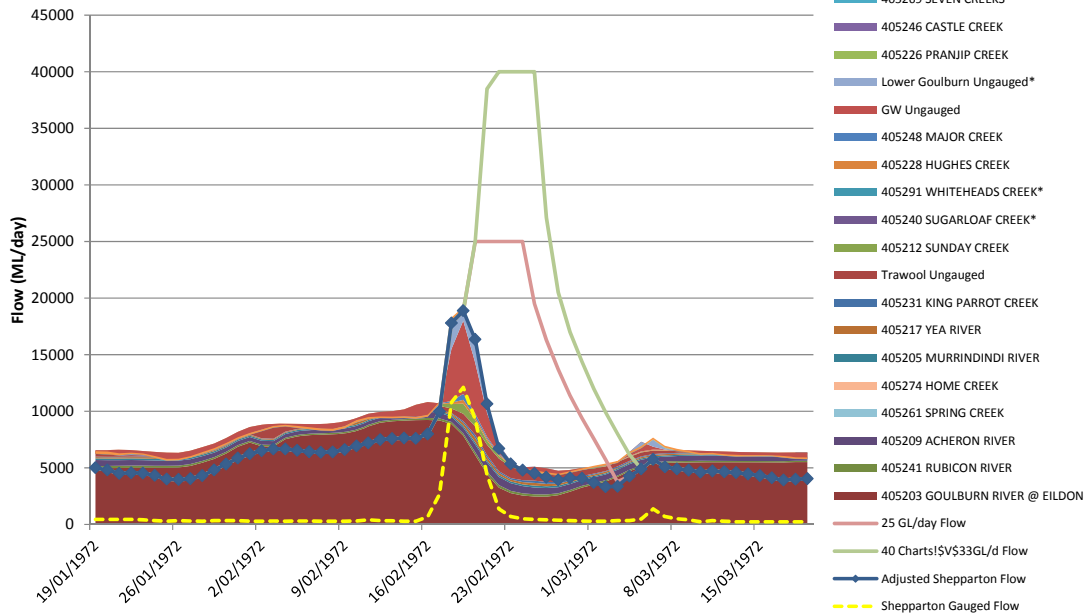




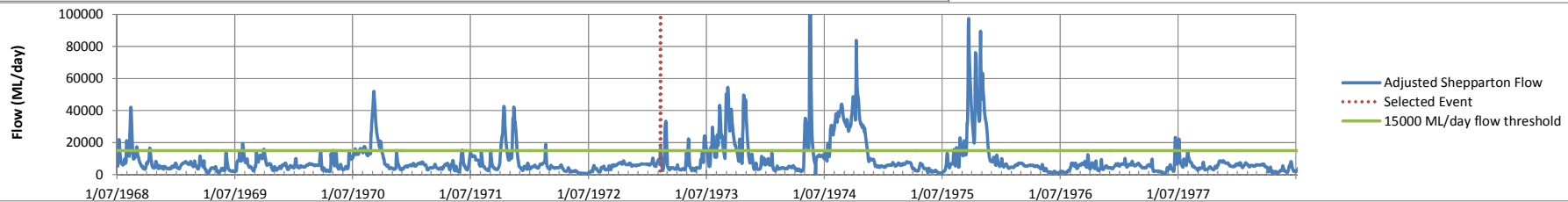
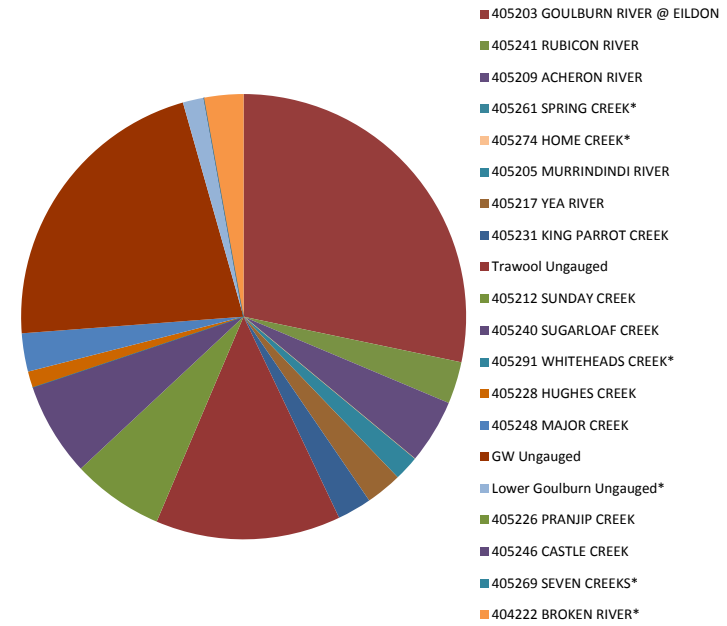
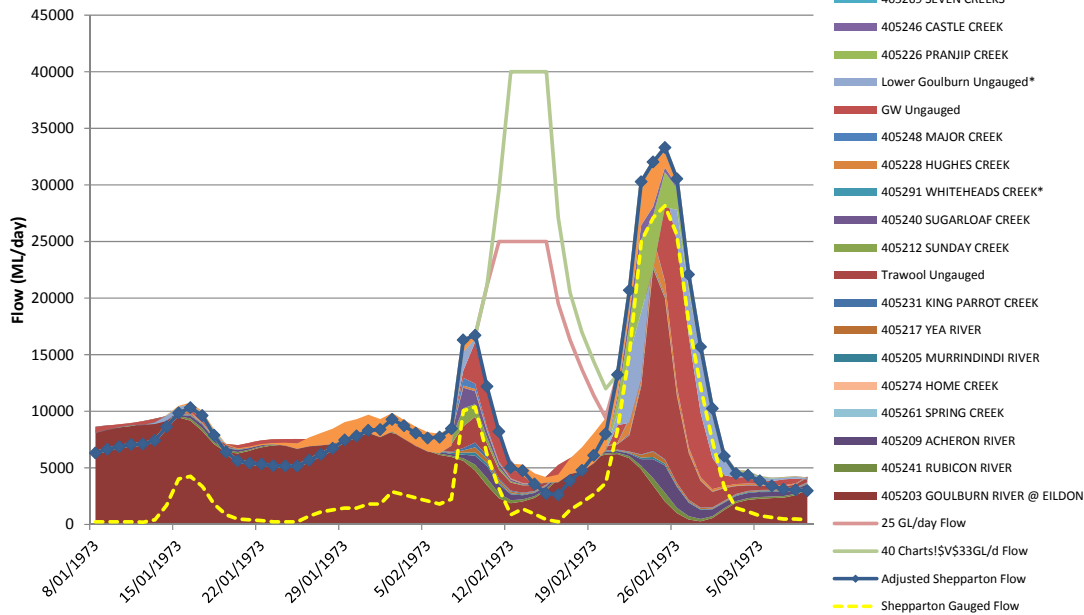




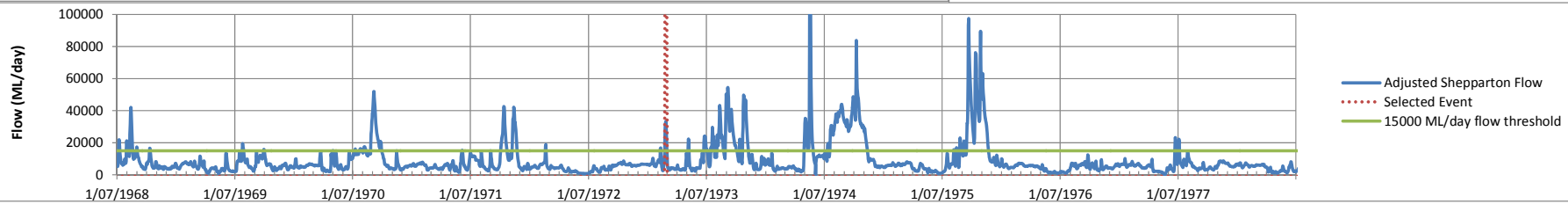
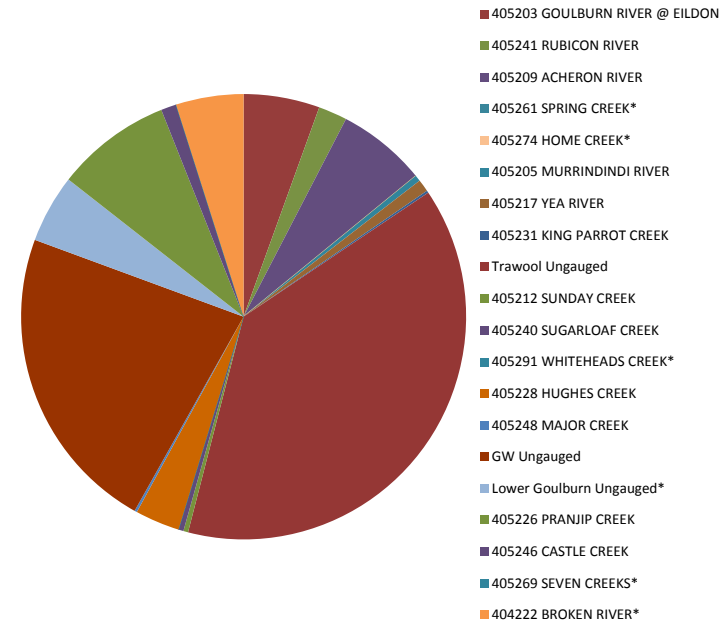
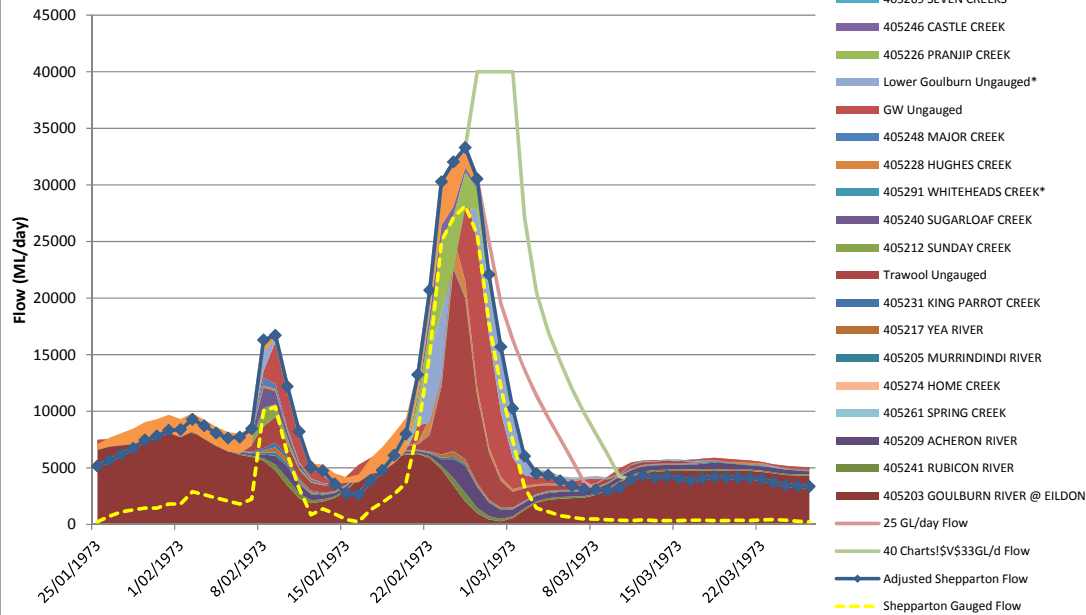
Event 36 - Peak Flow of 18884ML/day on 19/02/1972



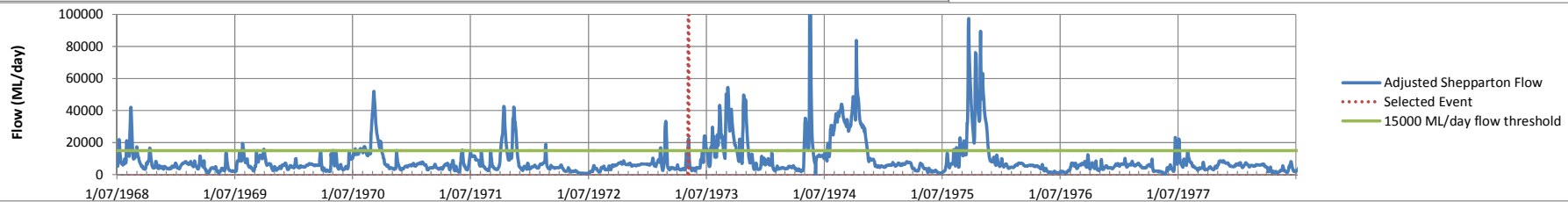
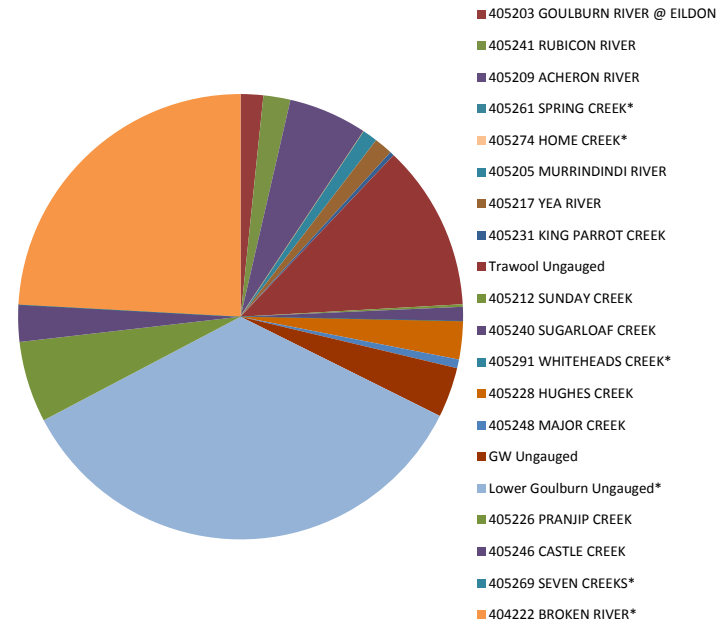
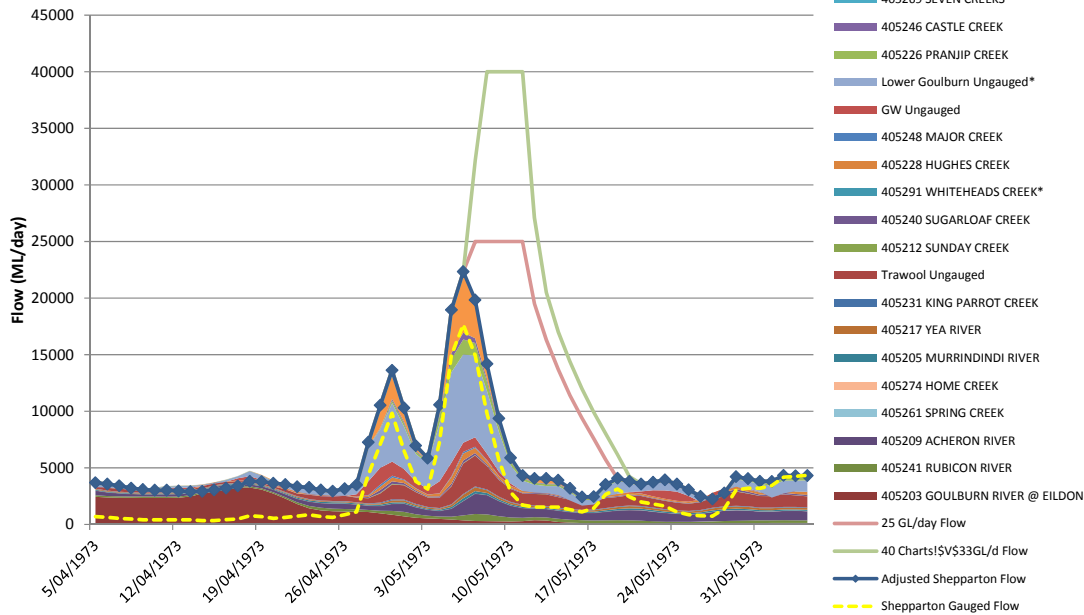
Event 37 - Peak Flow of 16708ML/day on 09/02/1973

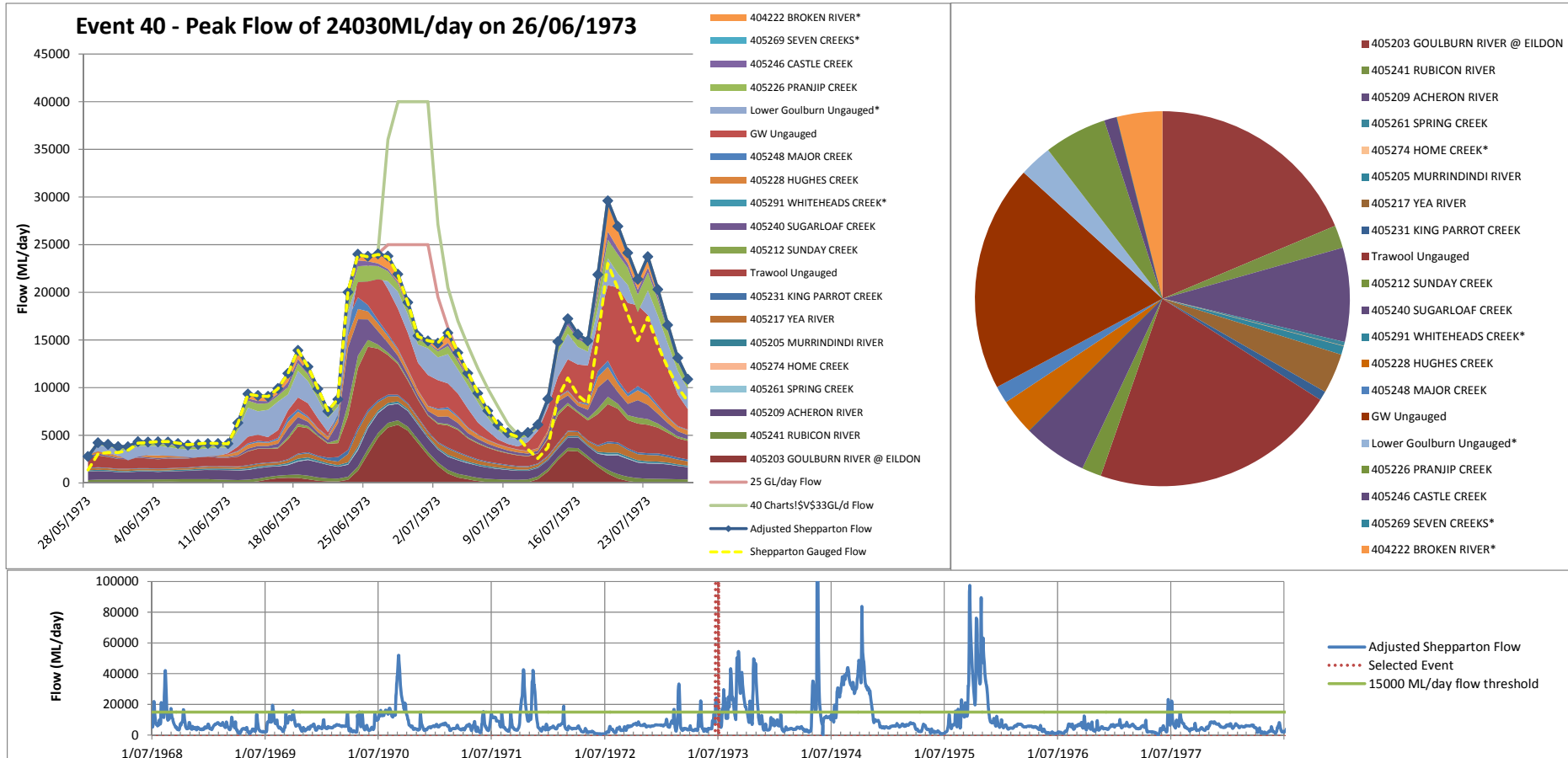


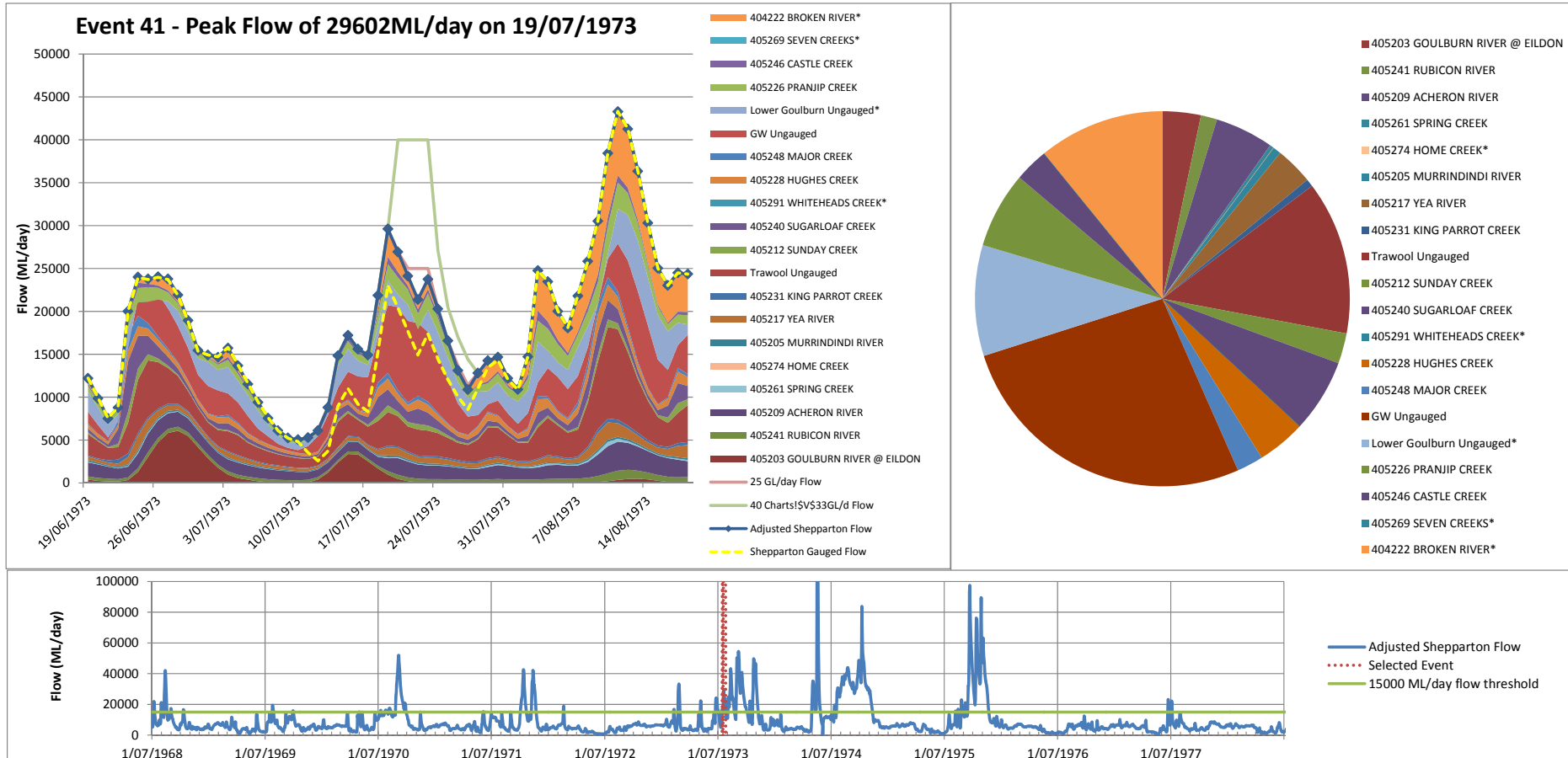
Event 38 - Peak Flow of 33296ML/day on 25/02/1973

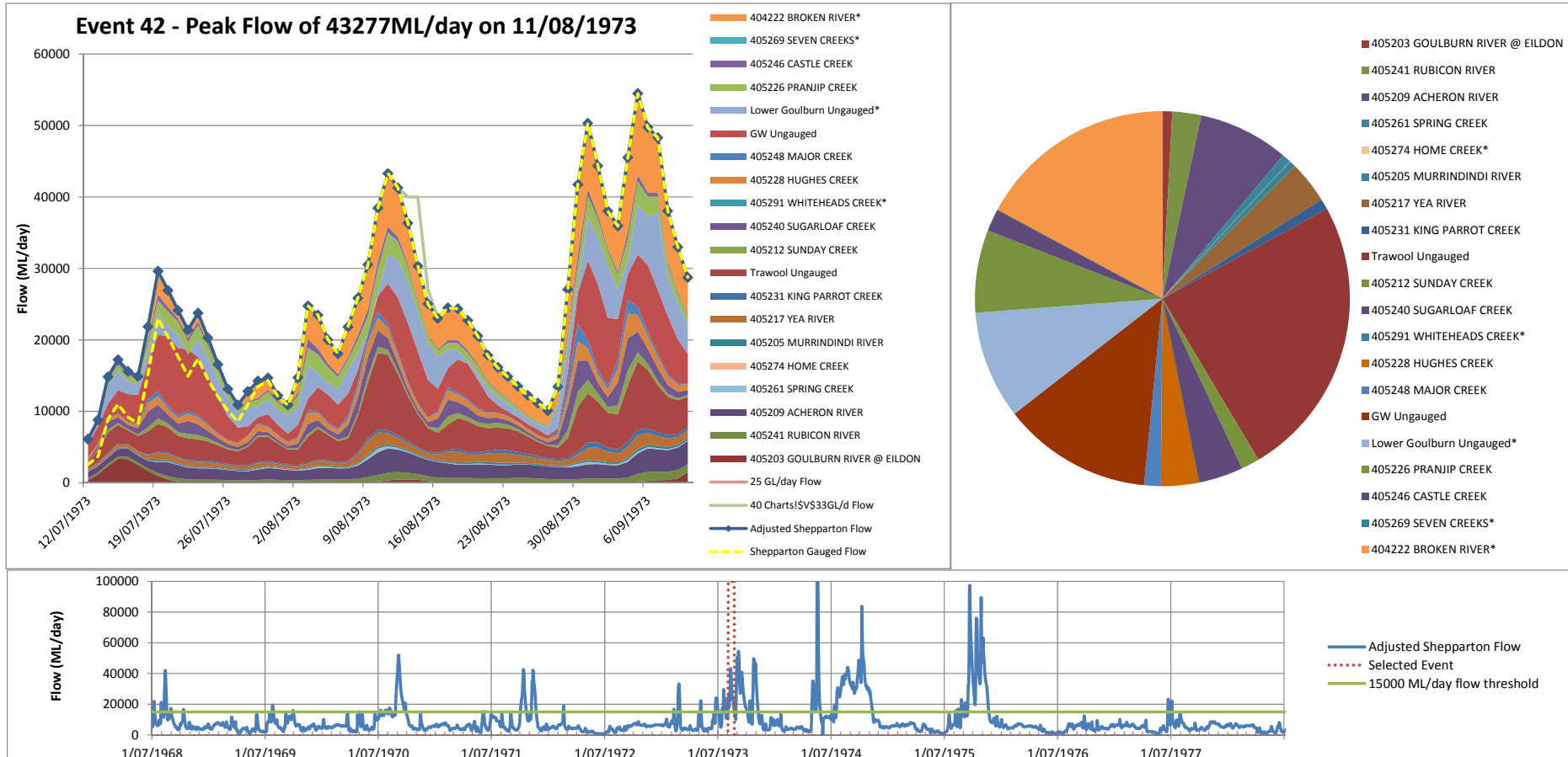


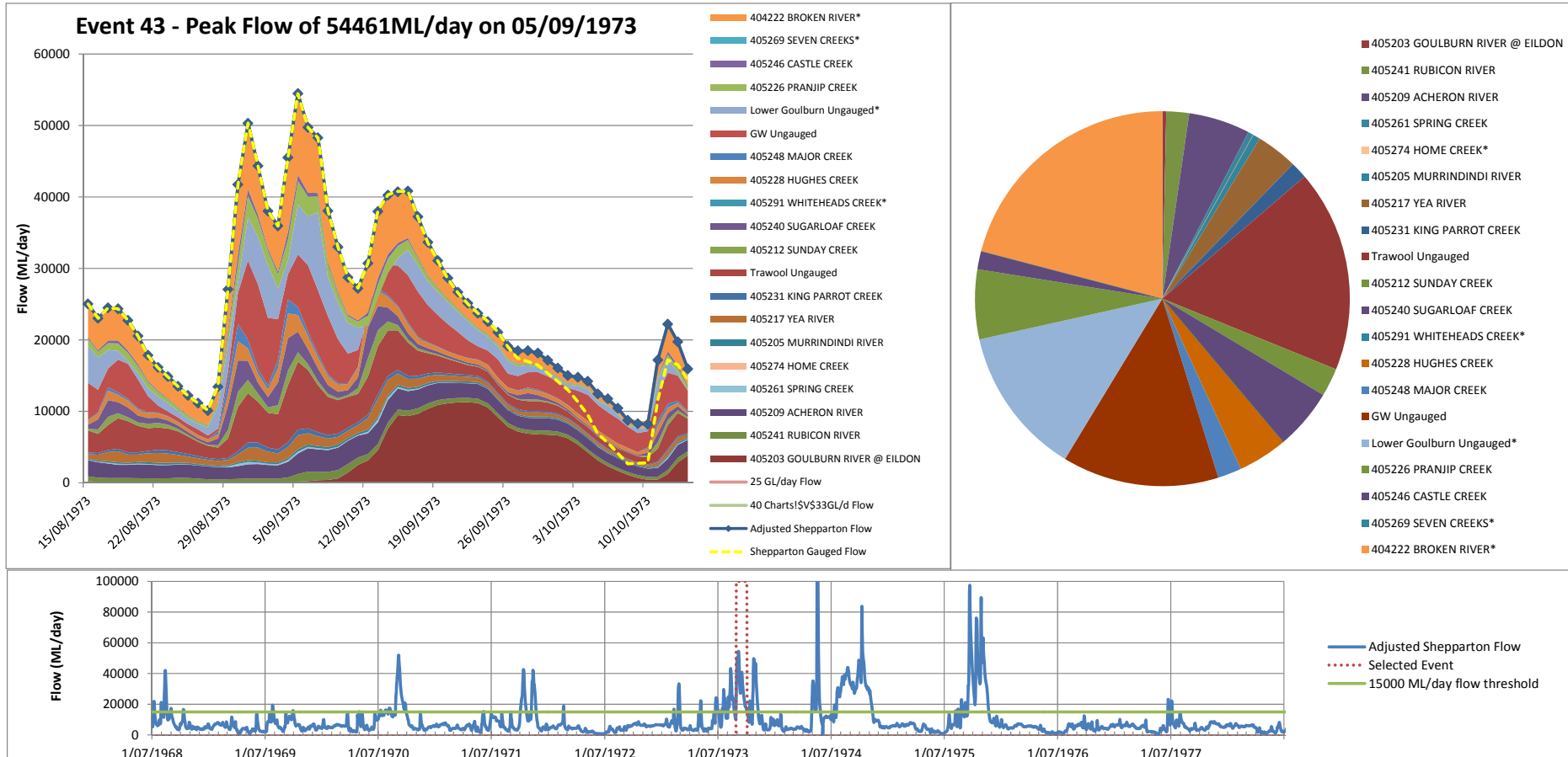
Event 39 - Peak Flow of 22336ML/day on 06/05/1973

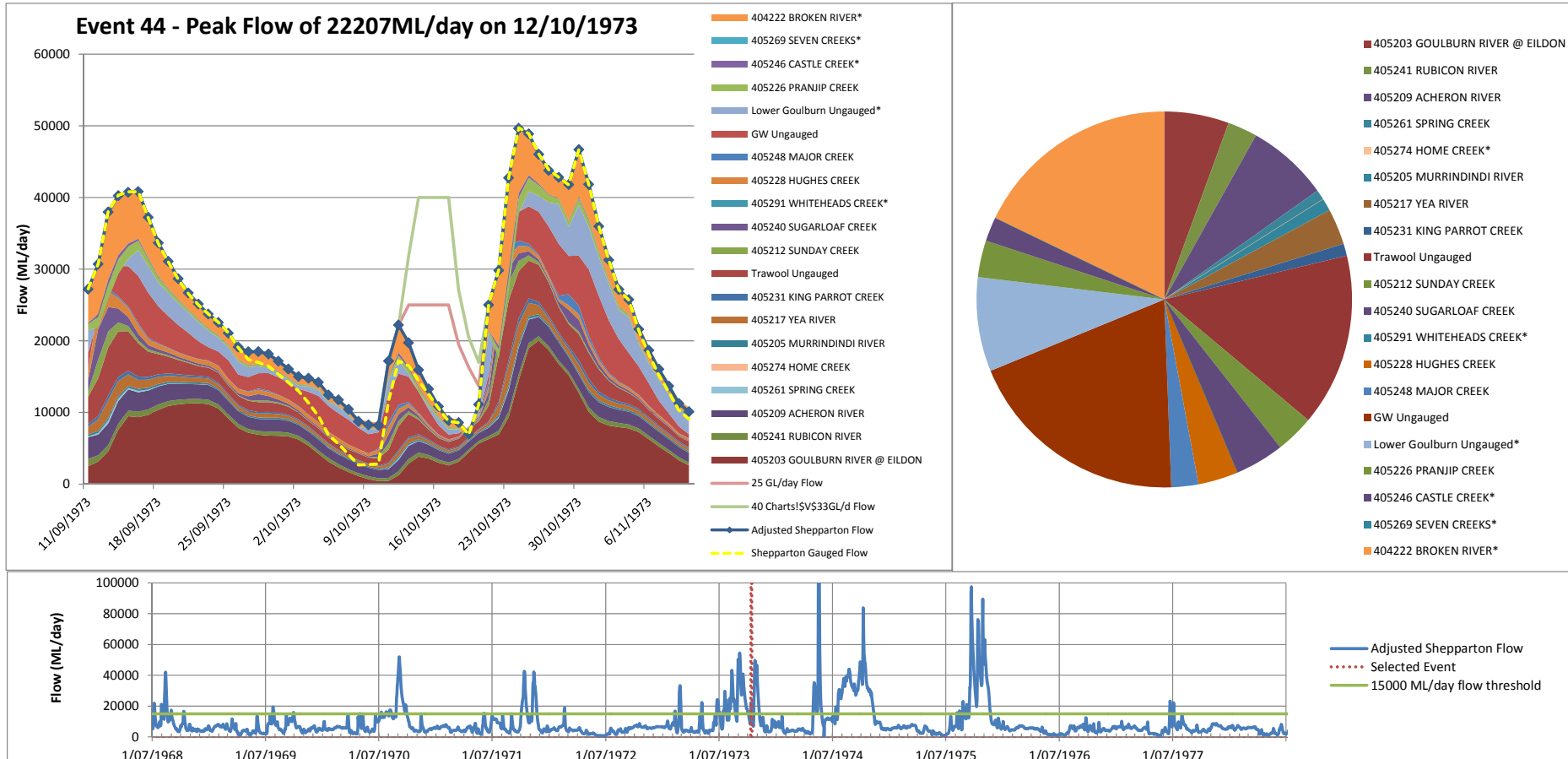




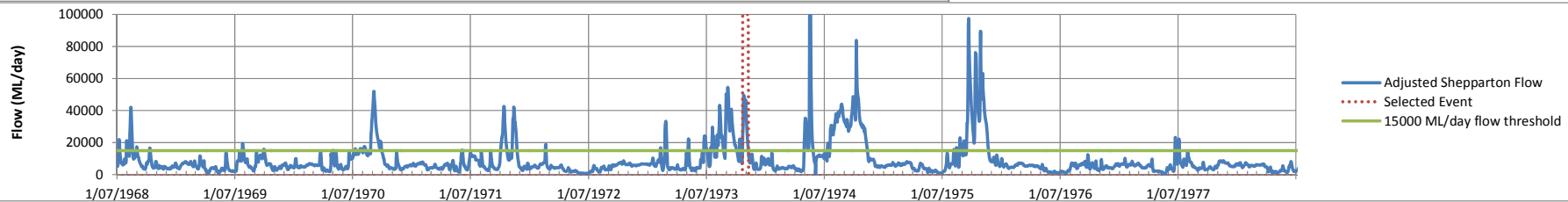
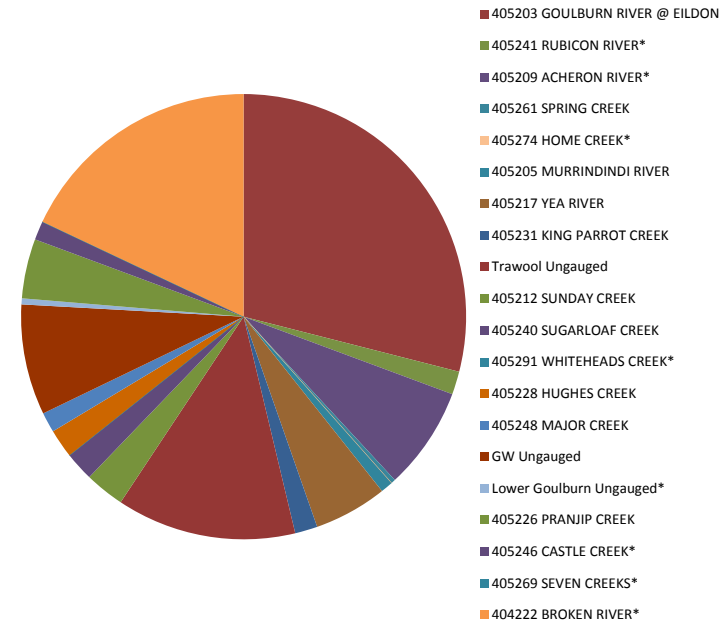
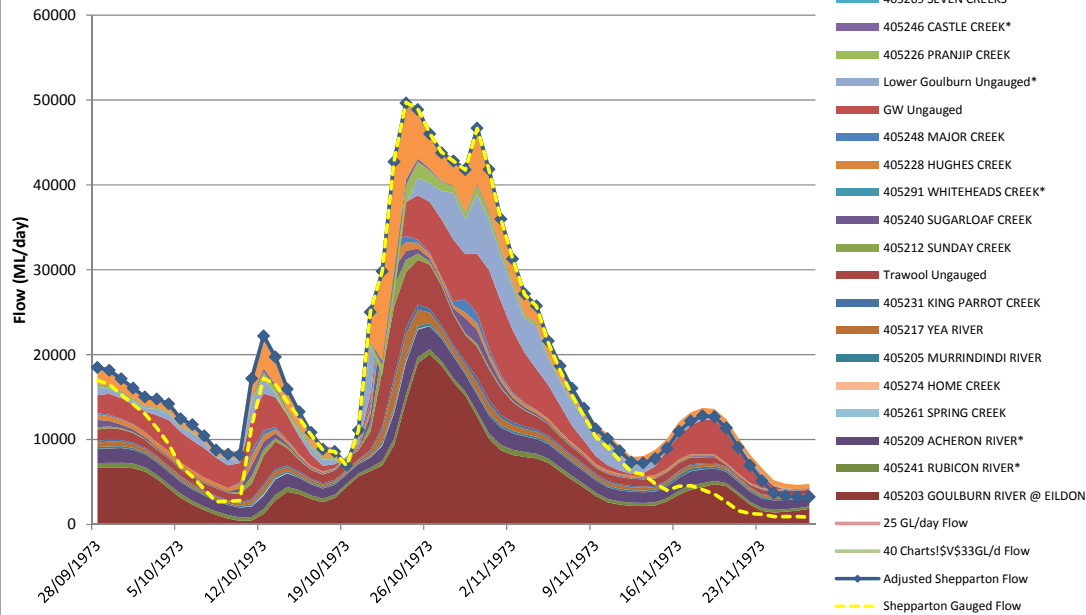




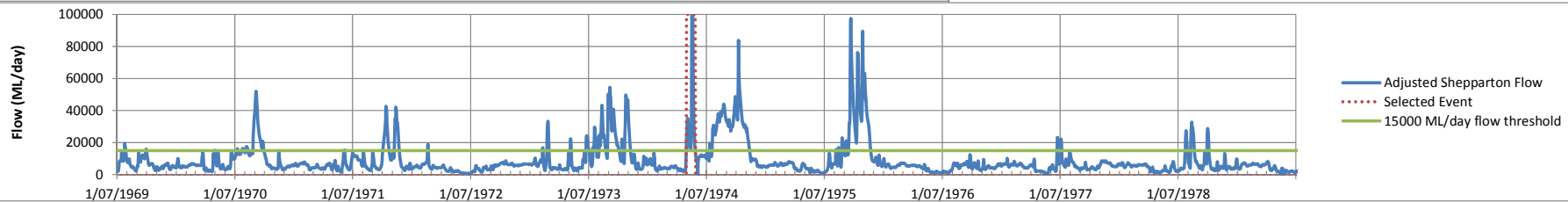
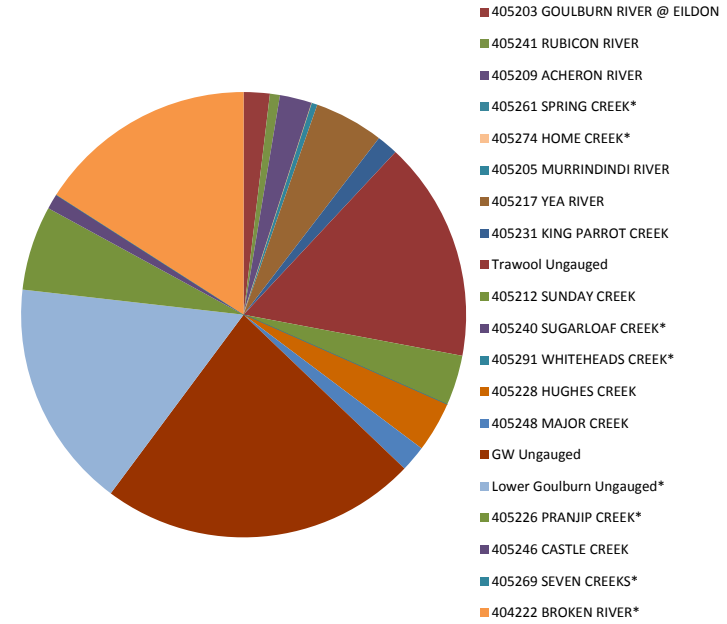
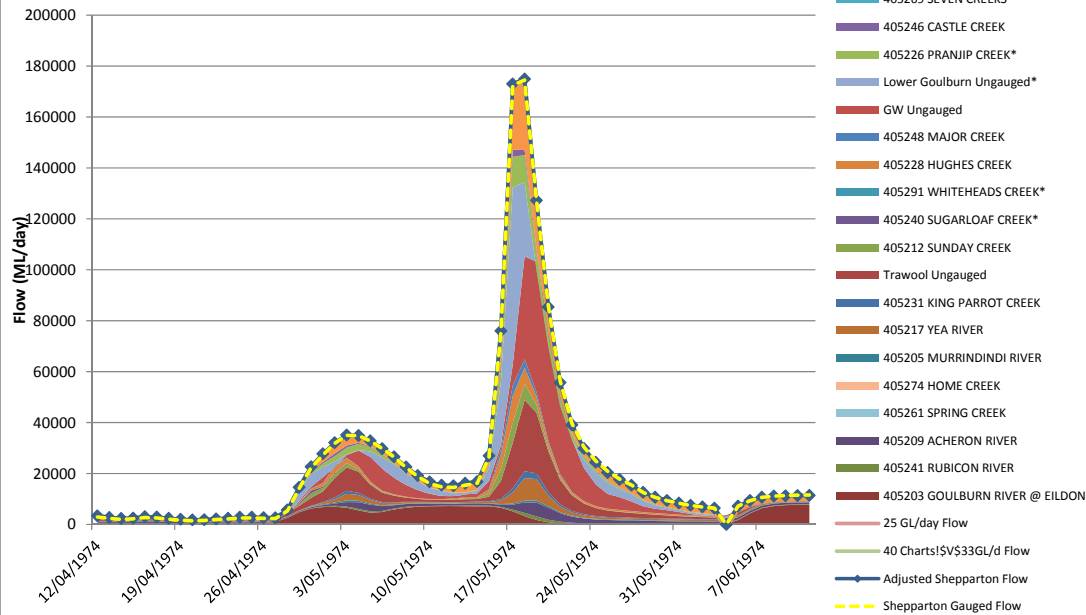




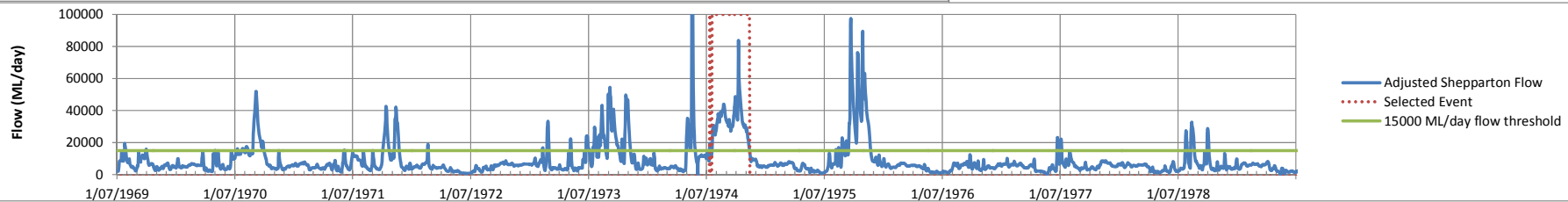
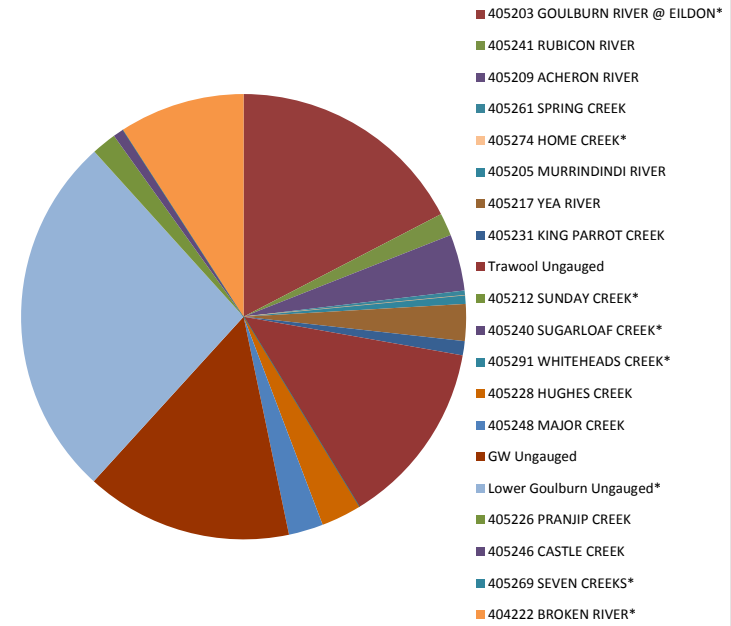
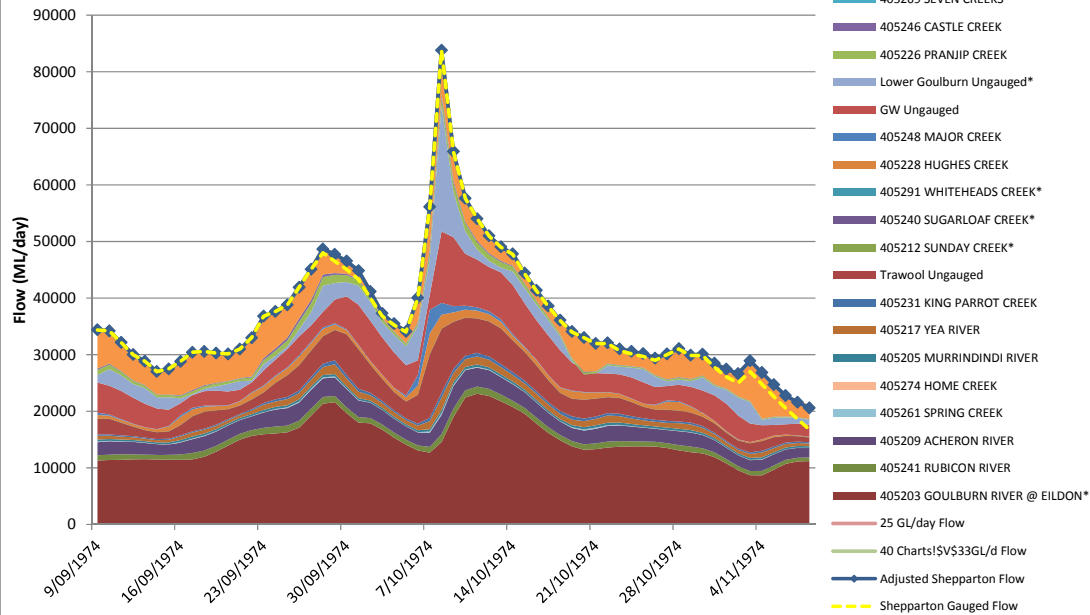
Event 45 - Peak Flow of 49634ML/day on 24/10/1973

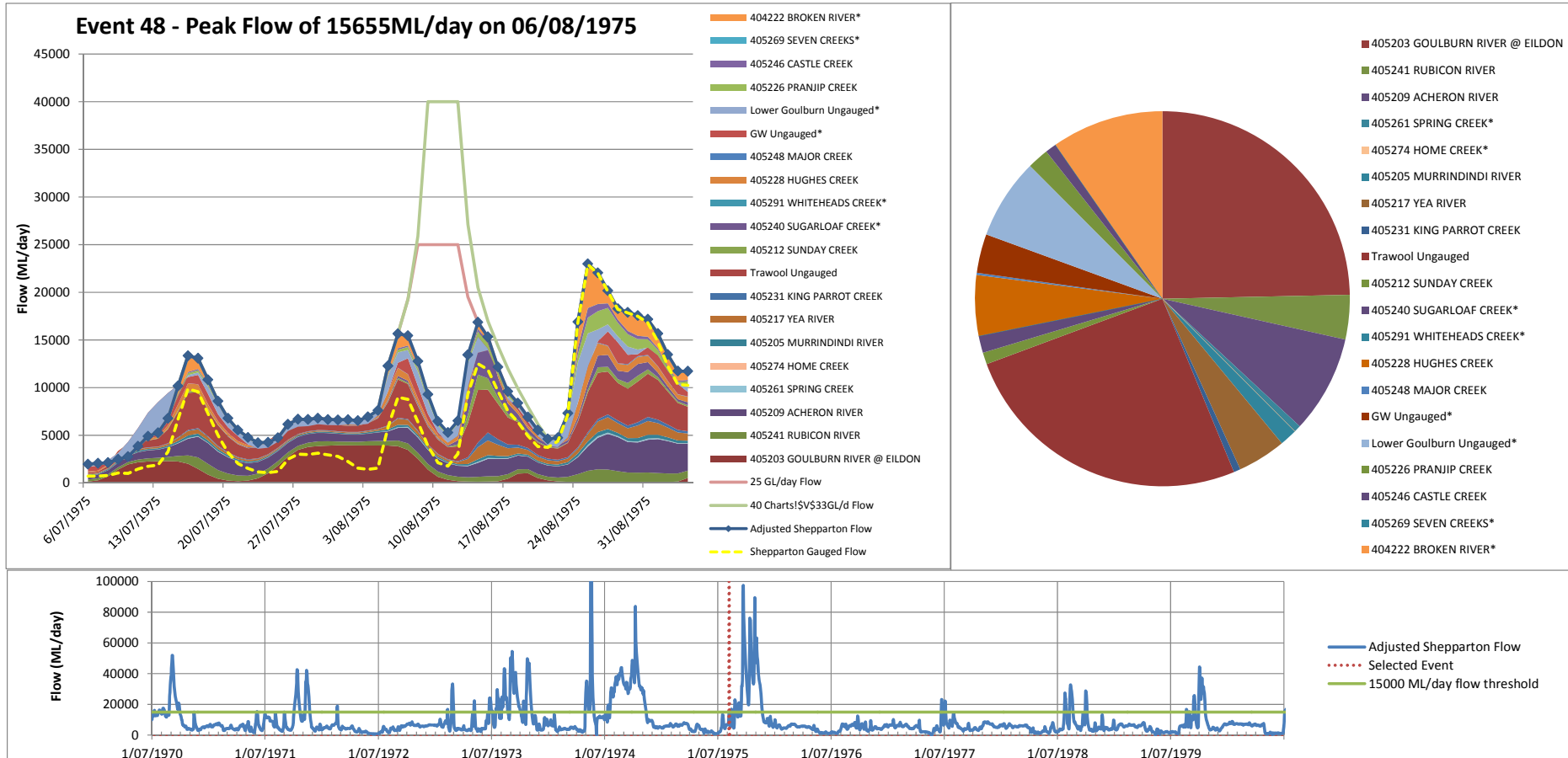


Event 46 - Peak Flow of 174863ML/day on 18/05/1974

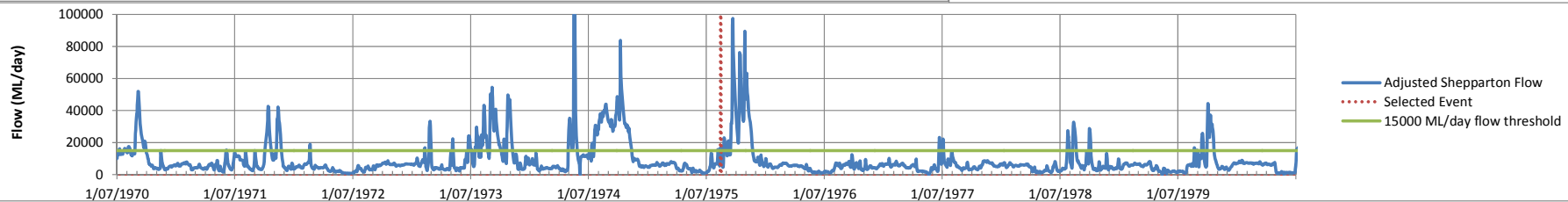
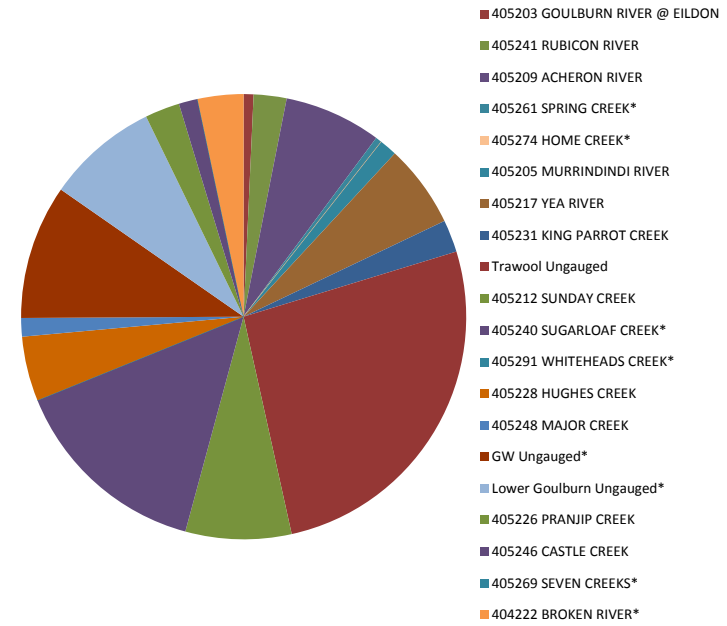
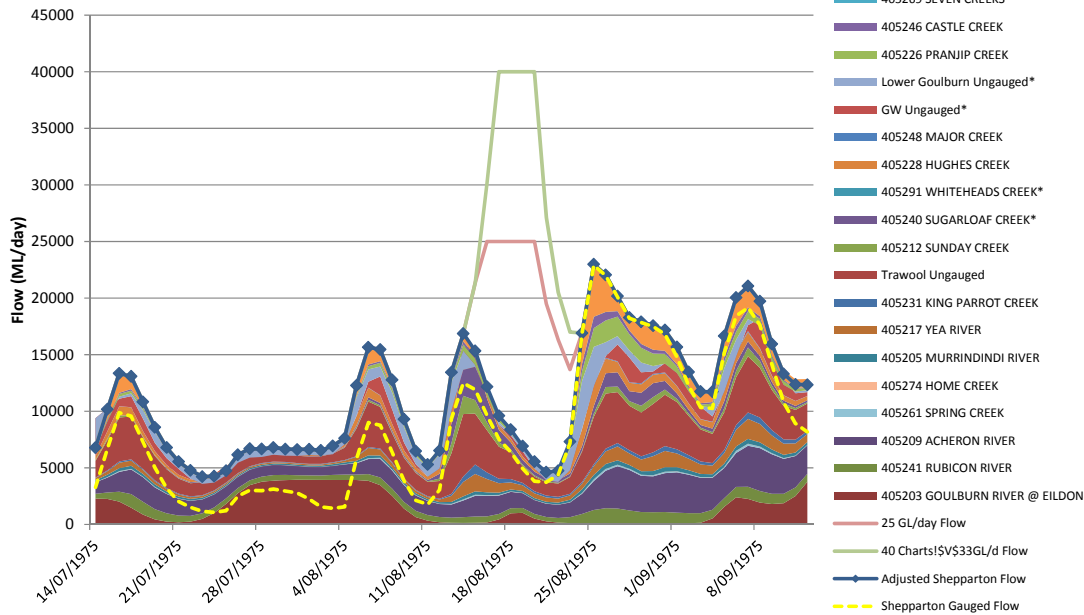


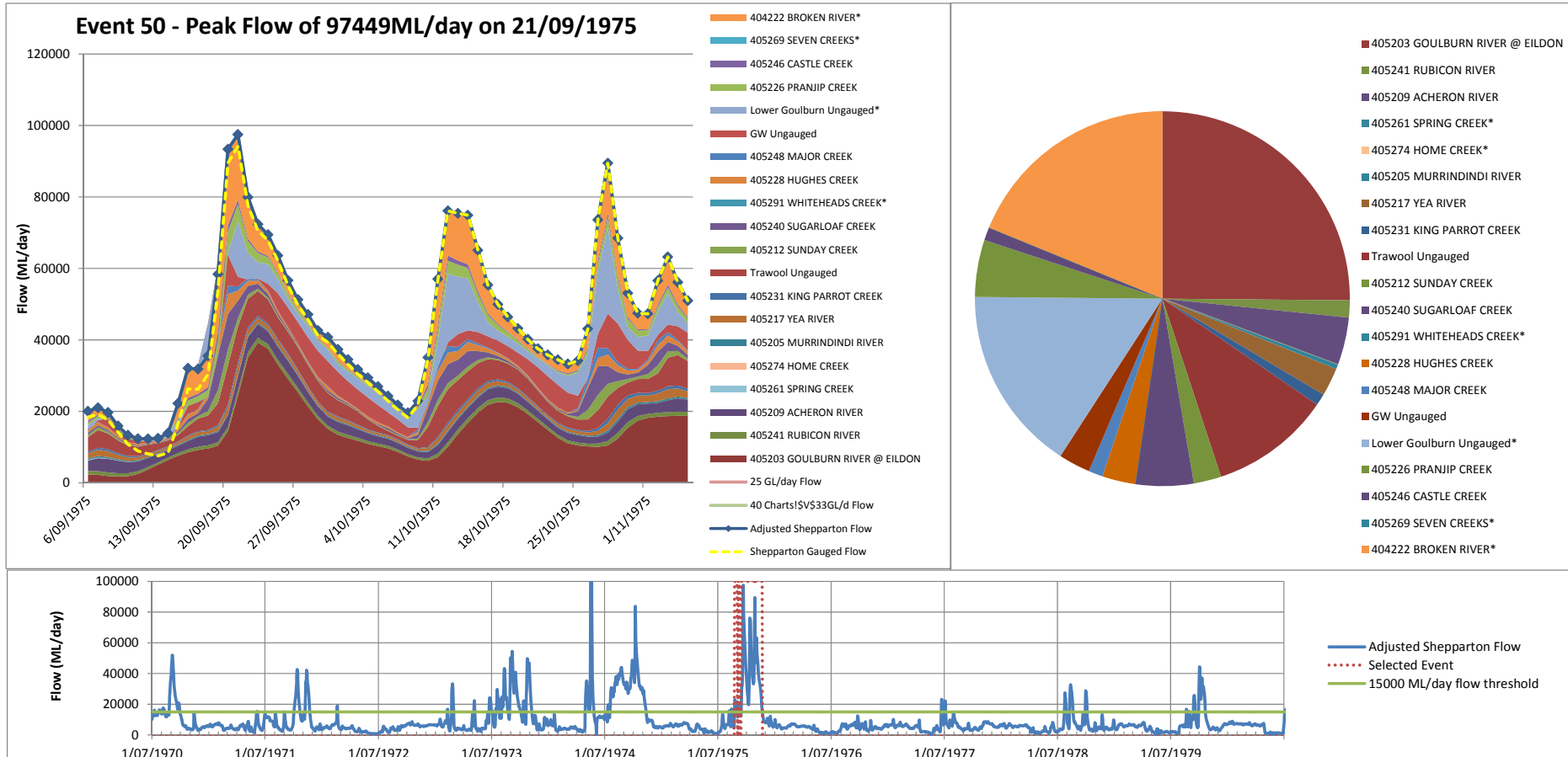
Event 47 - Peak Flow of 83806ML/day on 08/10/1974

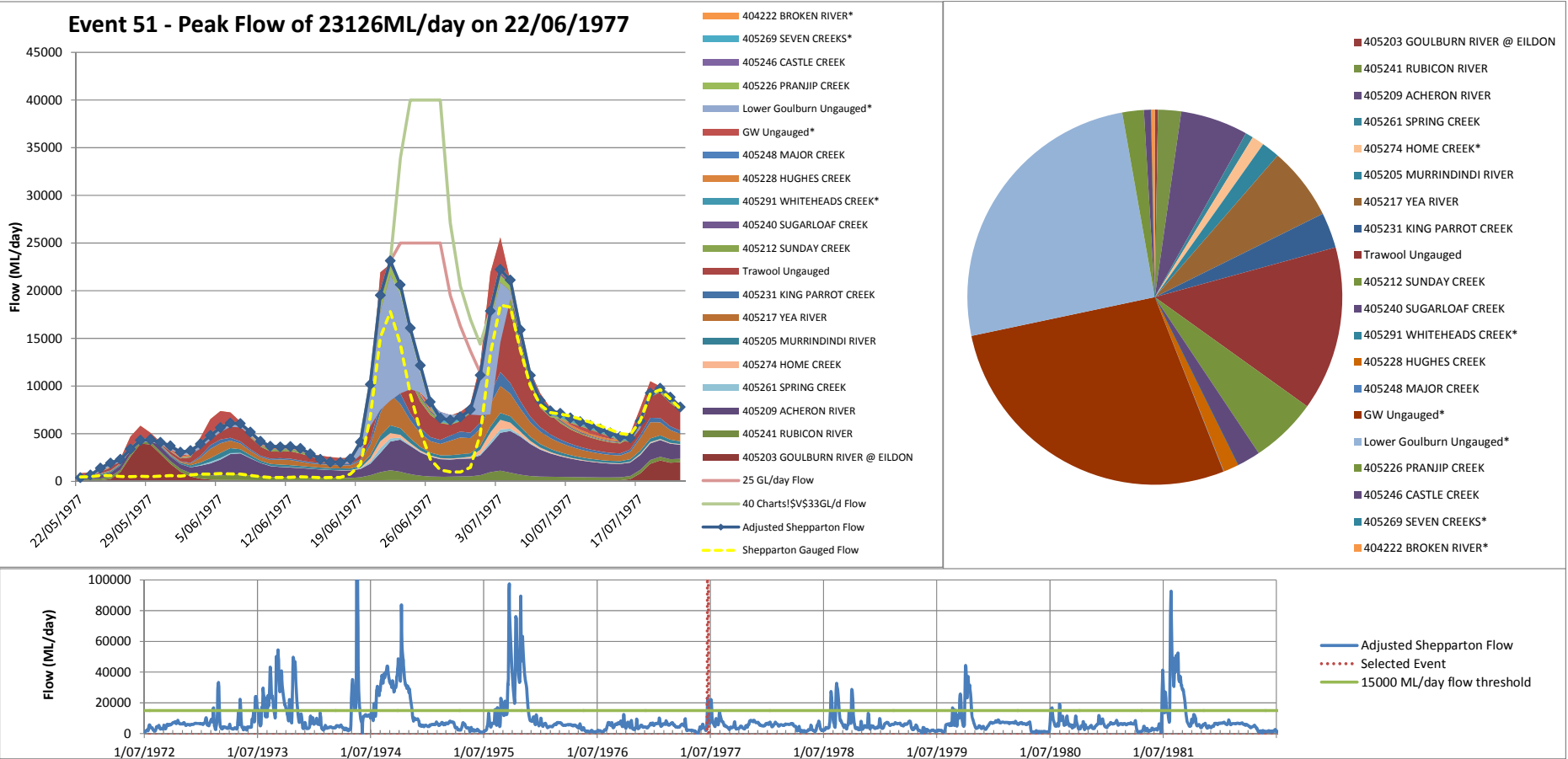




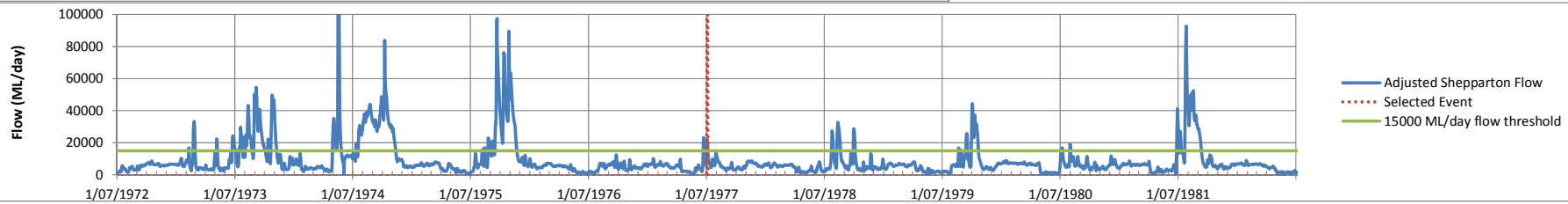
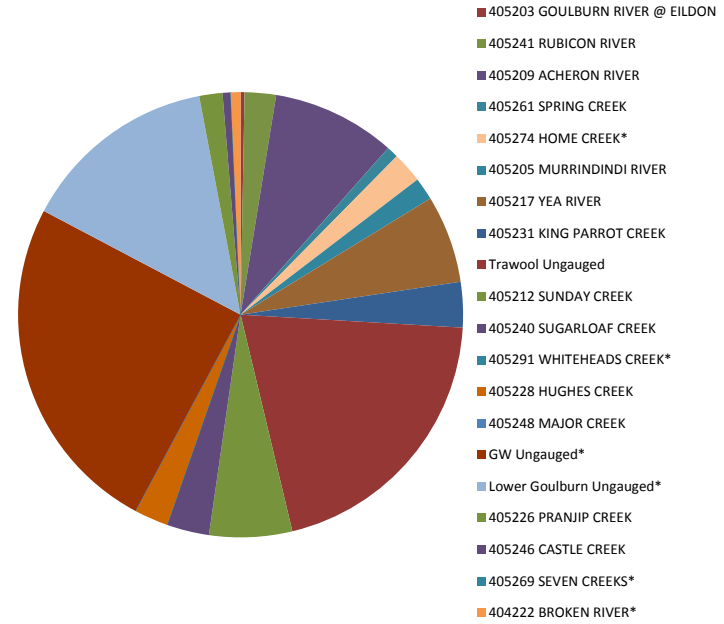
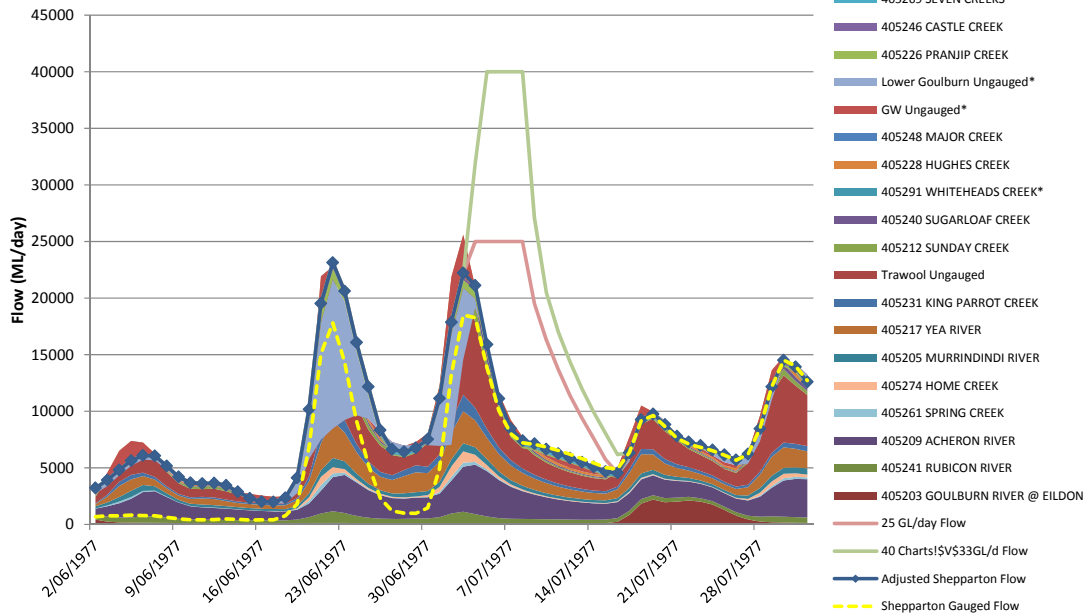
Event 49 - Peak Flow of 16872ML/day on 14/08/1975

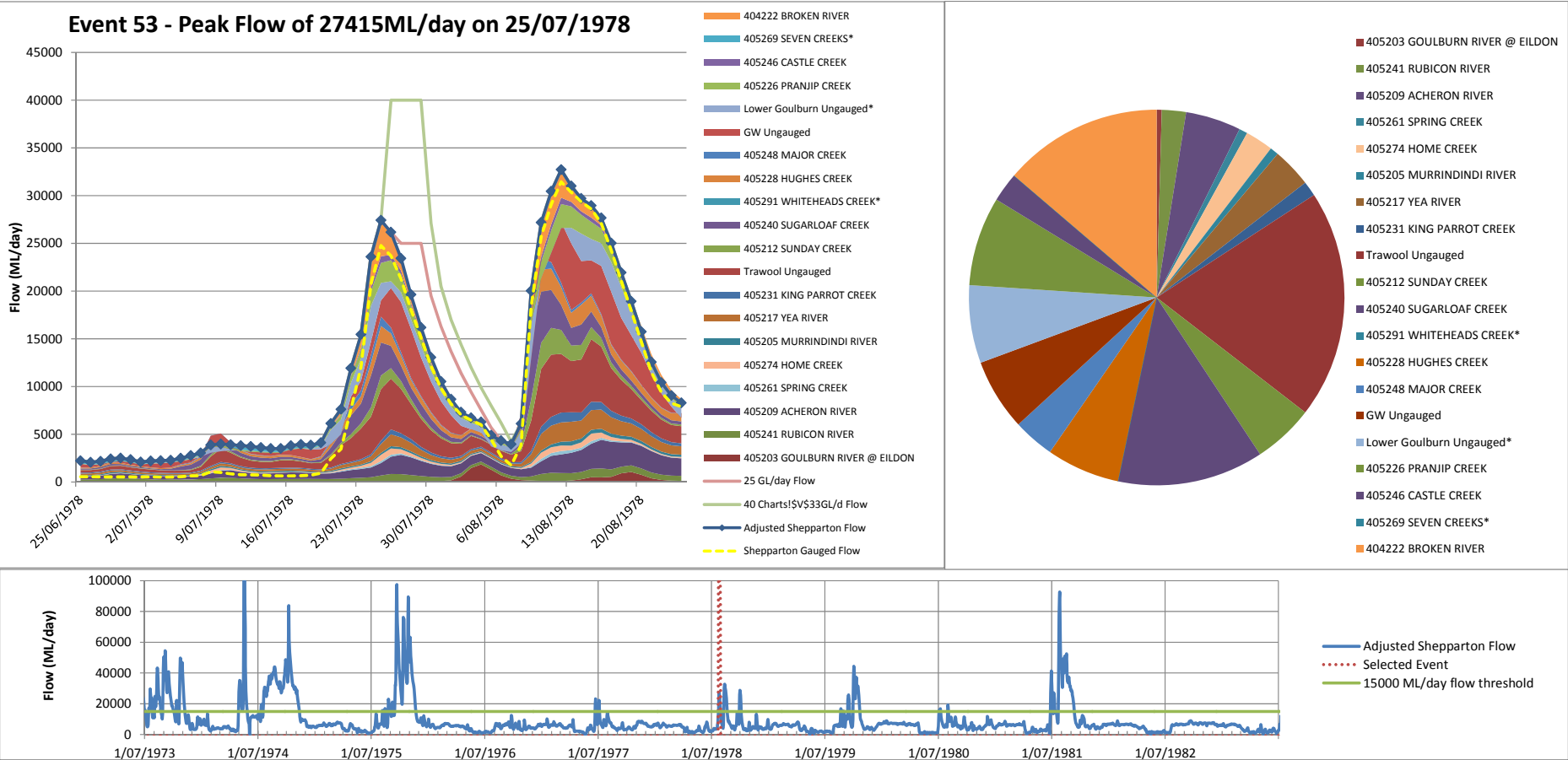


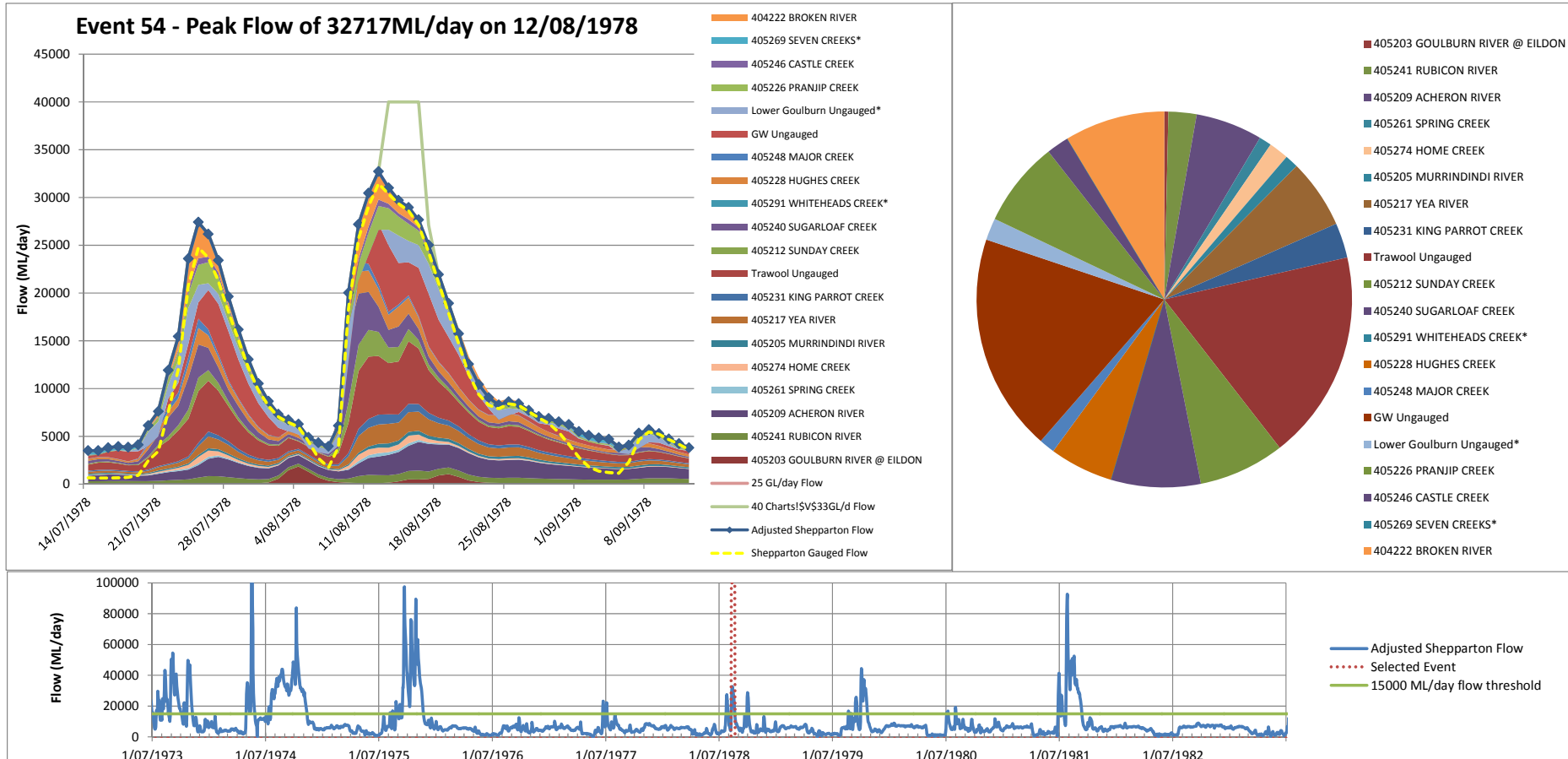


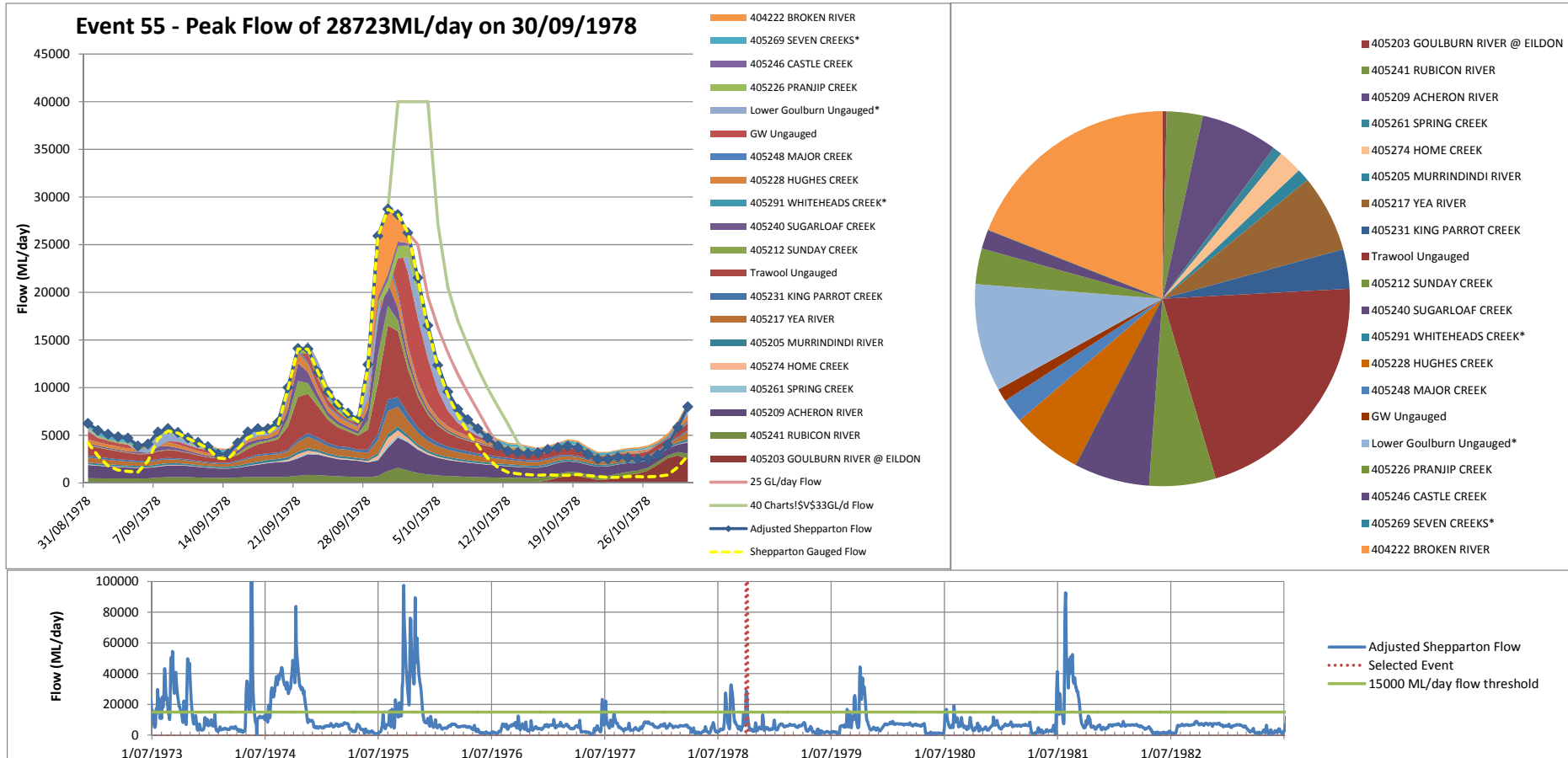


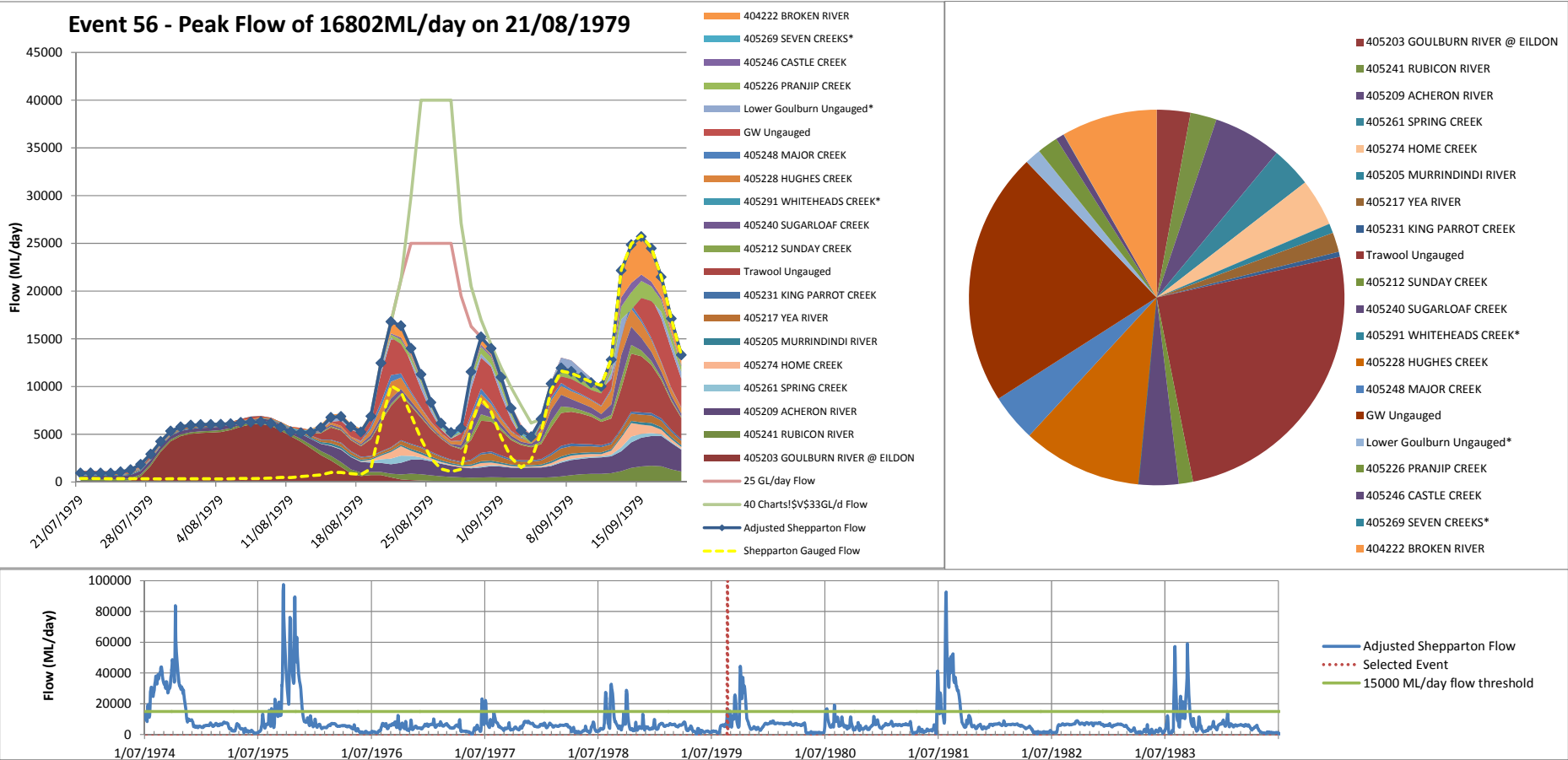
Event 52 - Peak Flow of 22221ML/day on 03/07/1977

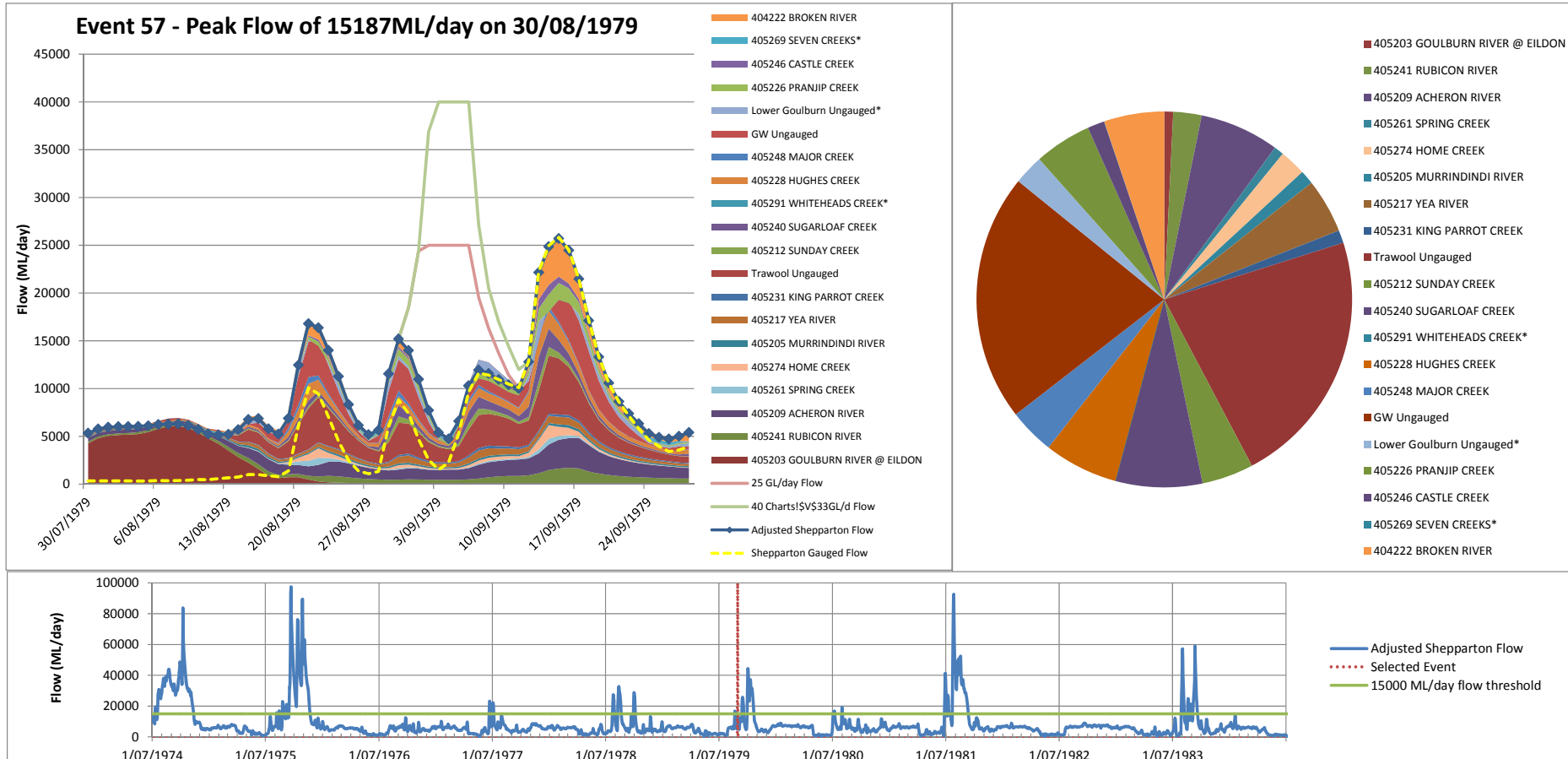


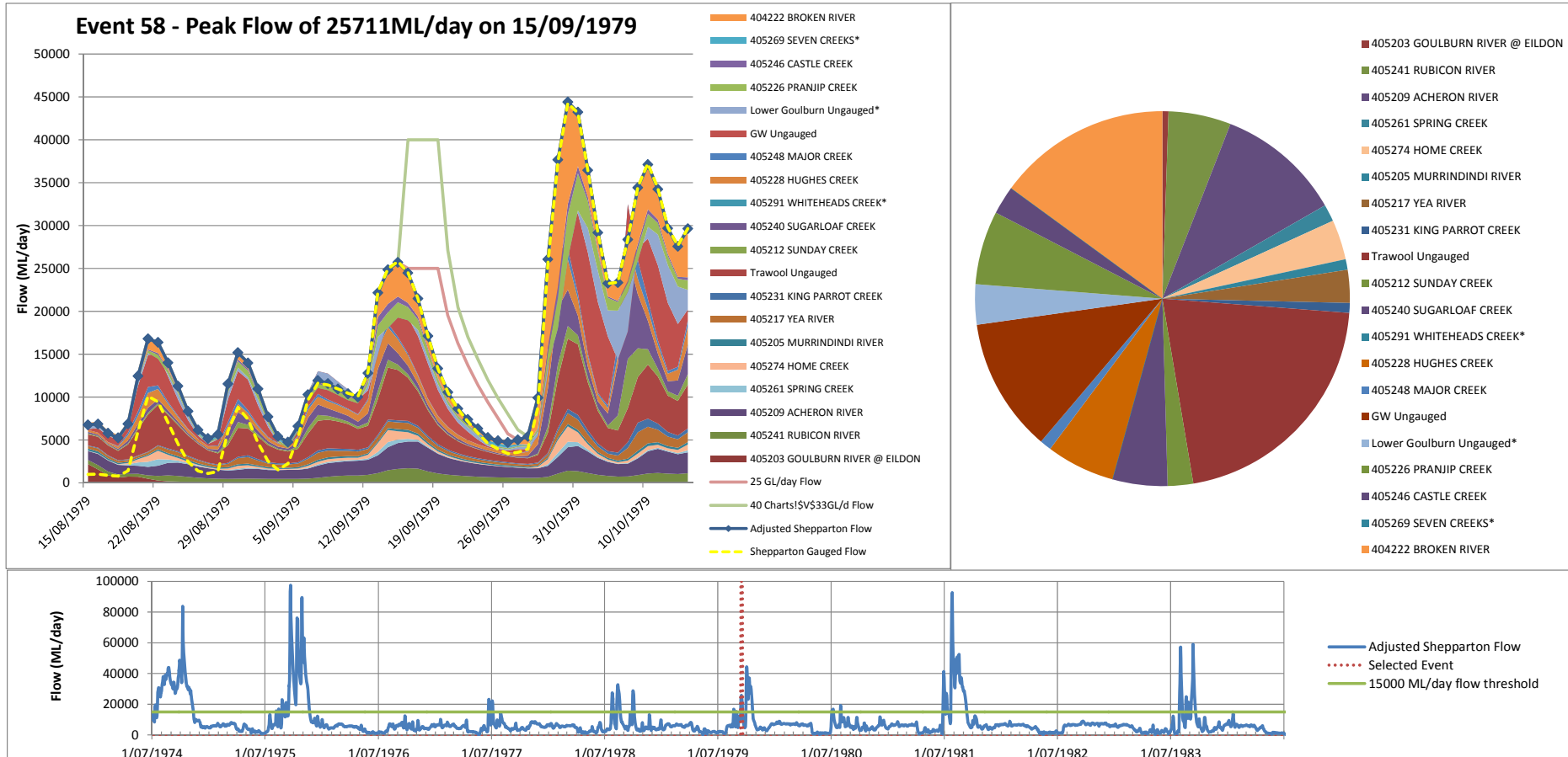


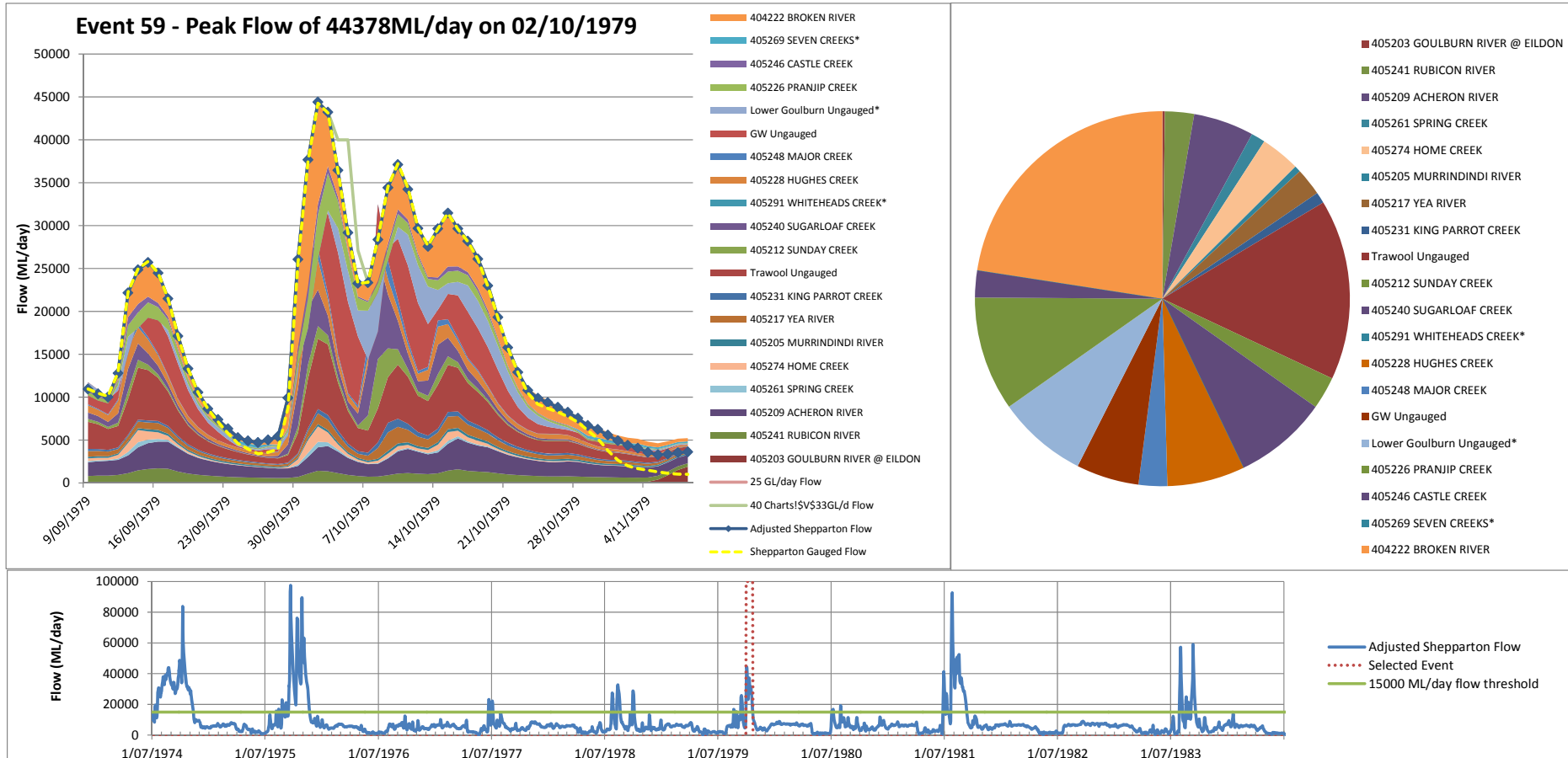


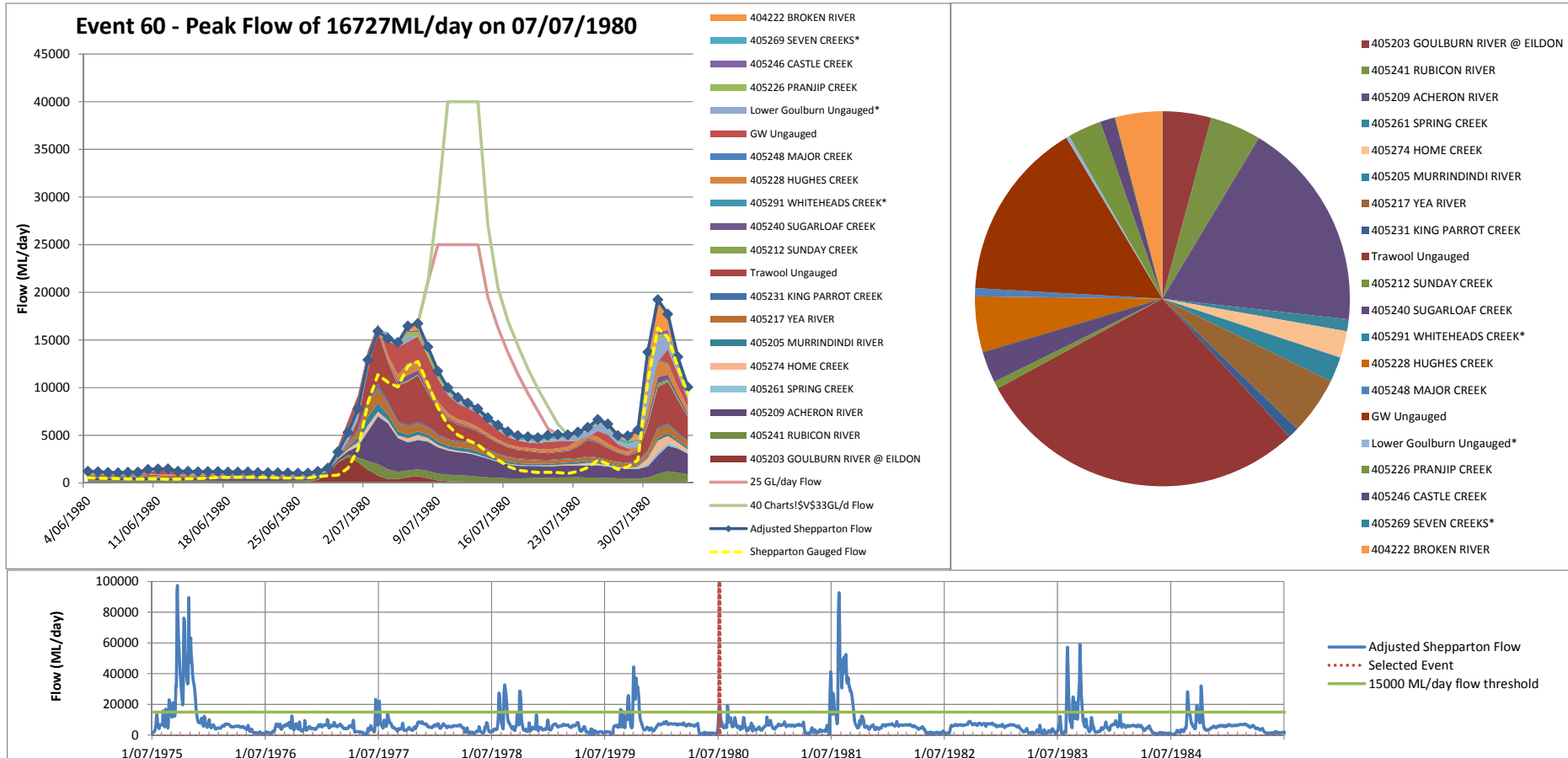




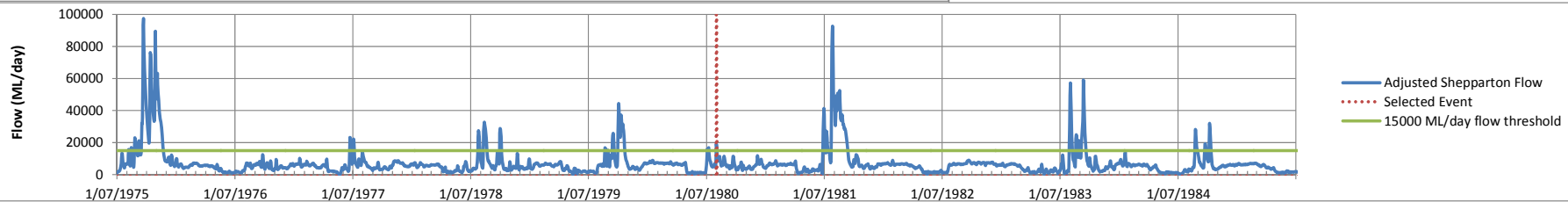
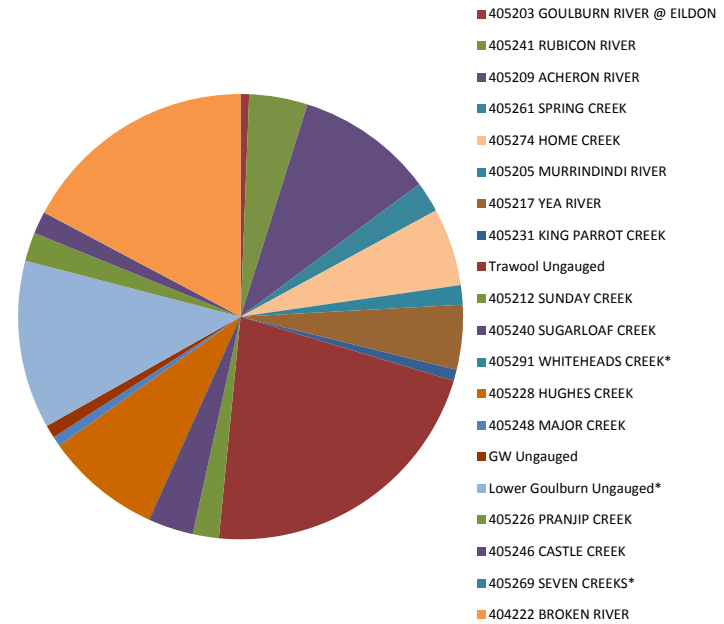
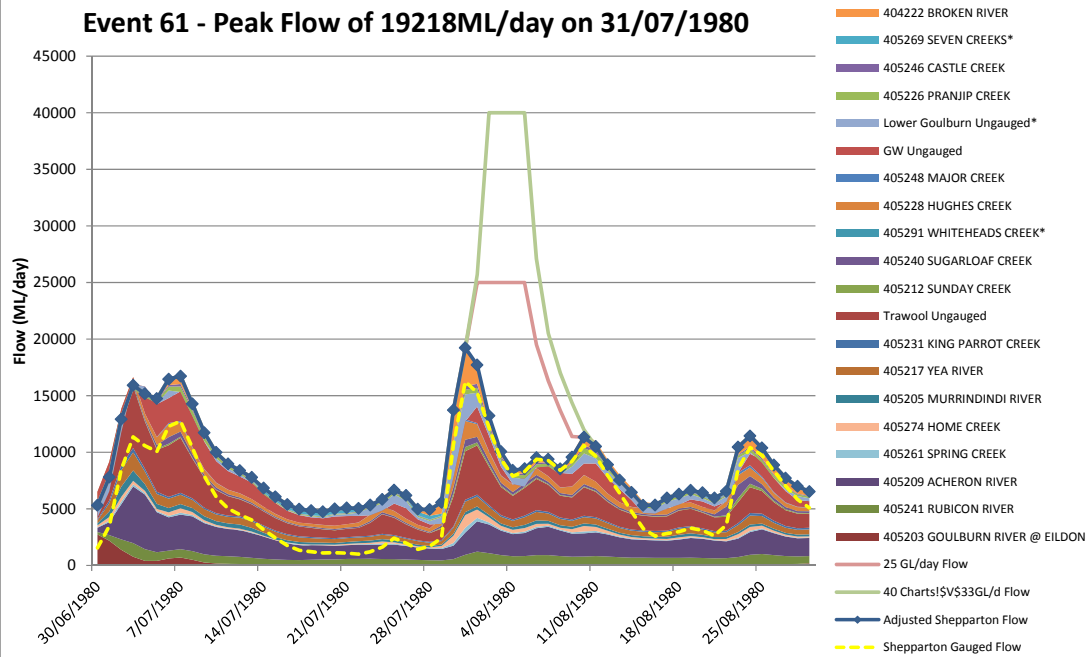


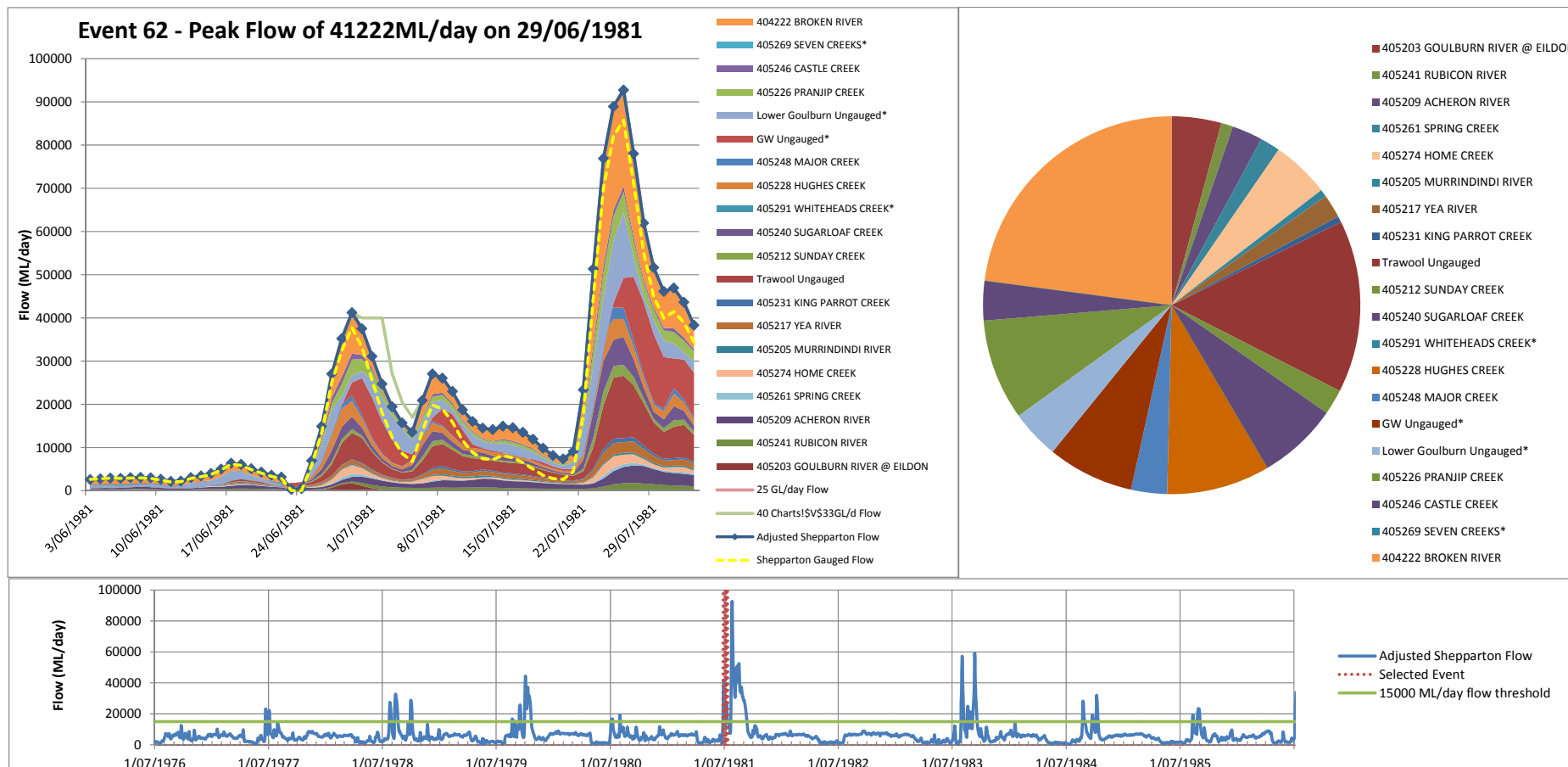


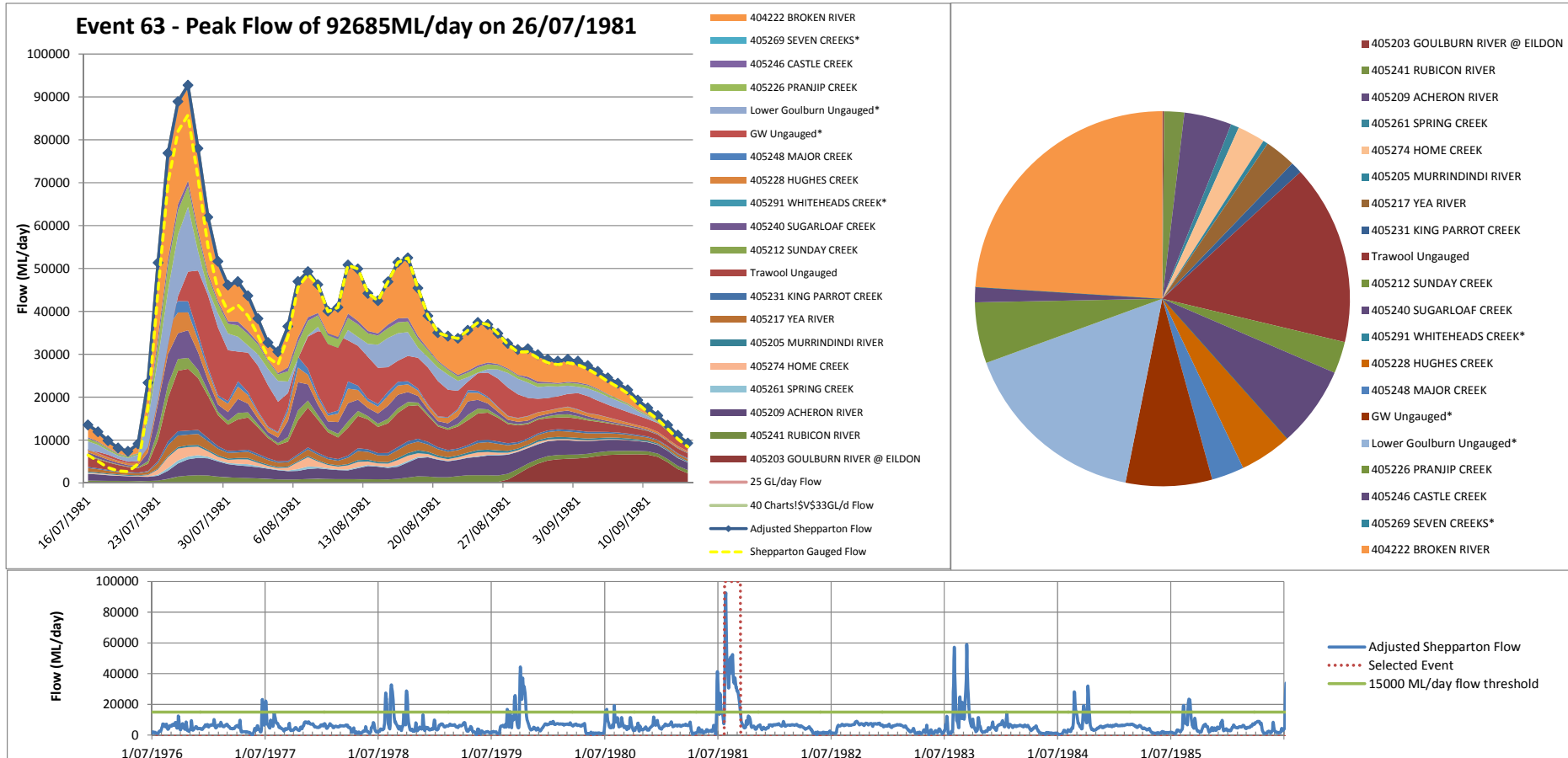


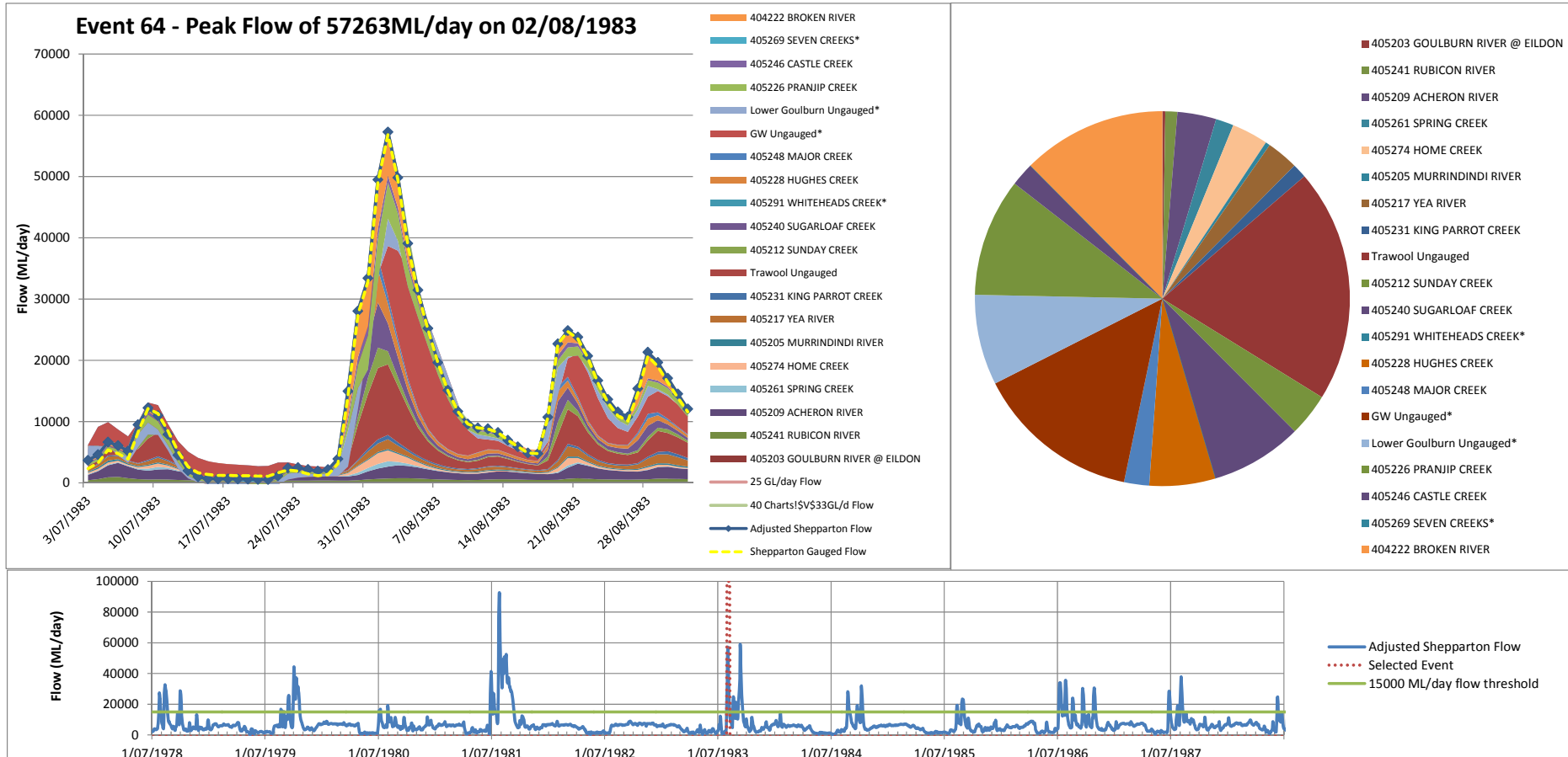


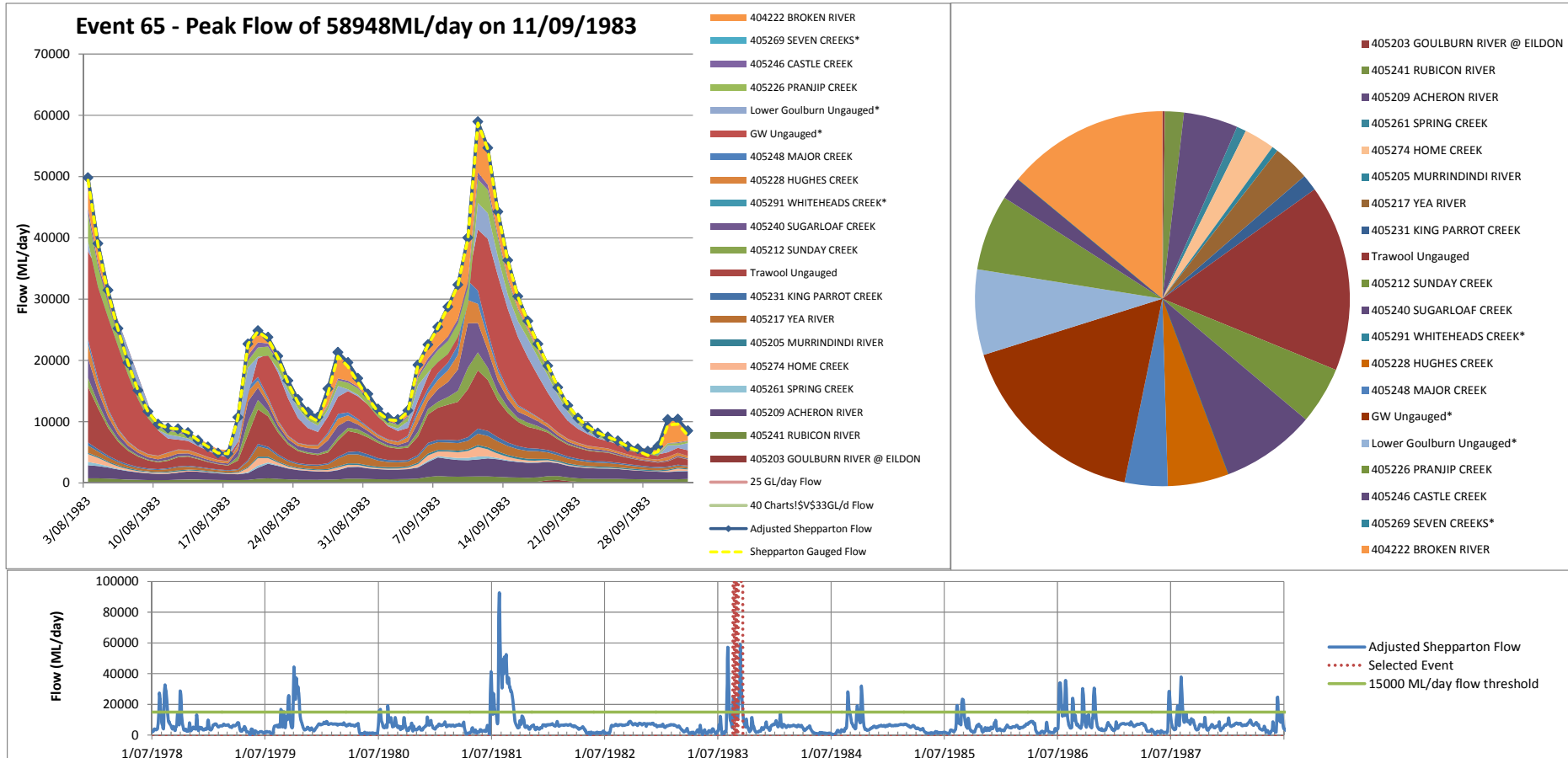
Event 61 - Peak Flow of 19218ML/day on 31/07/1980

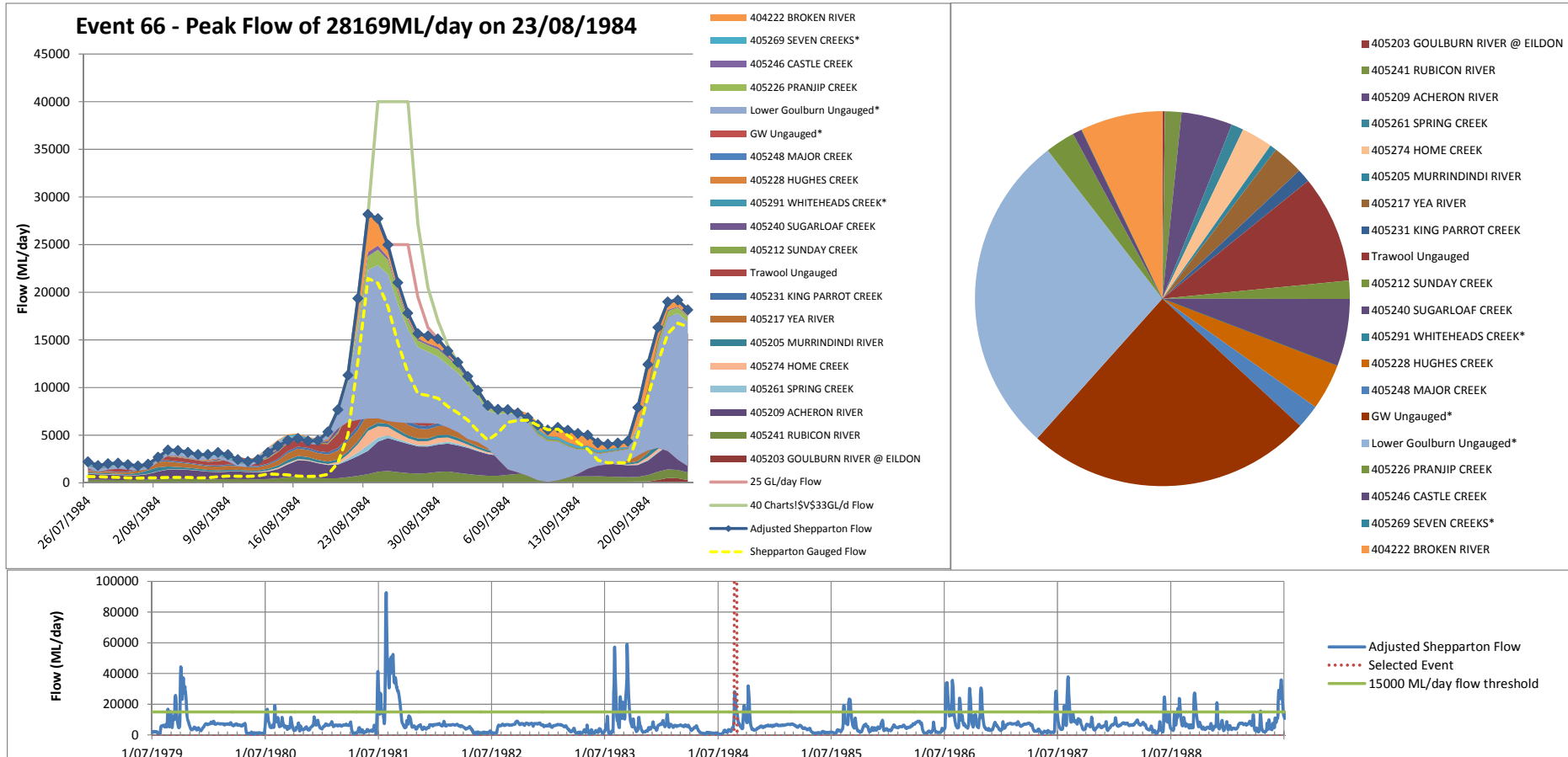


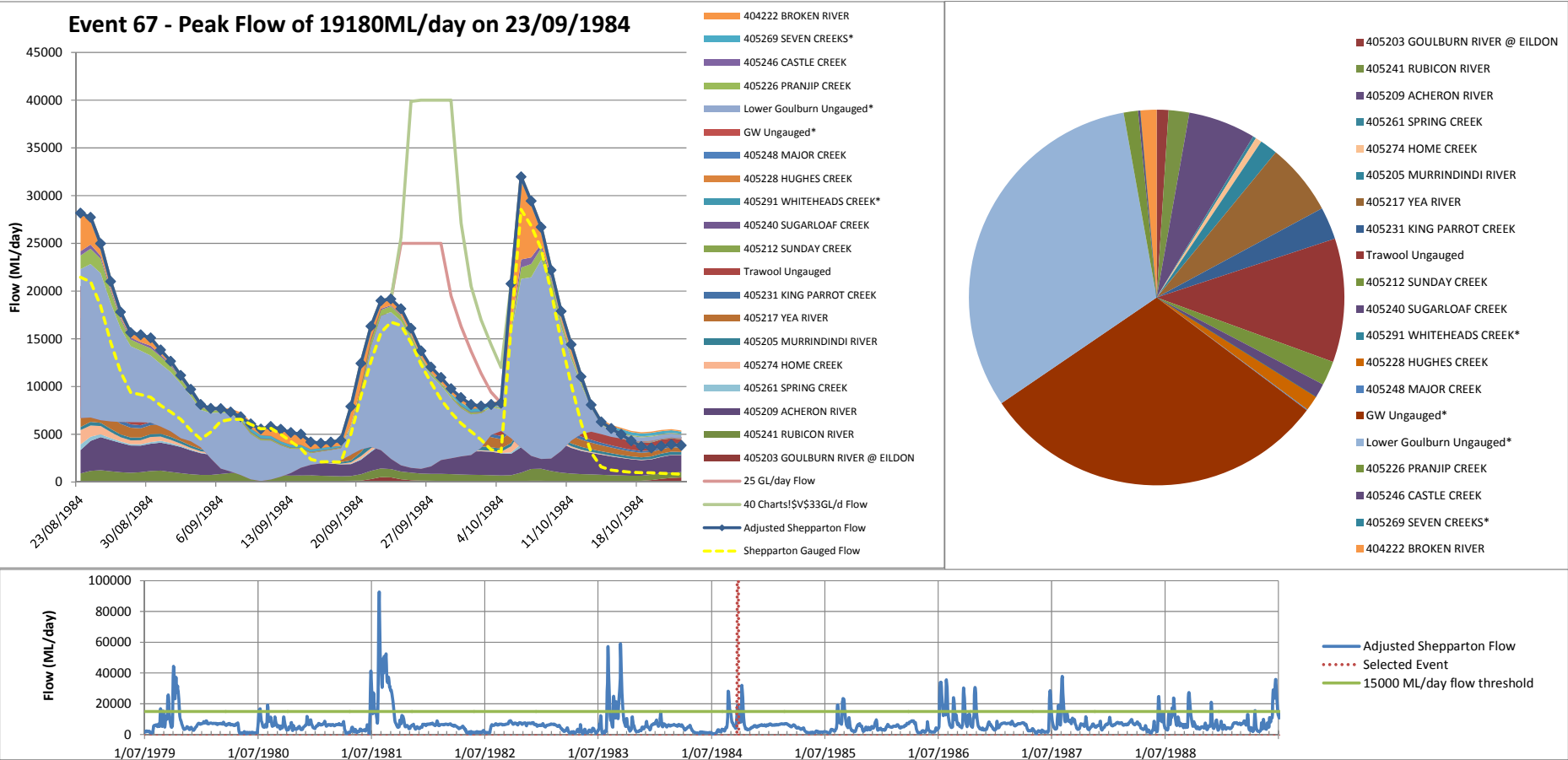




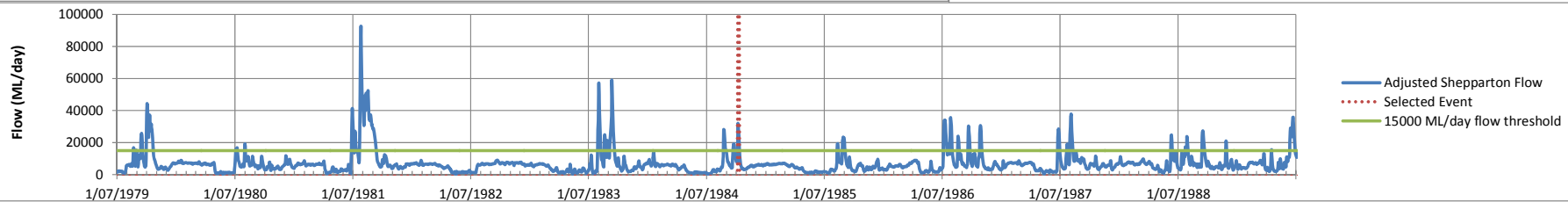
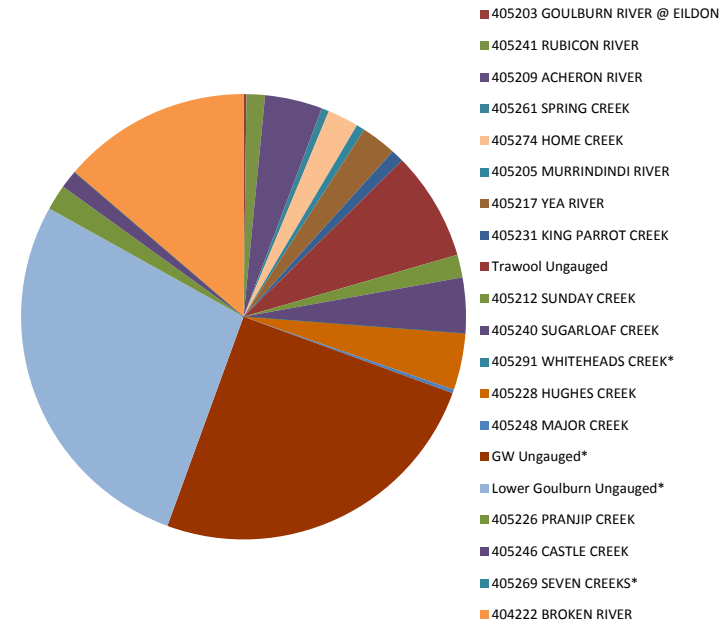
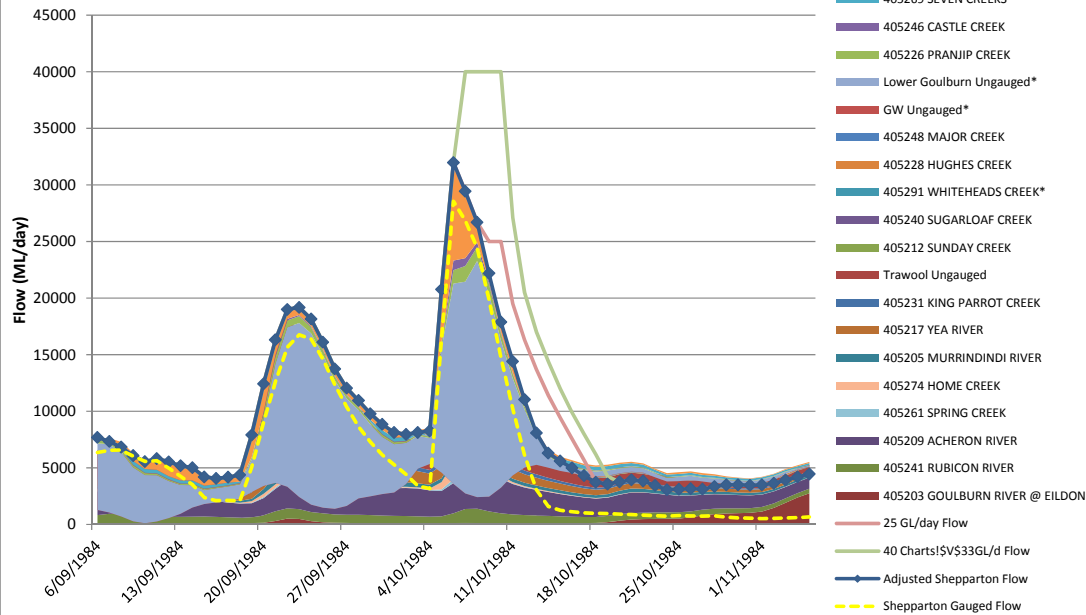


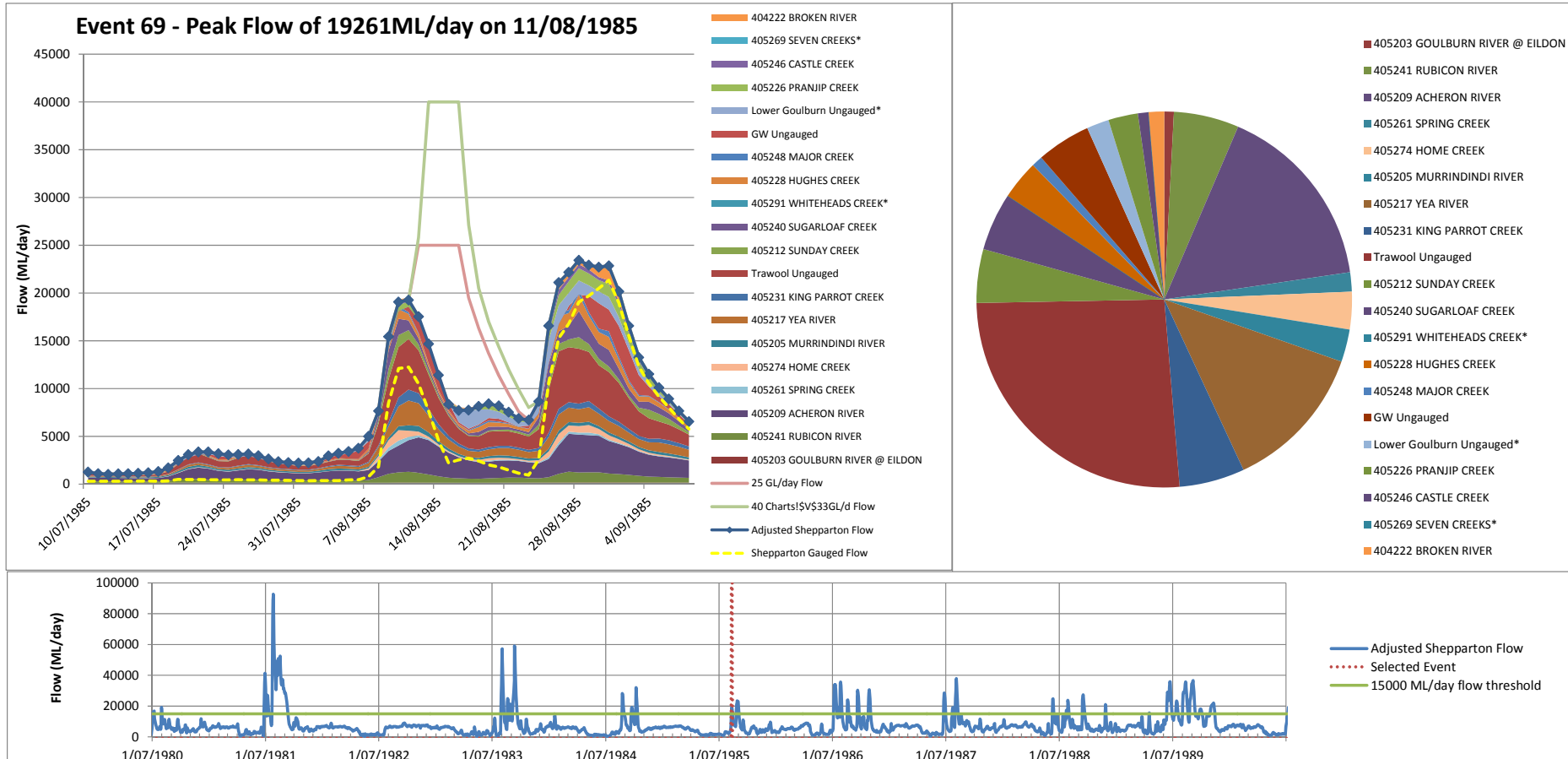




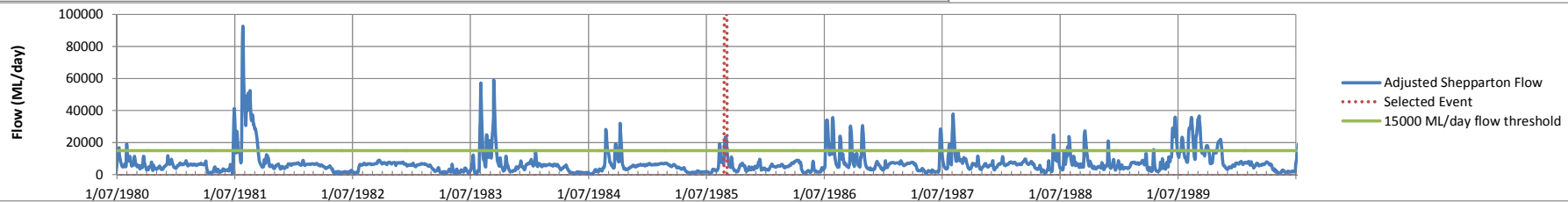
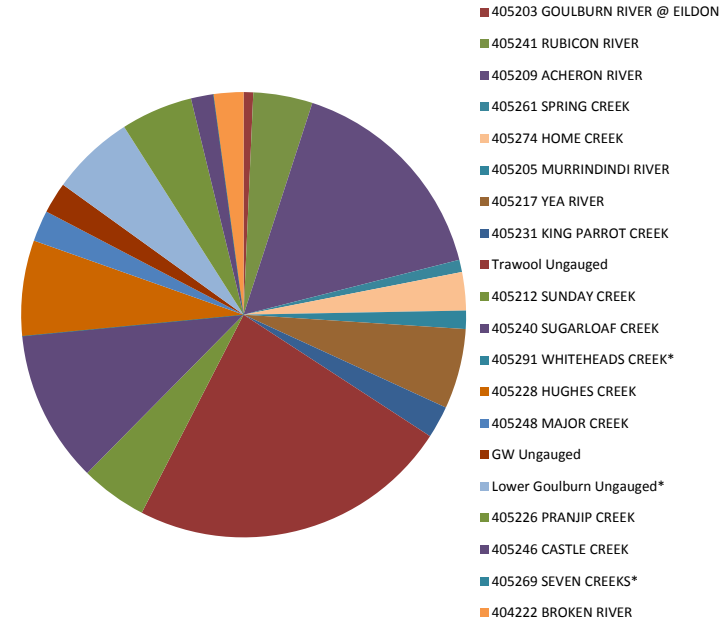
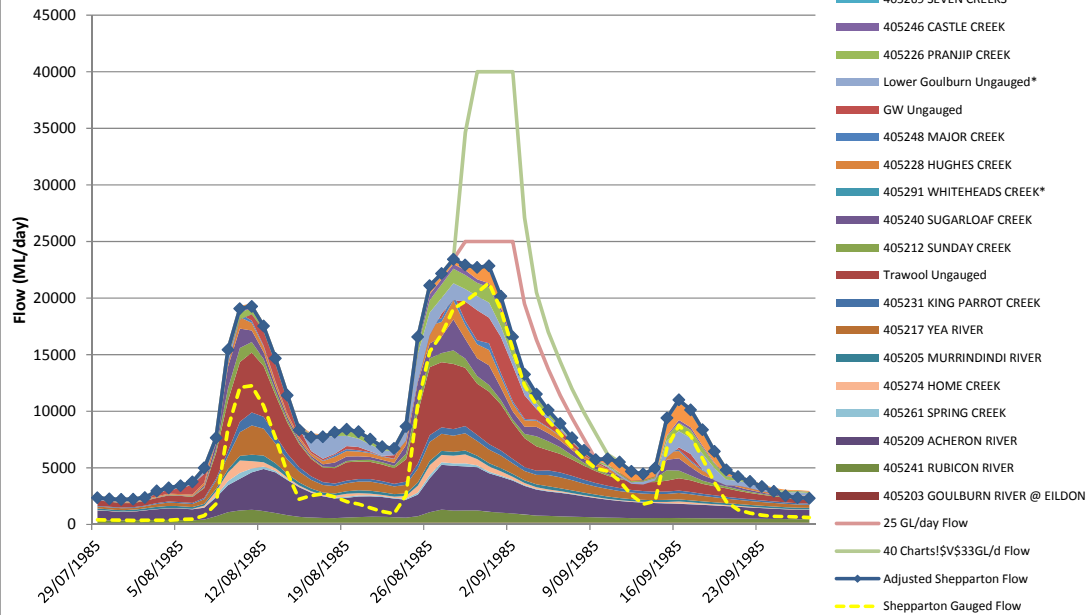


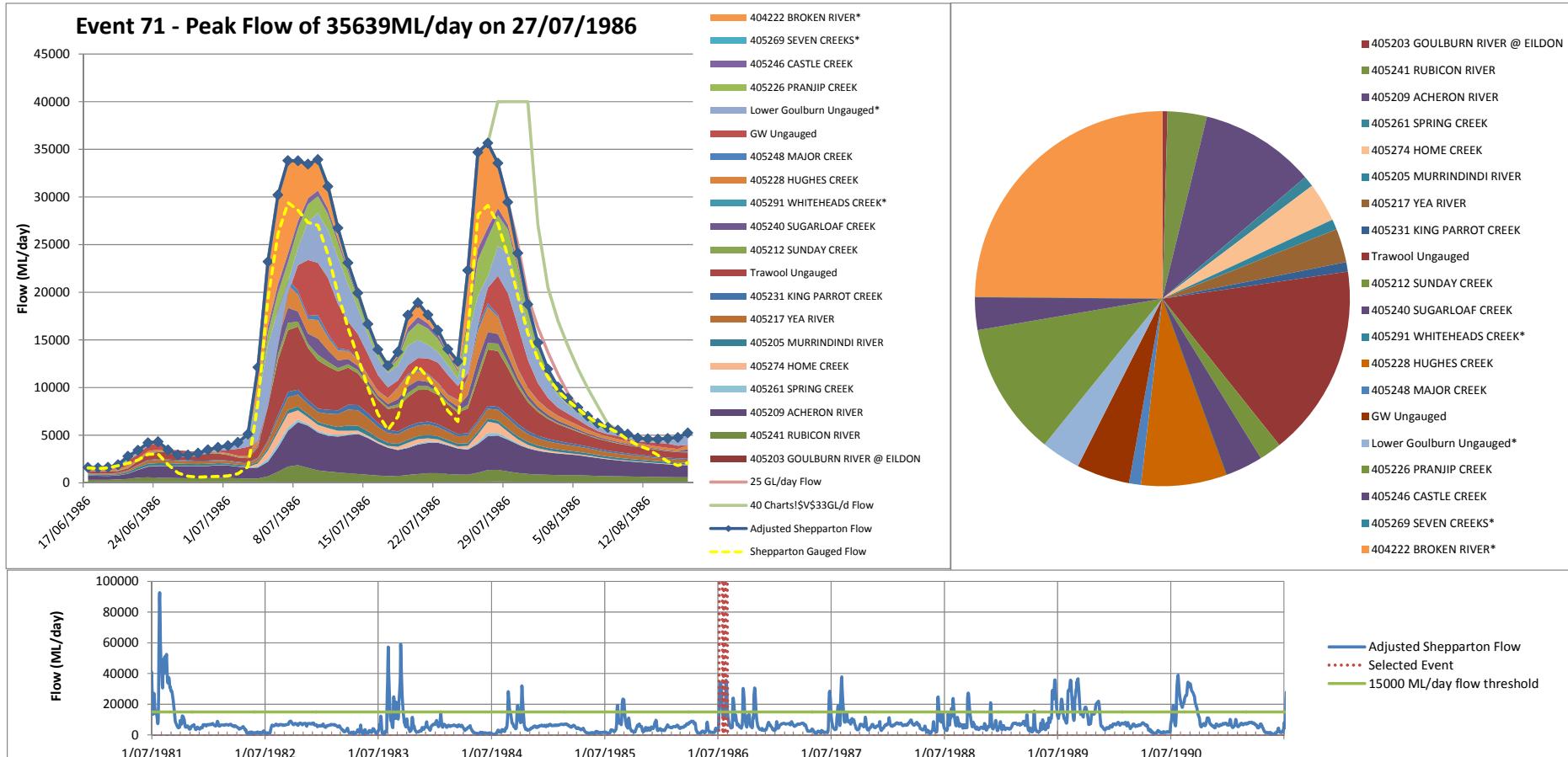
Event 68 - Peak Flow of 31978ML/day on 06/10/1984

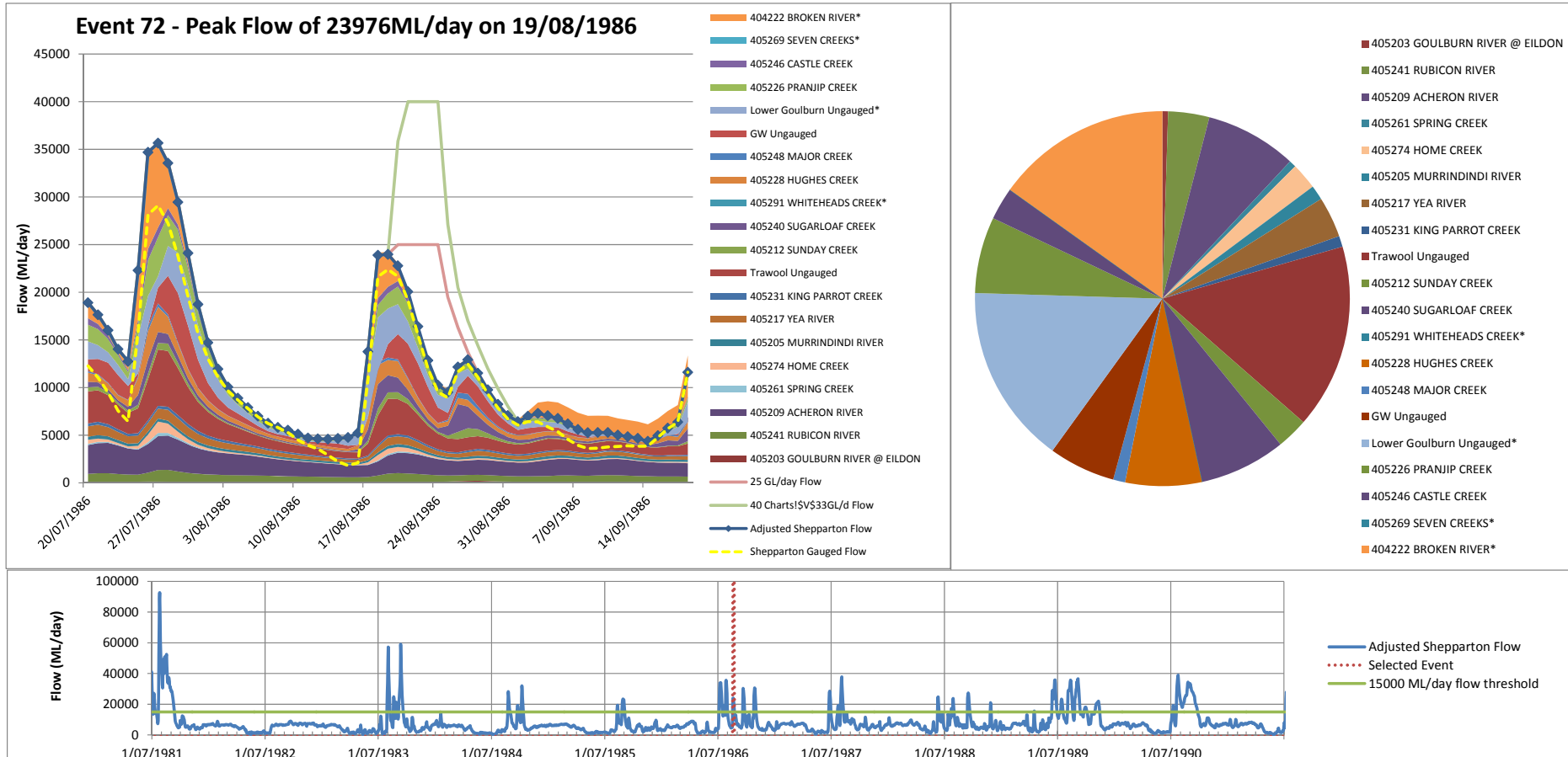




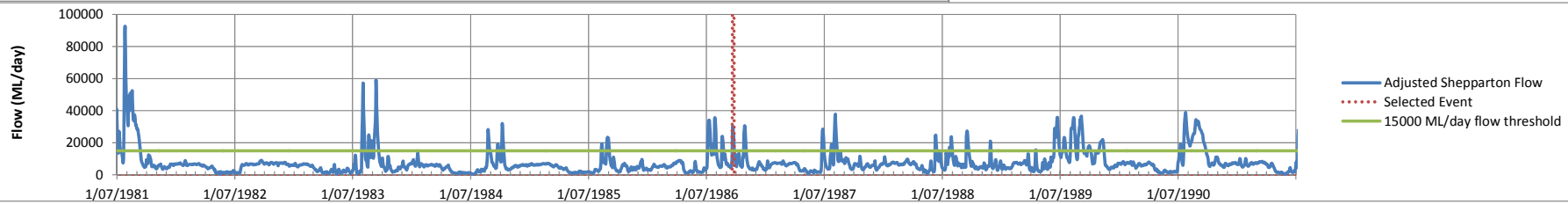
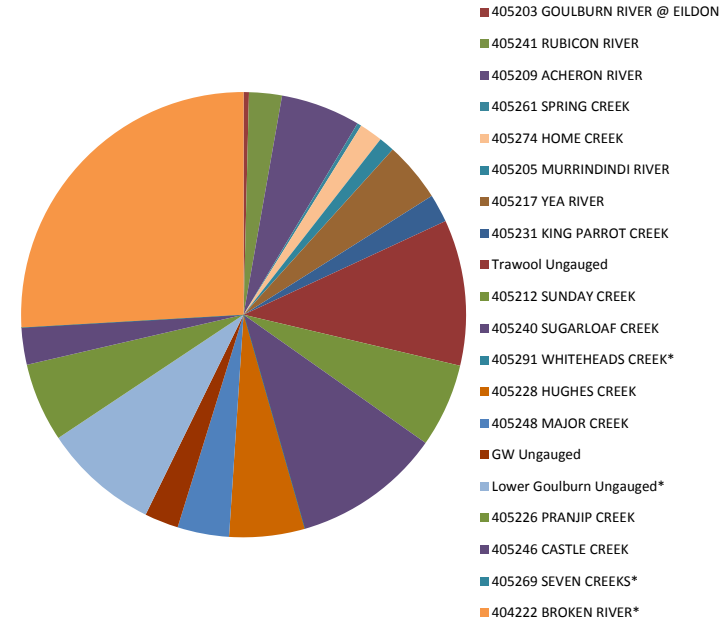
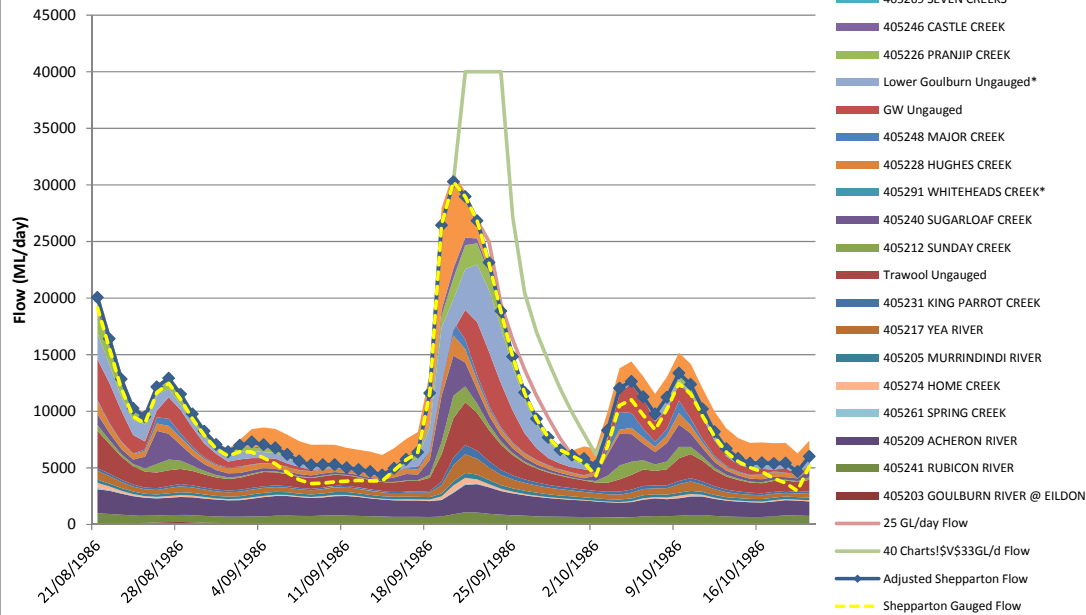
Event 70 - Peak Flow of 23427ML/day on 28/08/1985



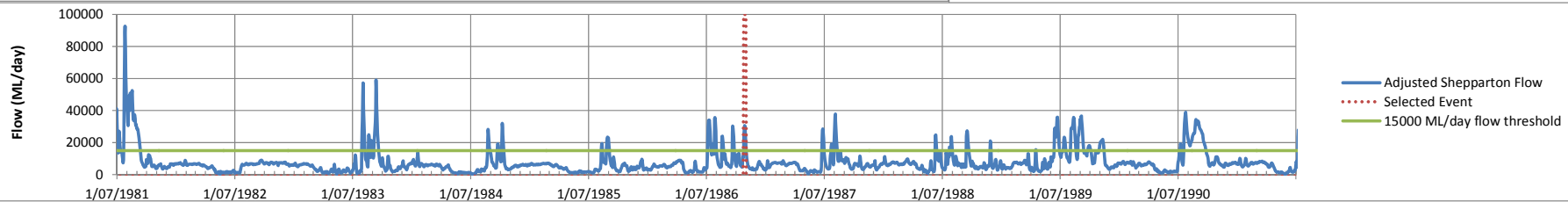
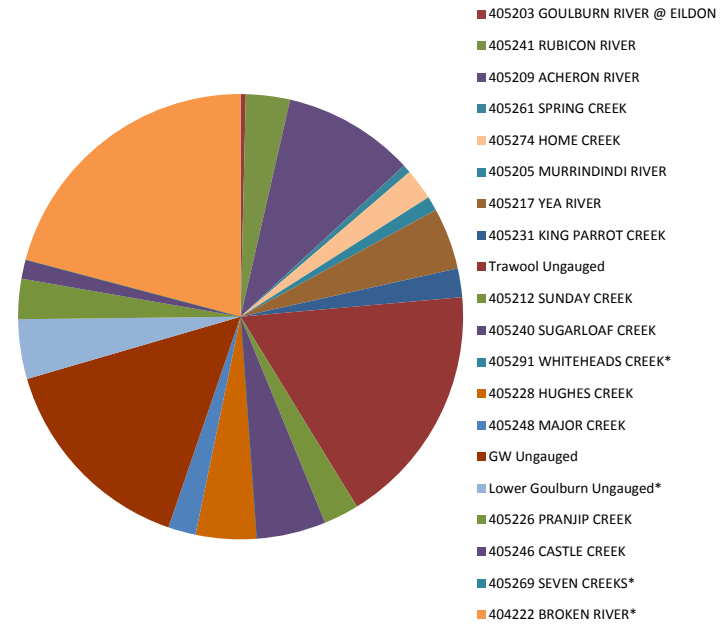
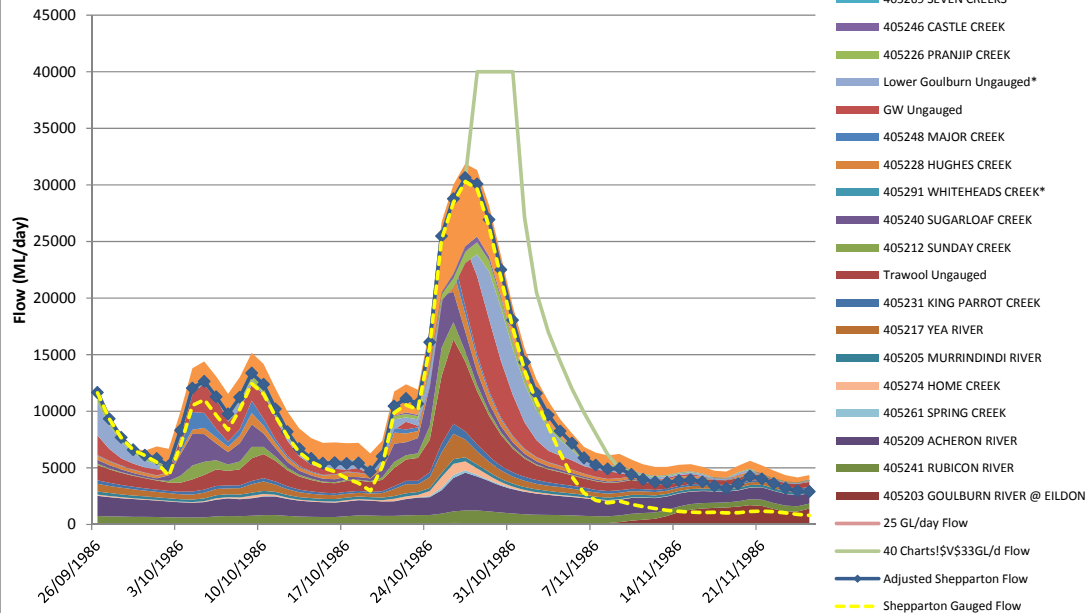


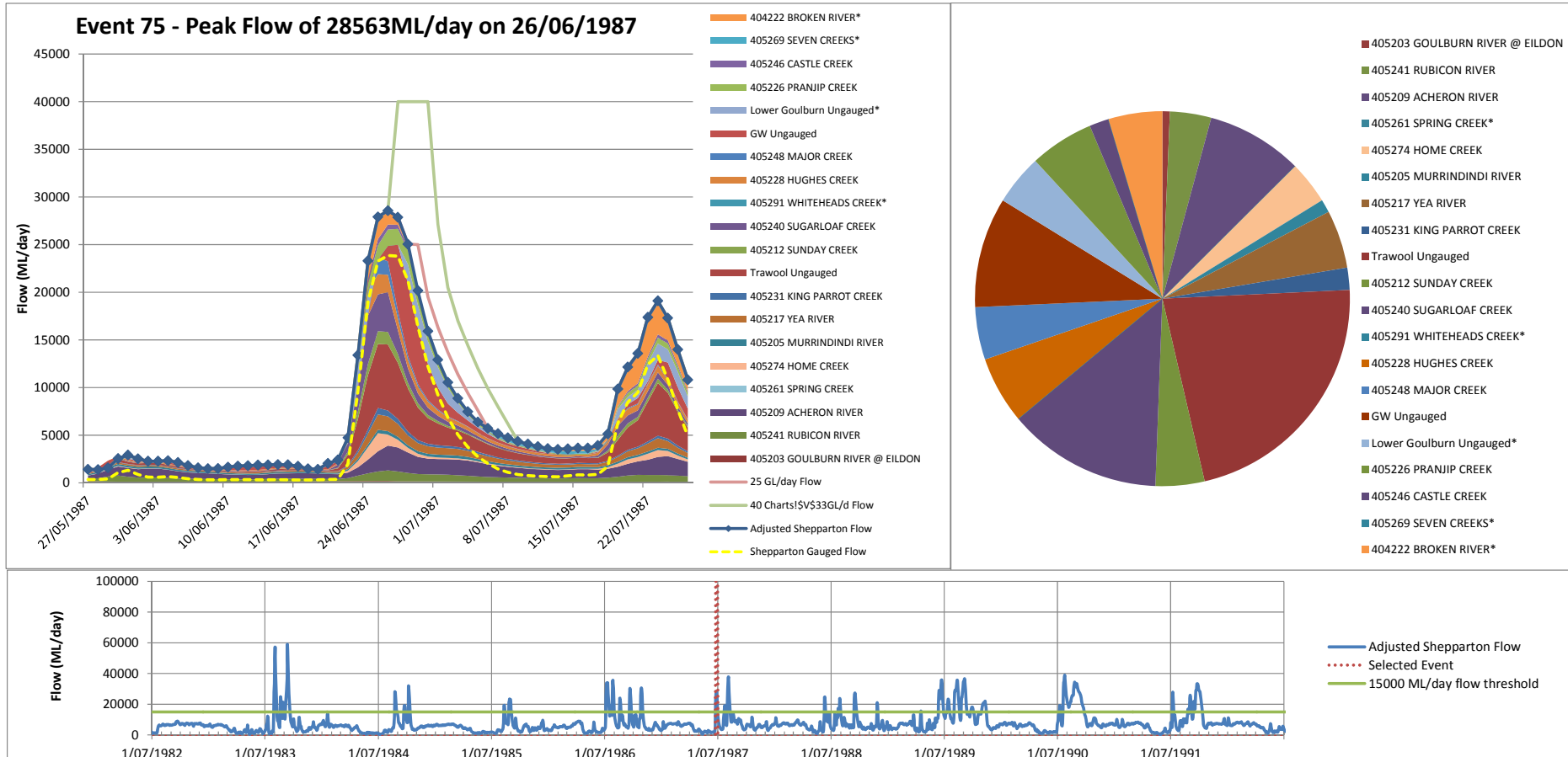


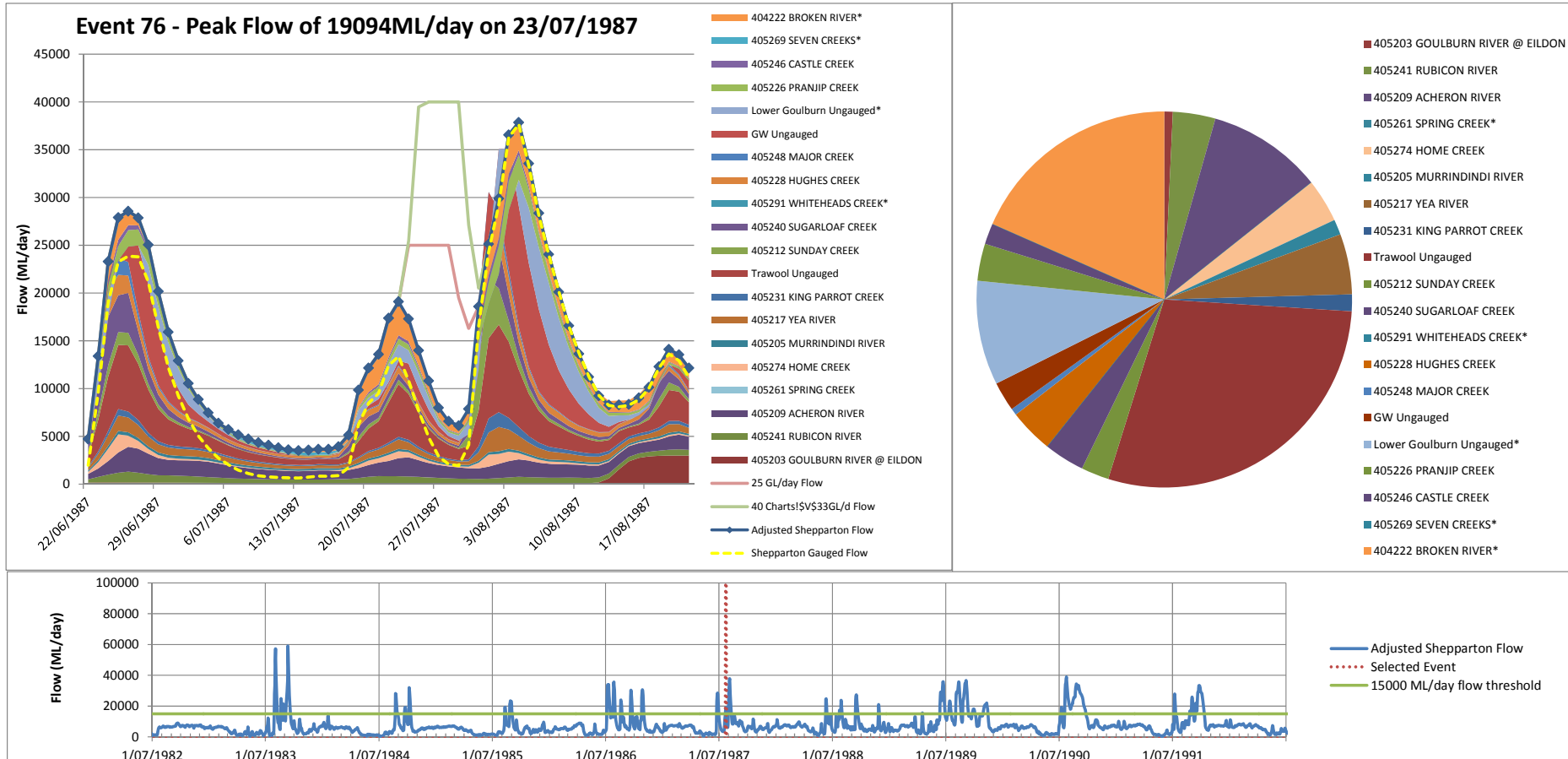
Event 73 - Peak Flow of 30266ML/day on 20/09/1986



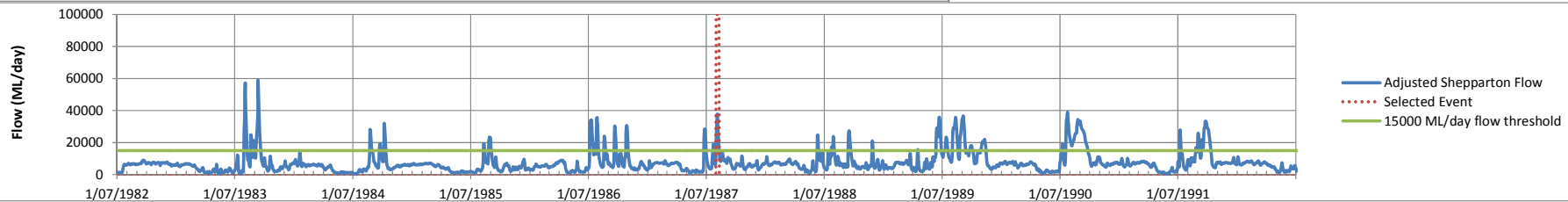
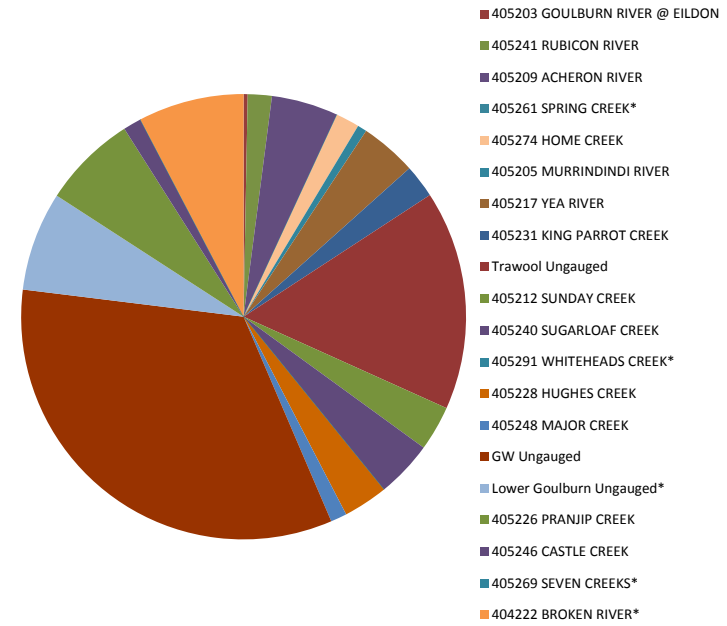
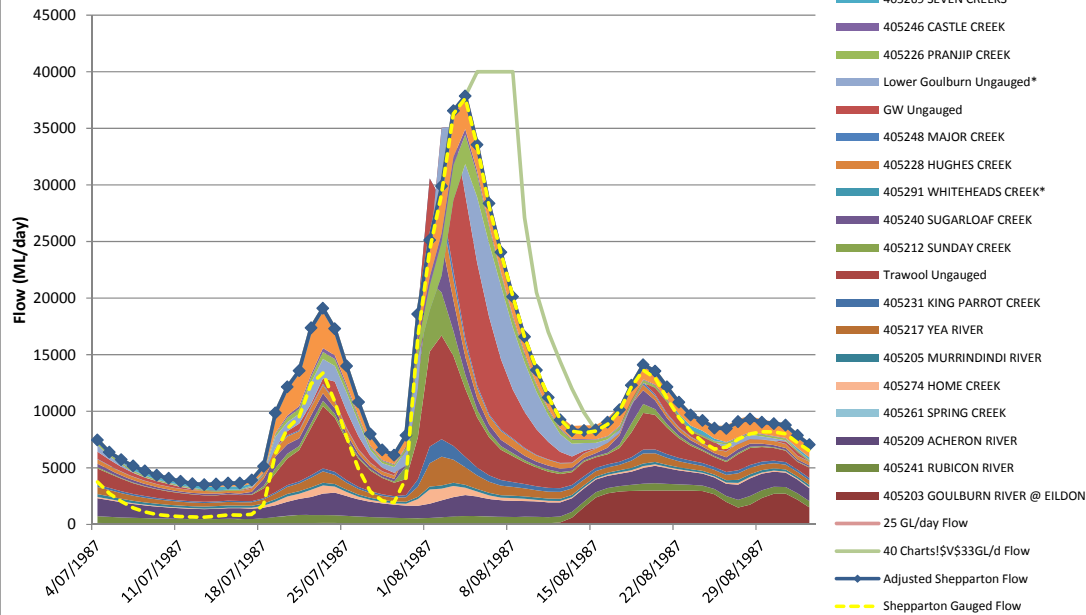
Event 74 - Peak Flow of 30623ML/day on 27/10/1986



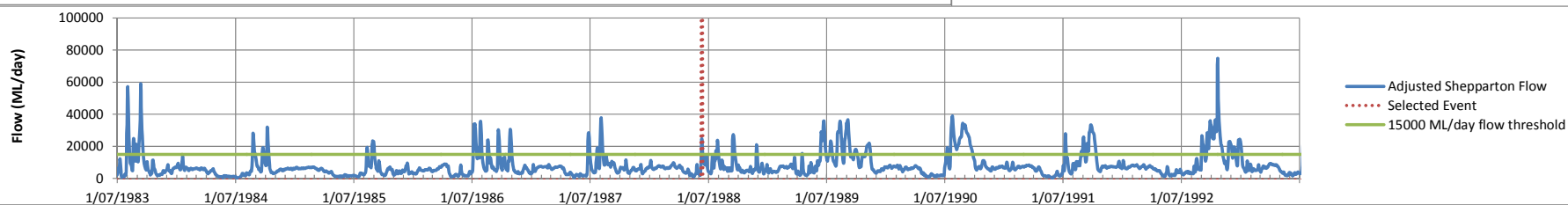
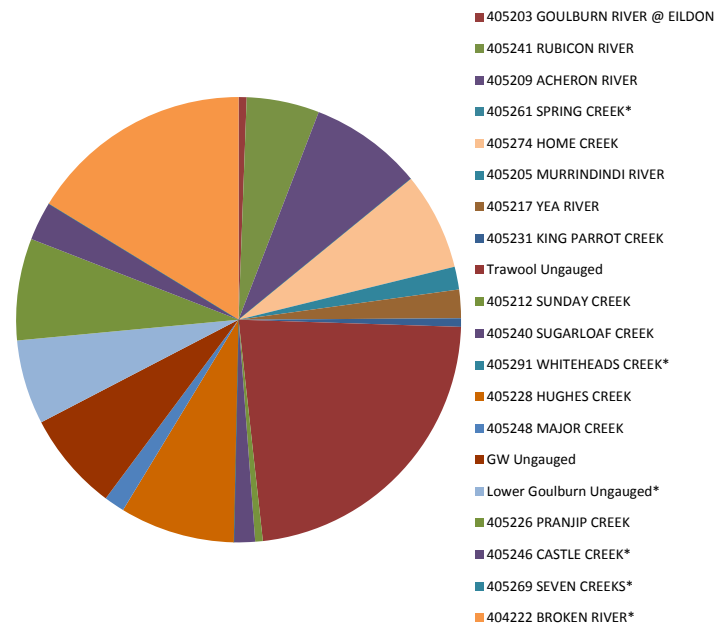
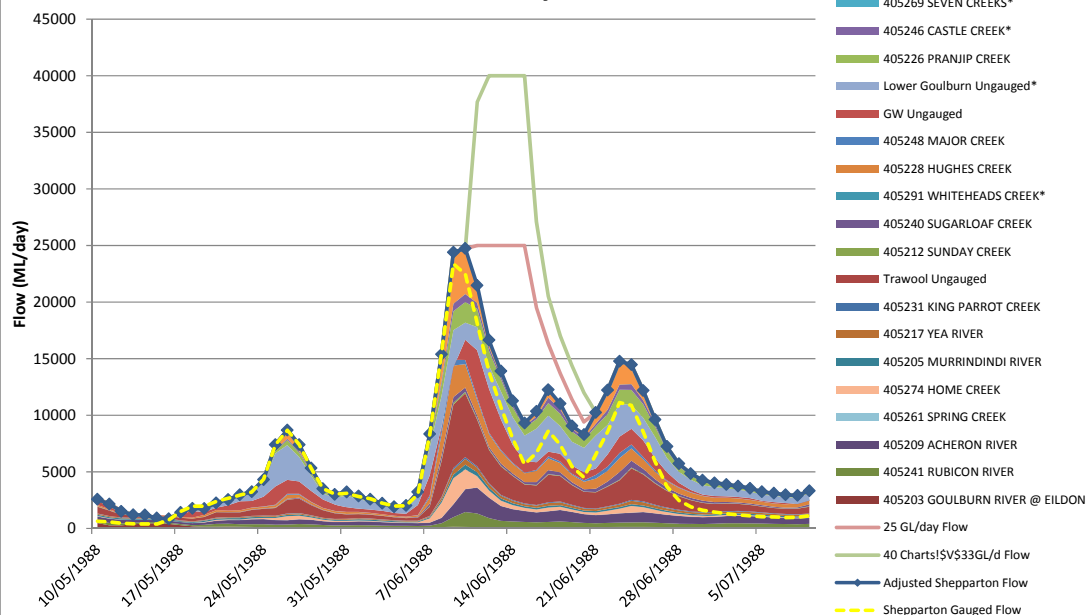




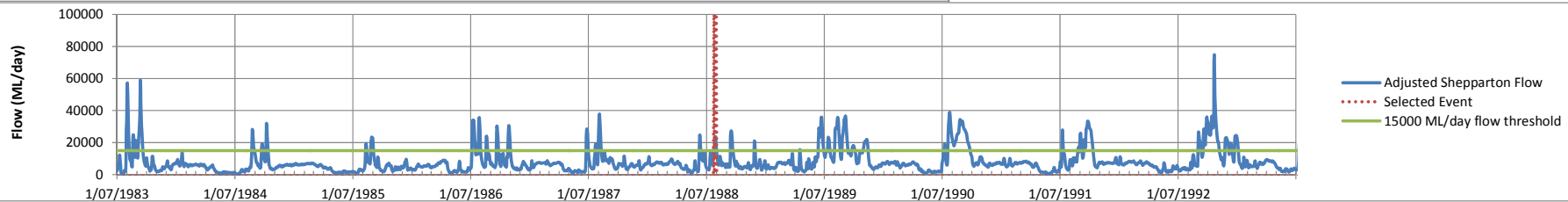
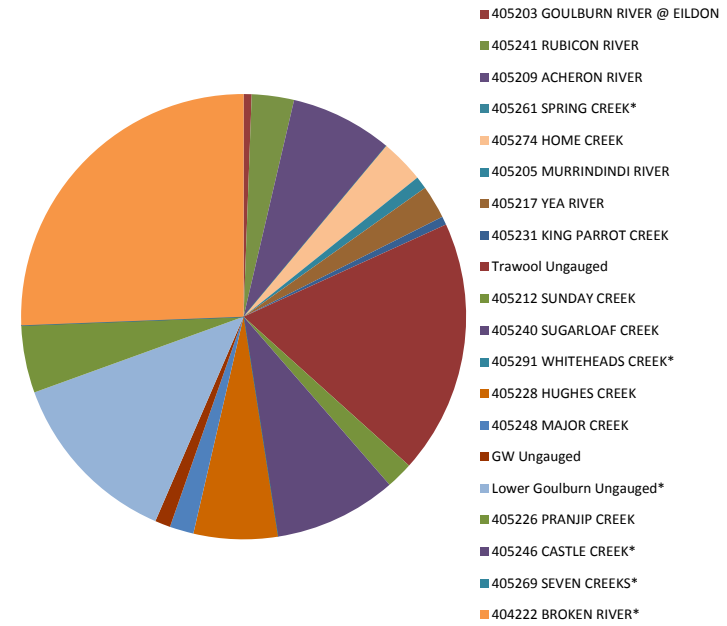
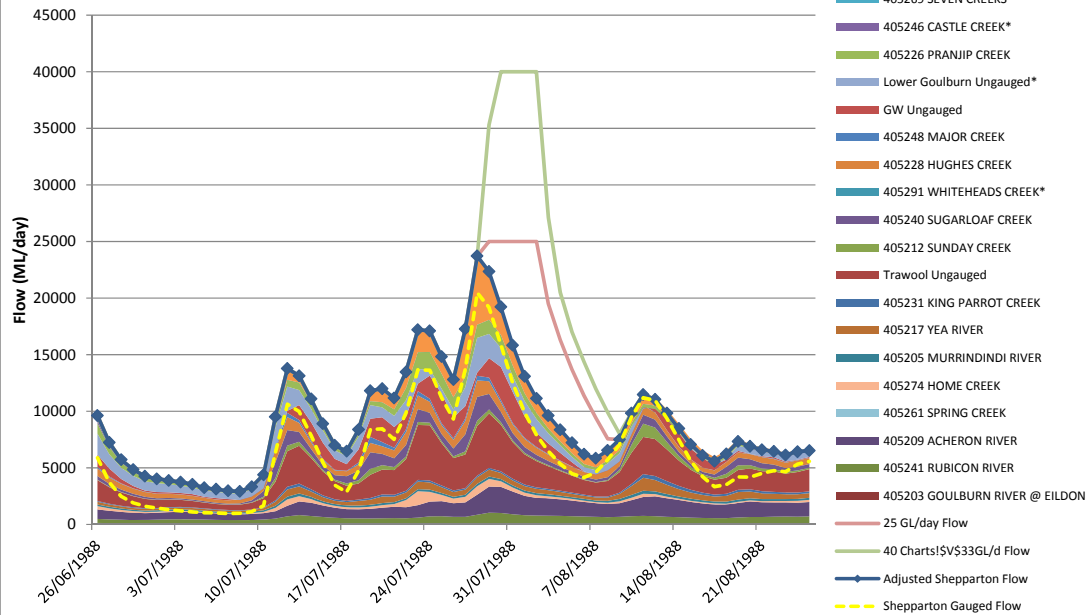
Event 77 - Peak Flow of 37843ML/day on 04/08/1987



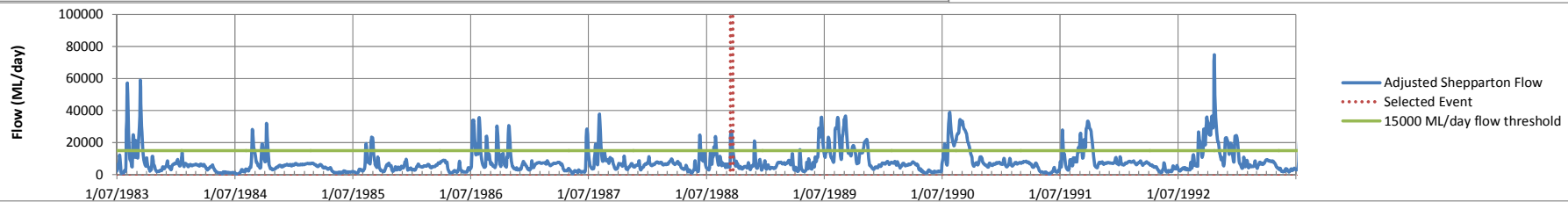
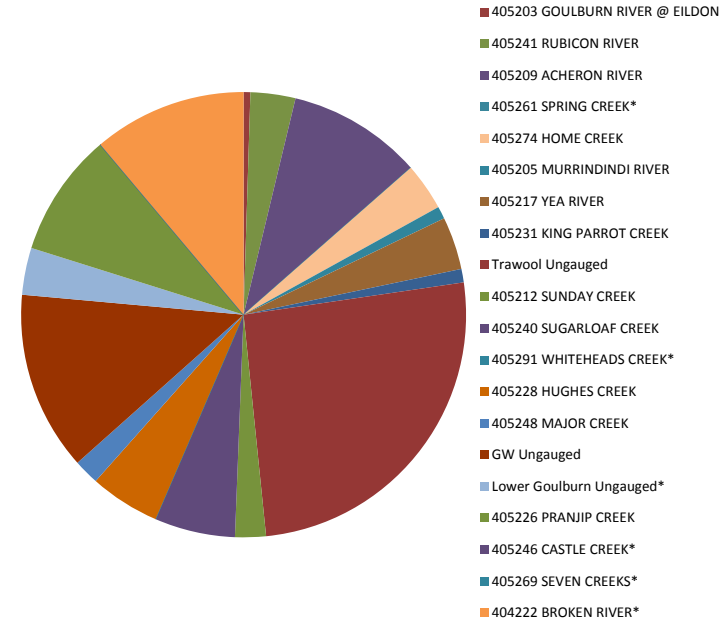
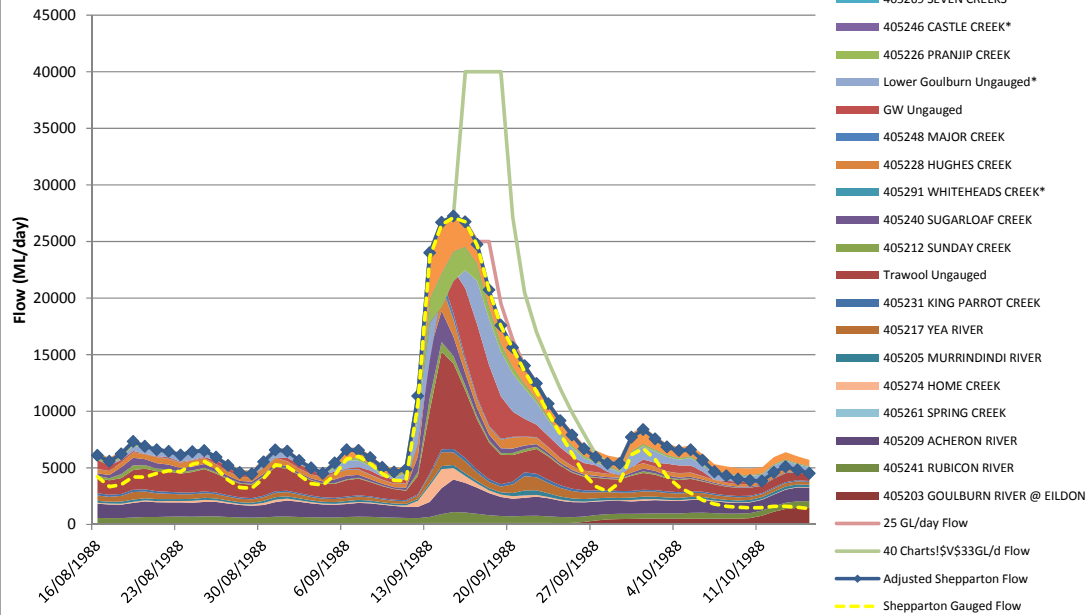
Event 78 - Peak Flow of 24737ML/day on 10/06/1988



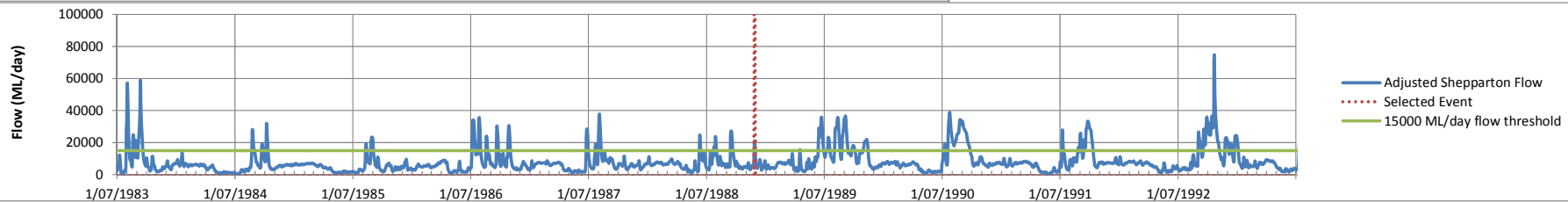
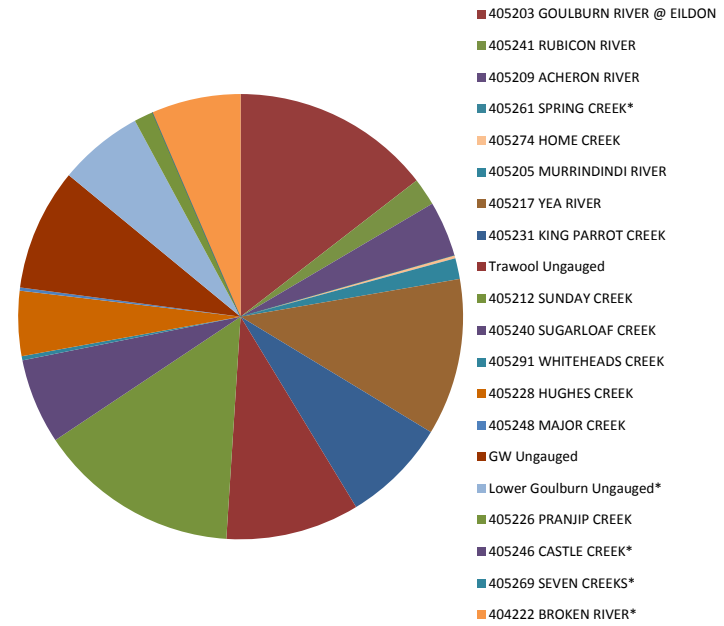
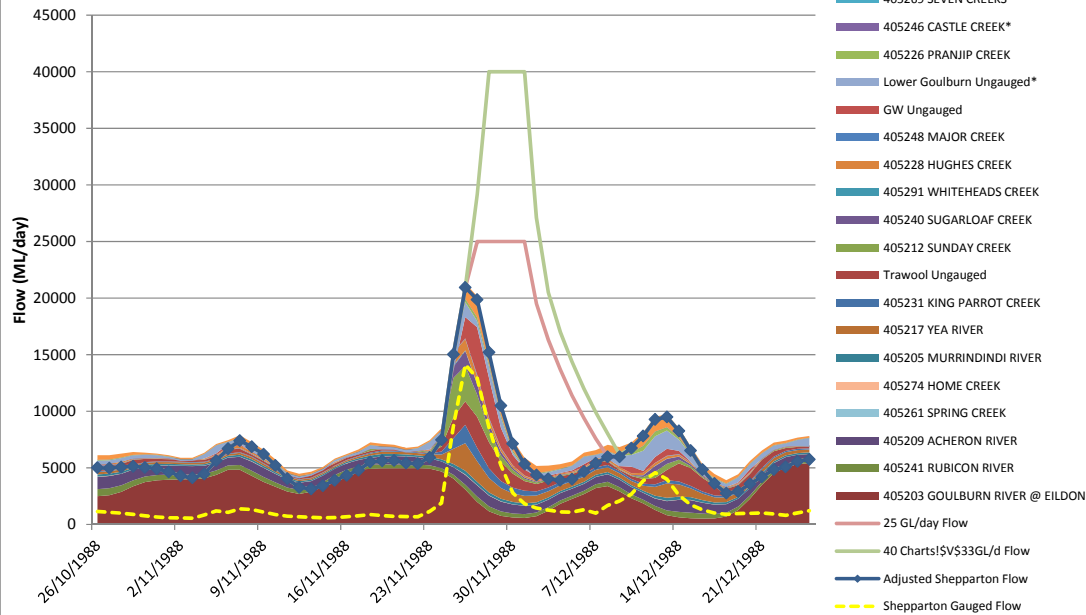
Event 79 - Peak Flow of 23722ML/day on 28/07/1988



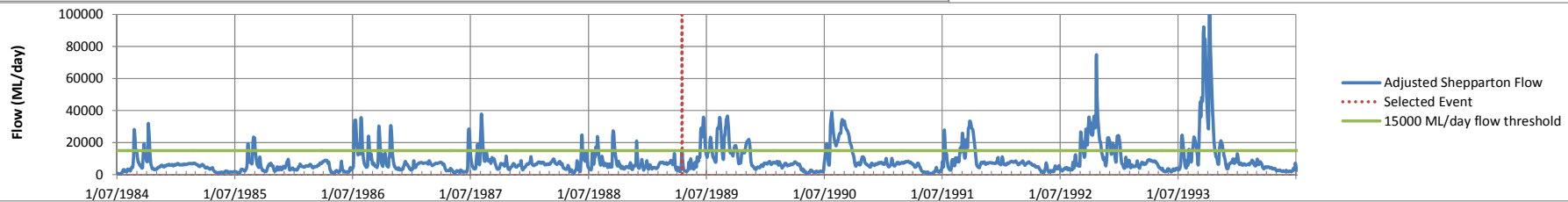
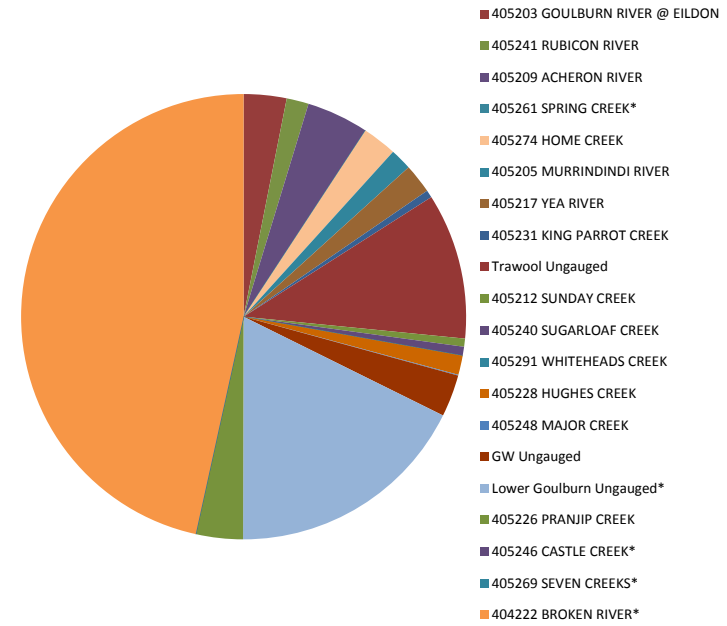
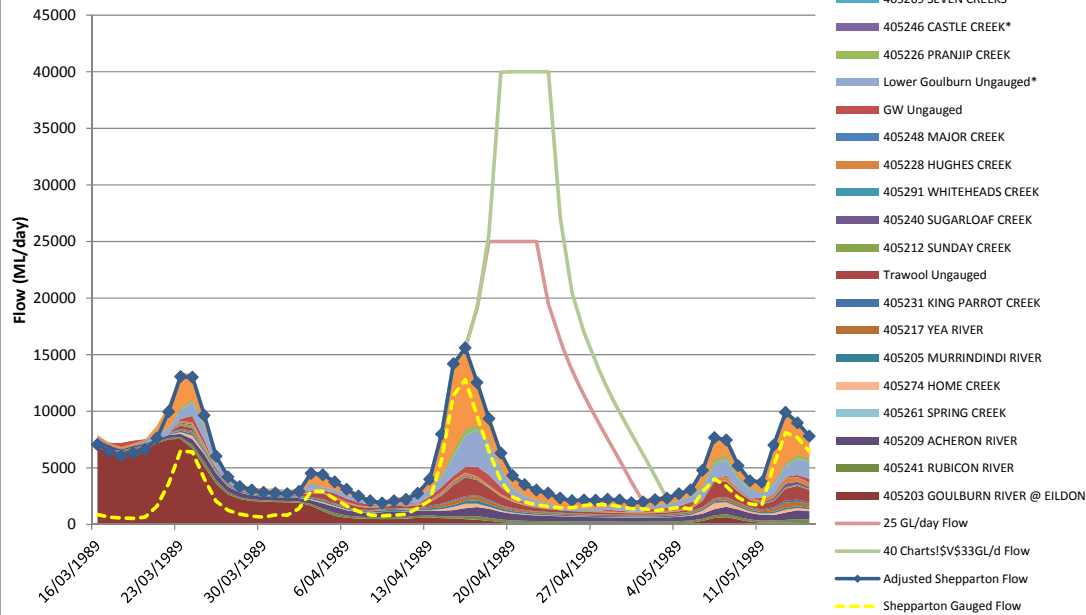
Event 80 - Peak Flow of 27242ML/day on 15/09/1988



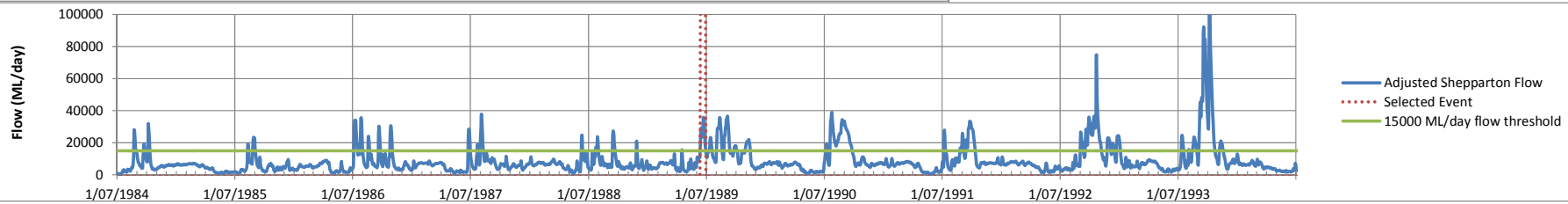
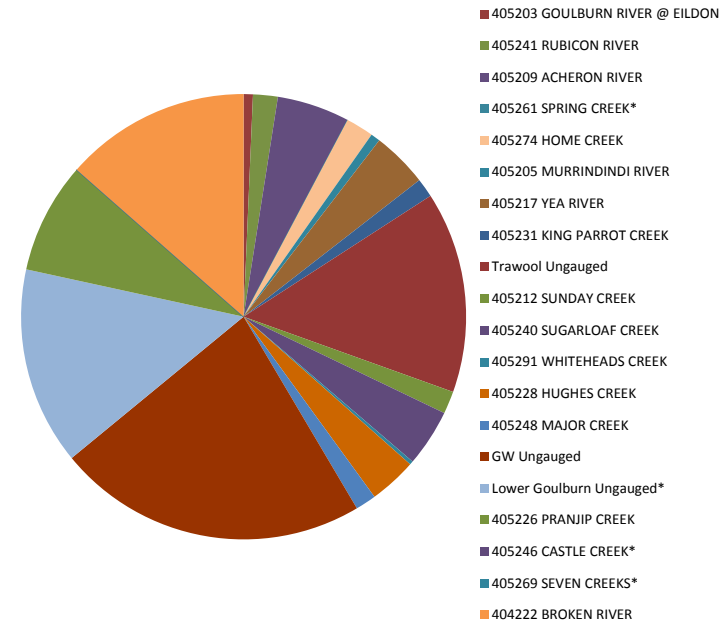
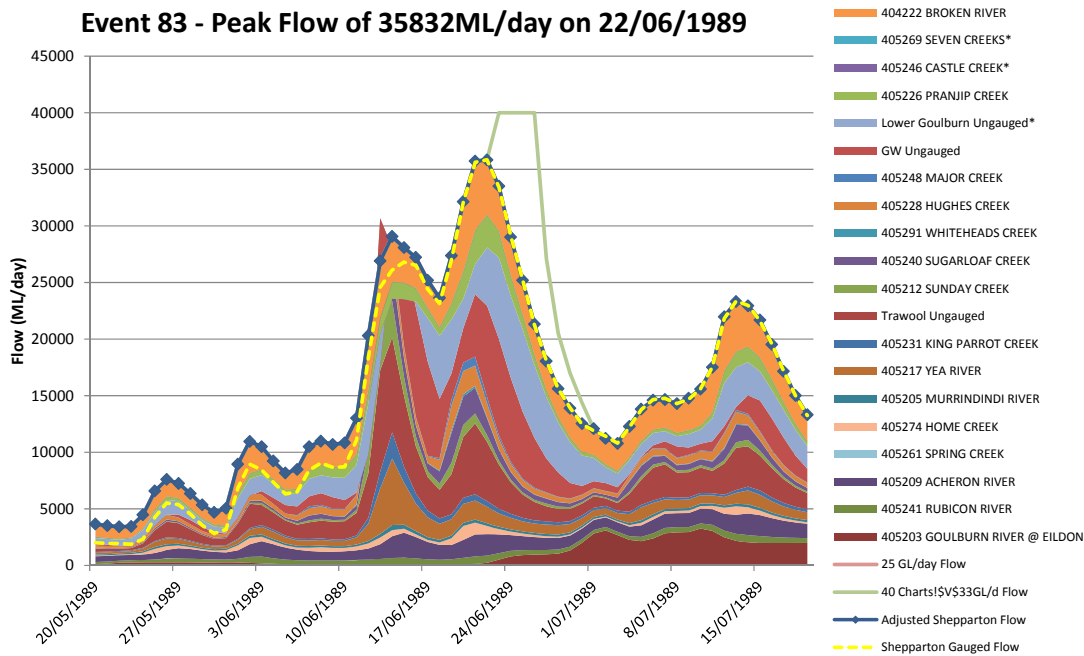
Event 81 - Peak Flow of 20938ML/day on 26/11/1988

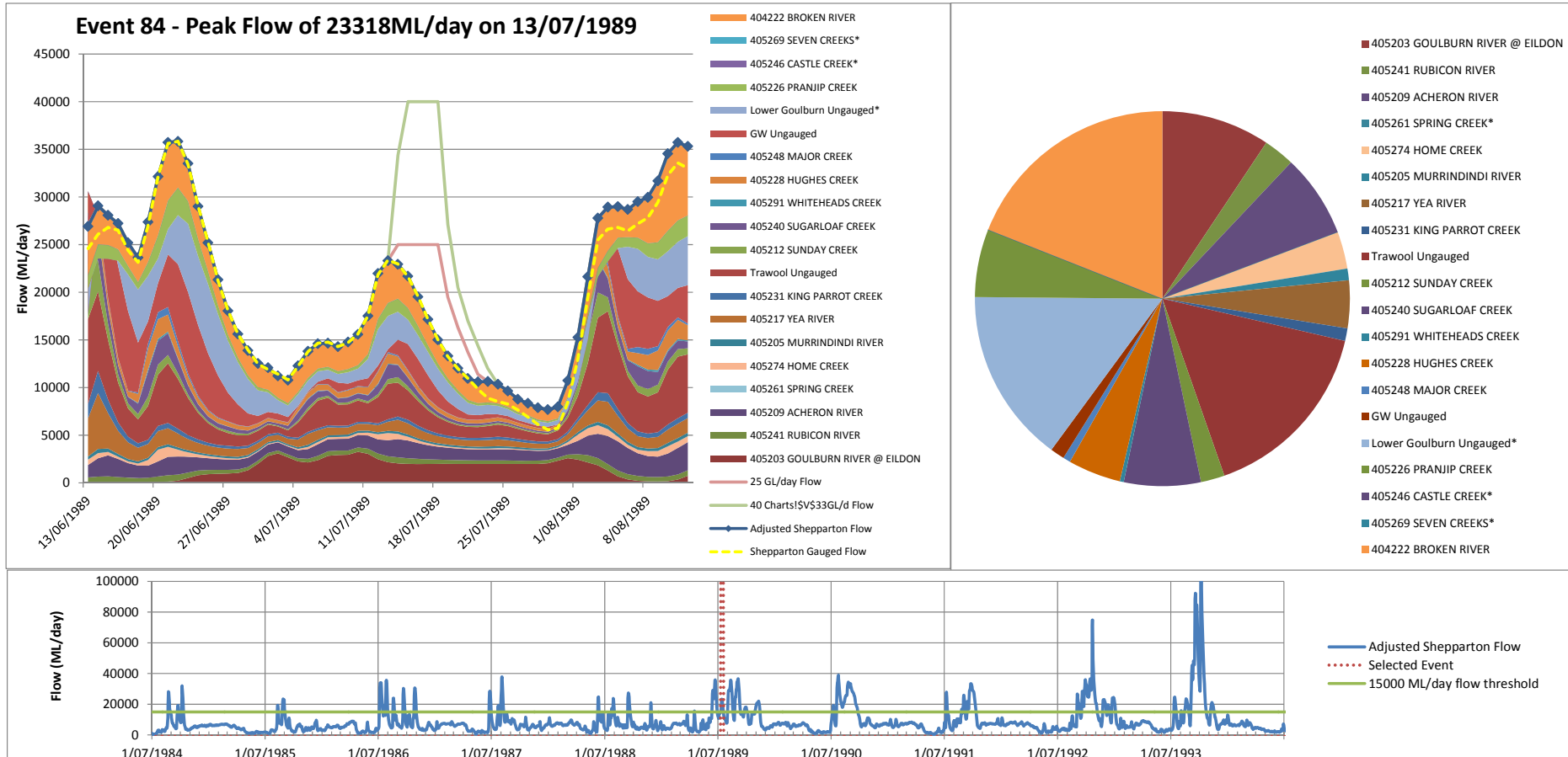


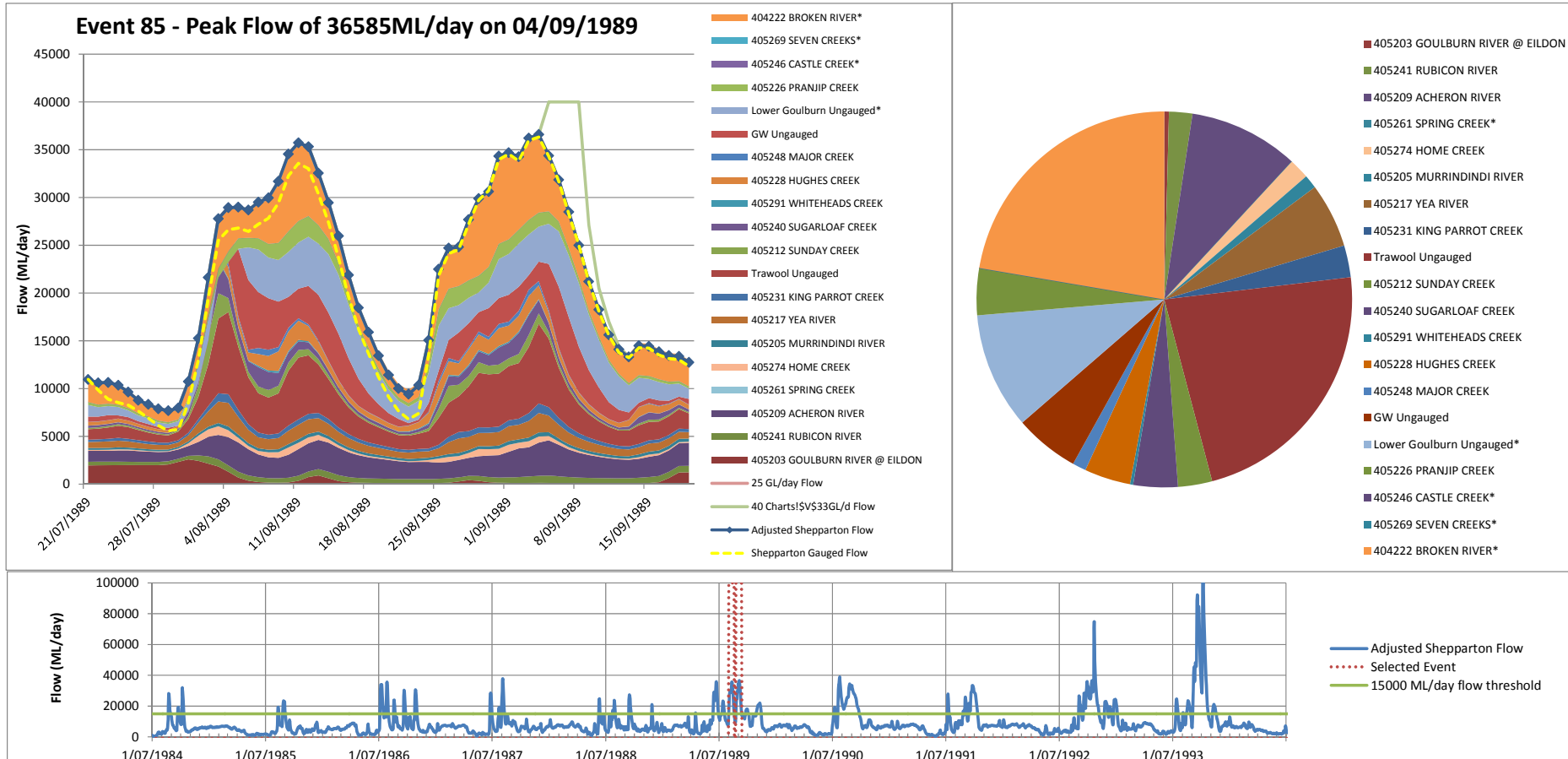
Event 82 - Peak Flow of 15595ML/day on 16/04/1989

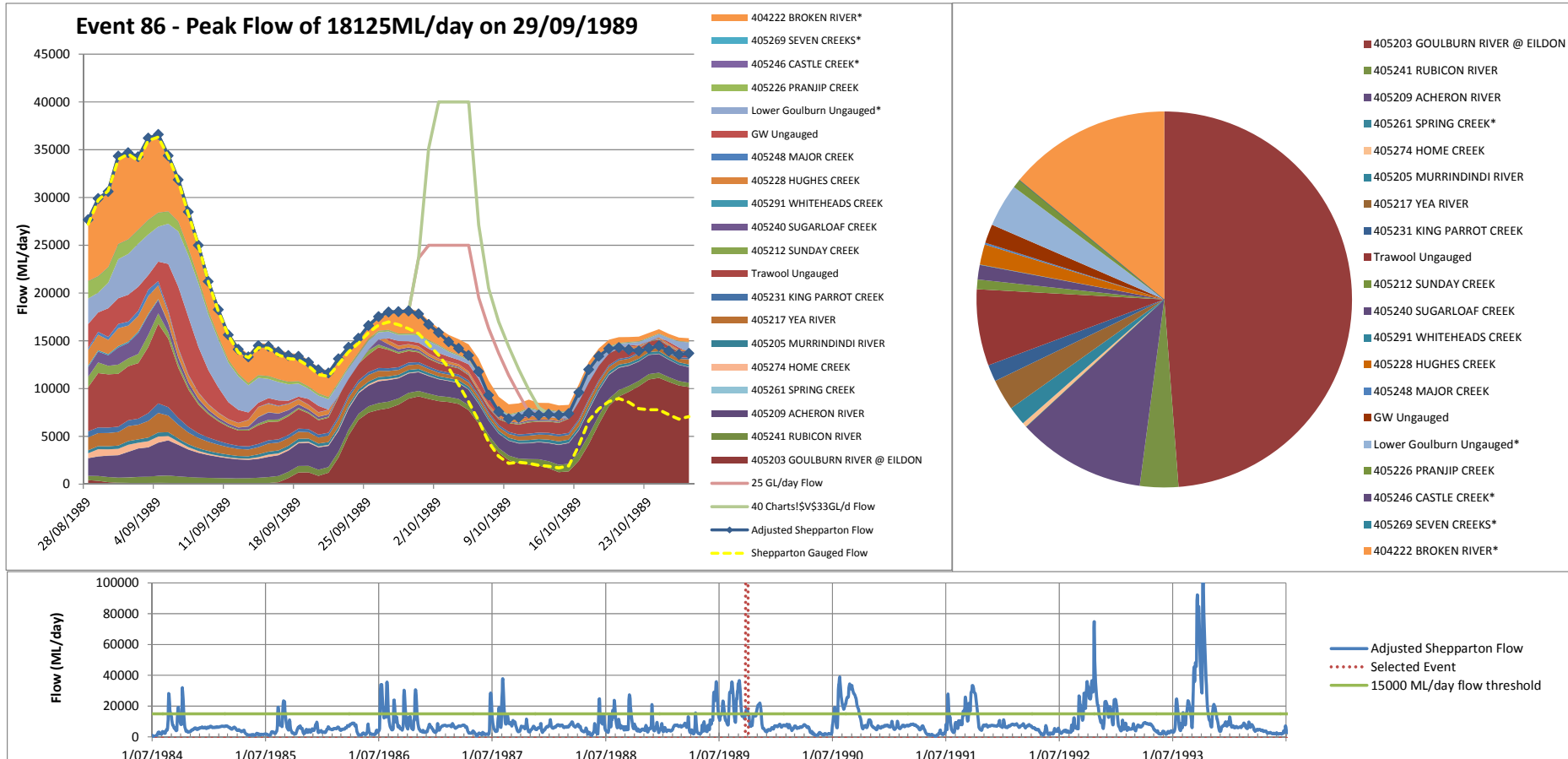


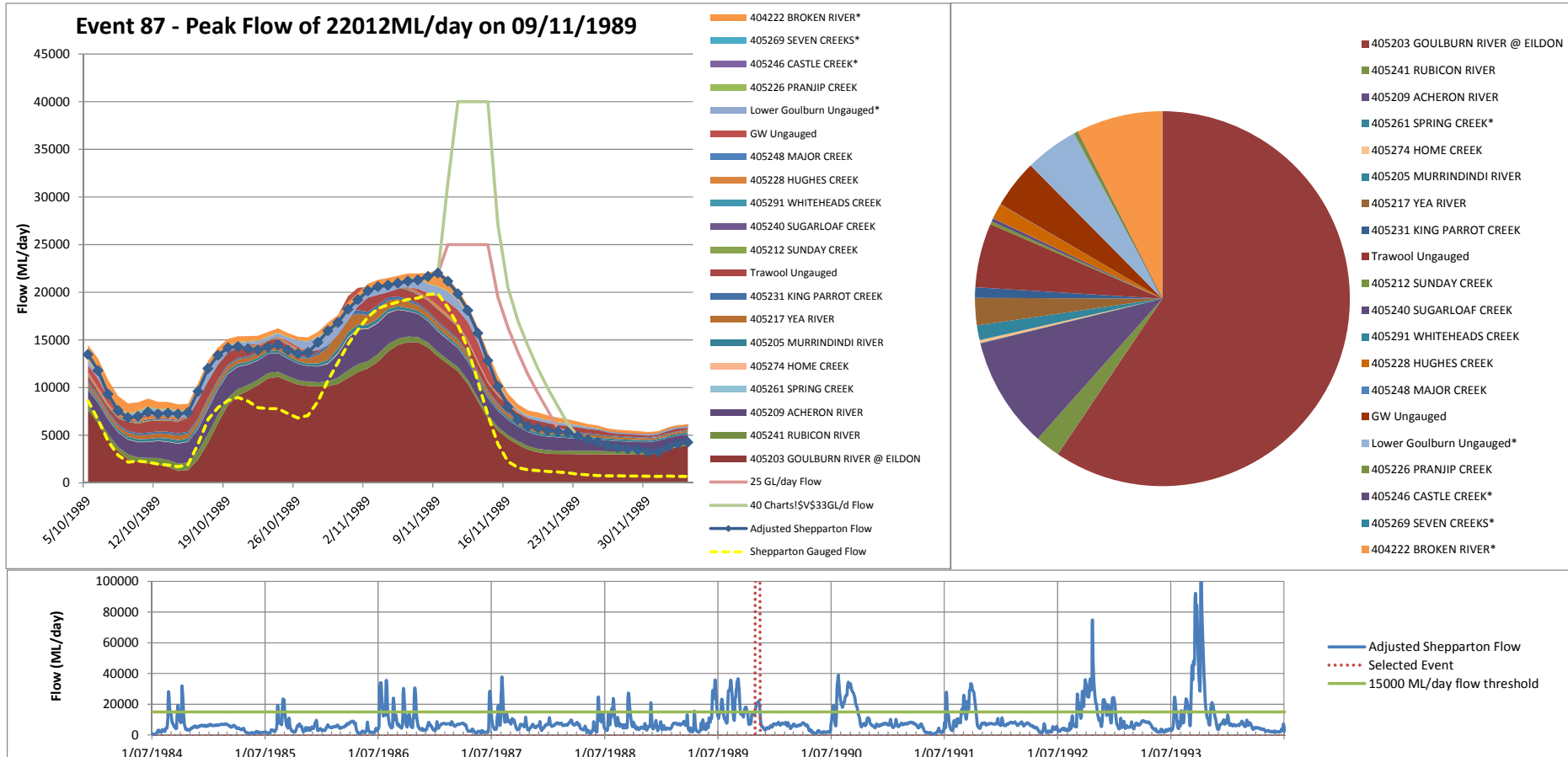
Event 83 - Peak Flow of 35832ML/day on 22/06/1989

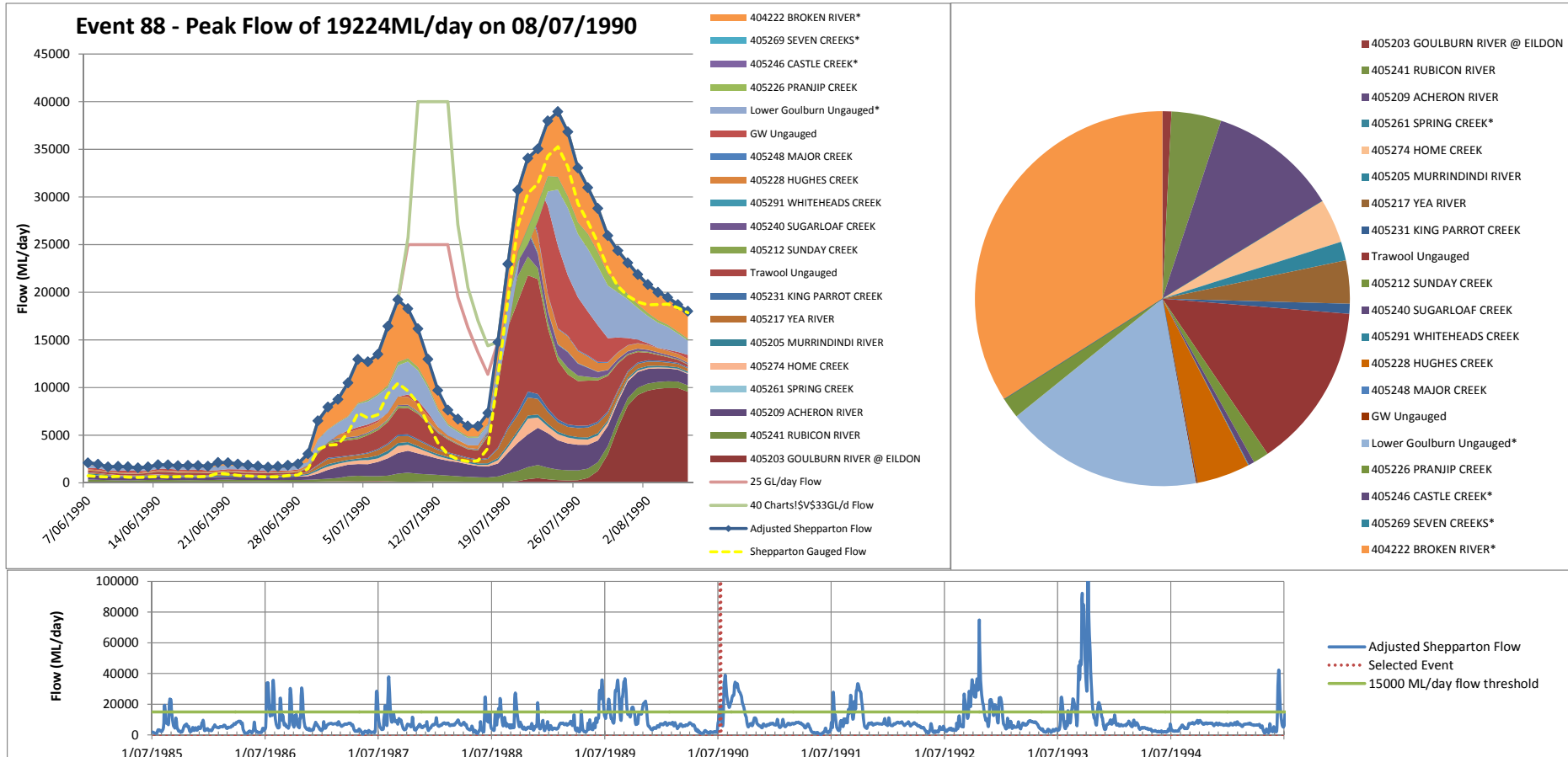


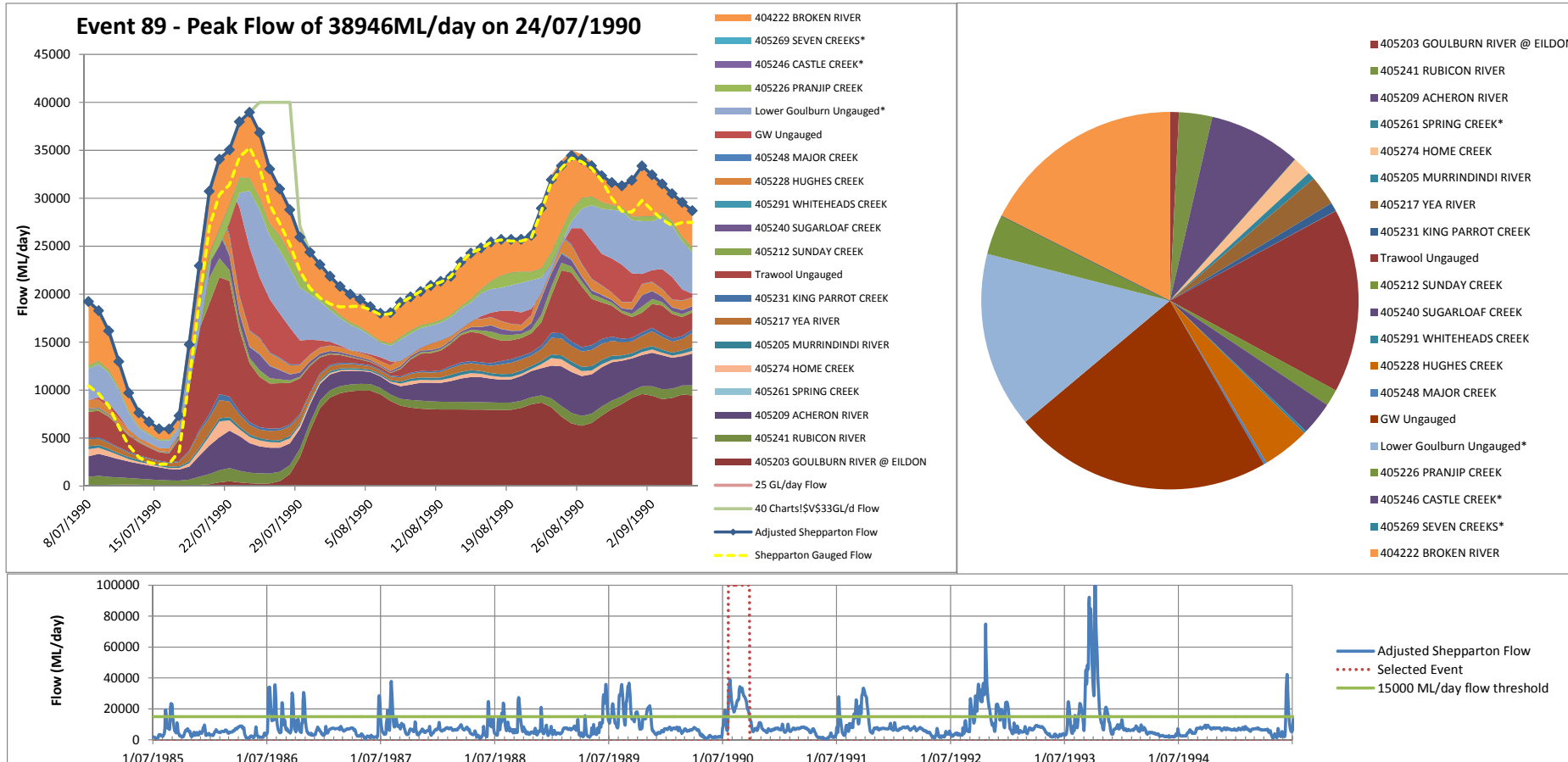




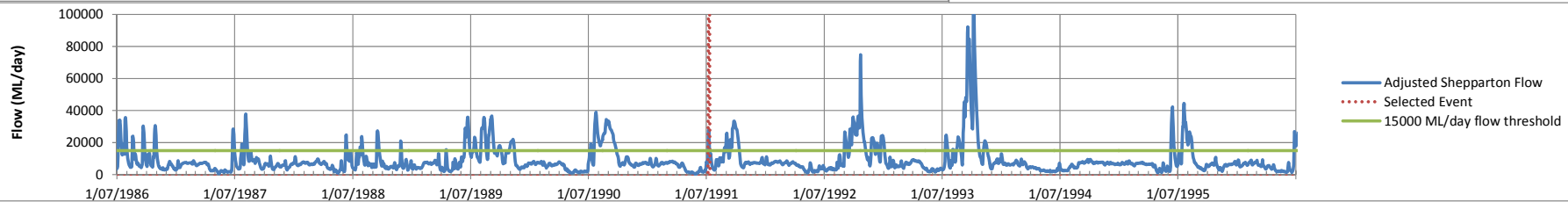
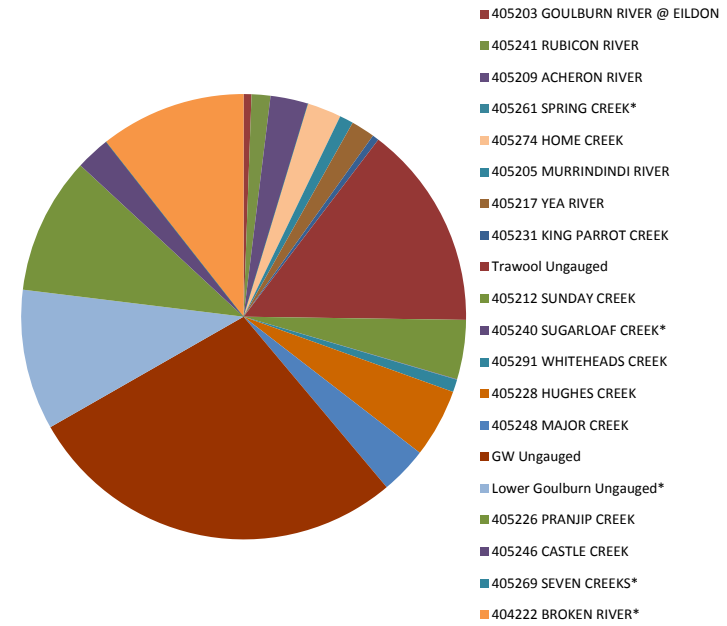
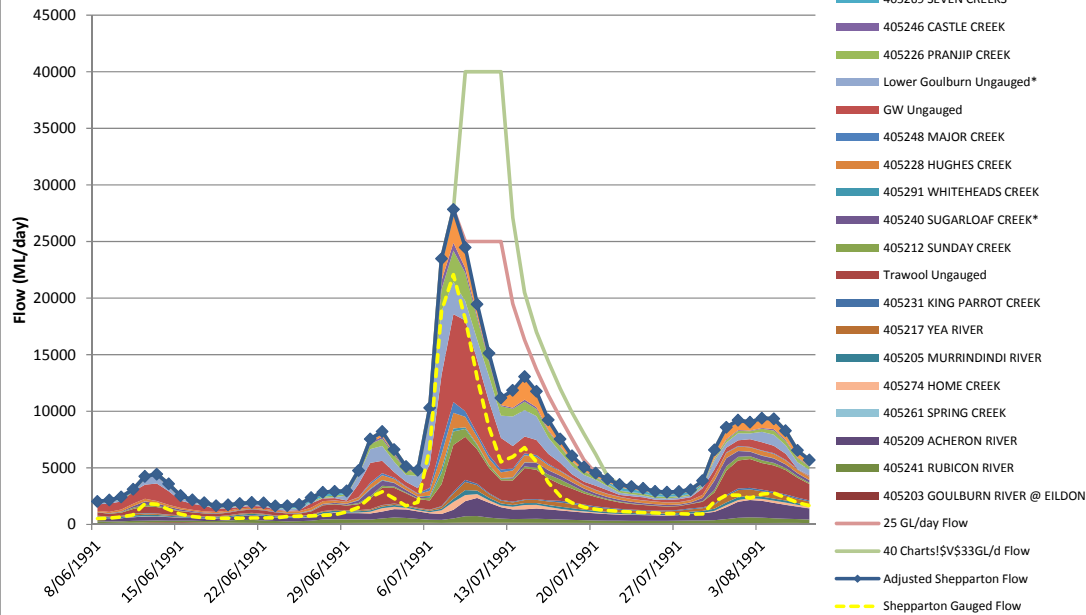


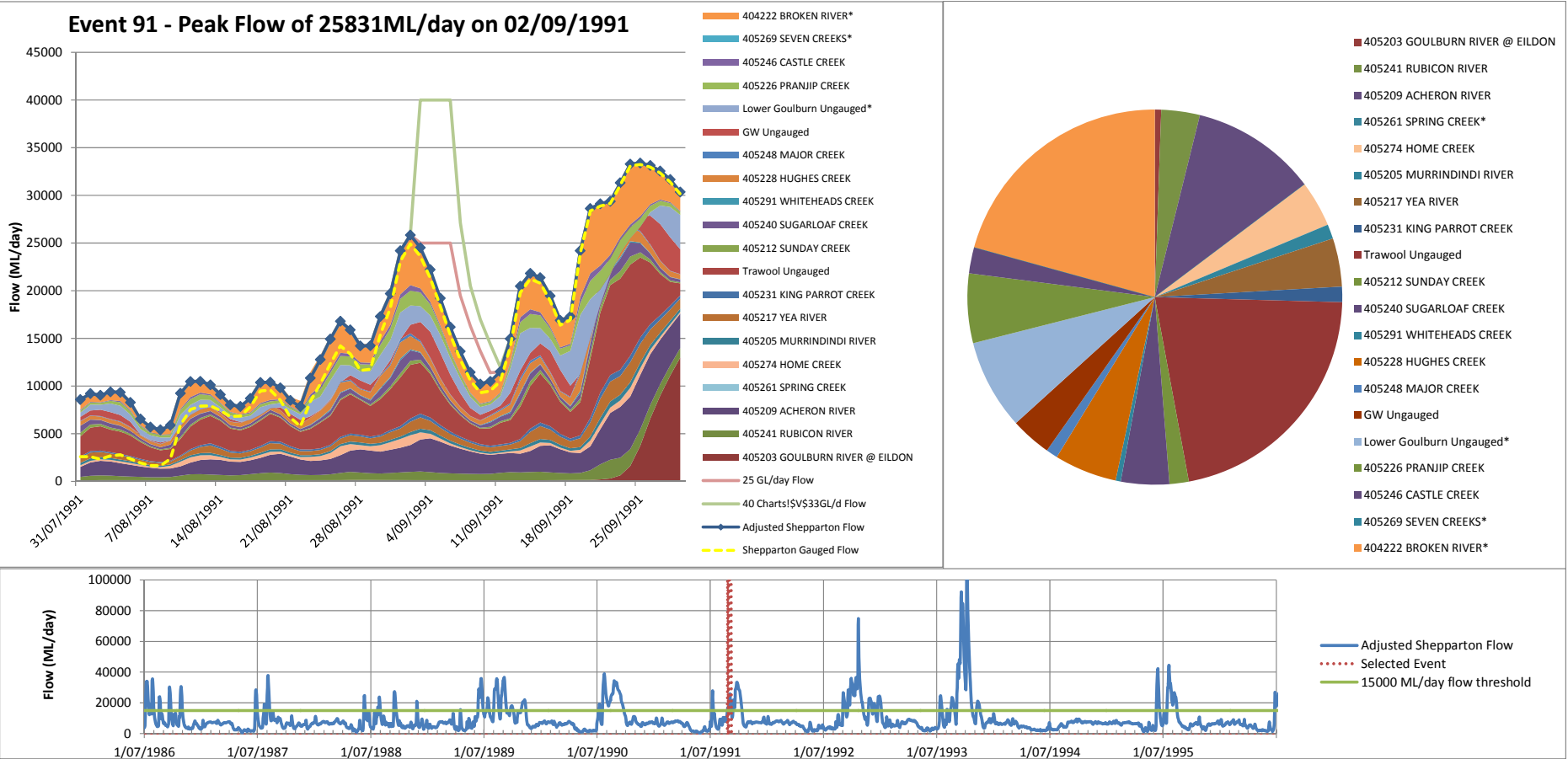




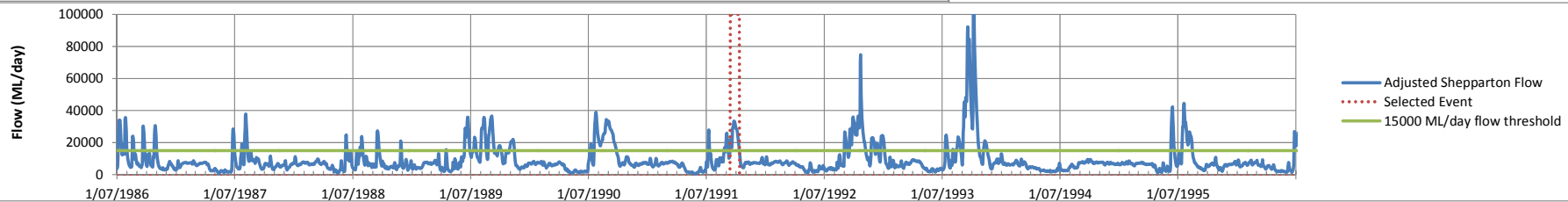
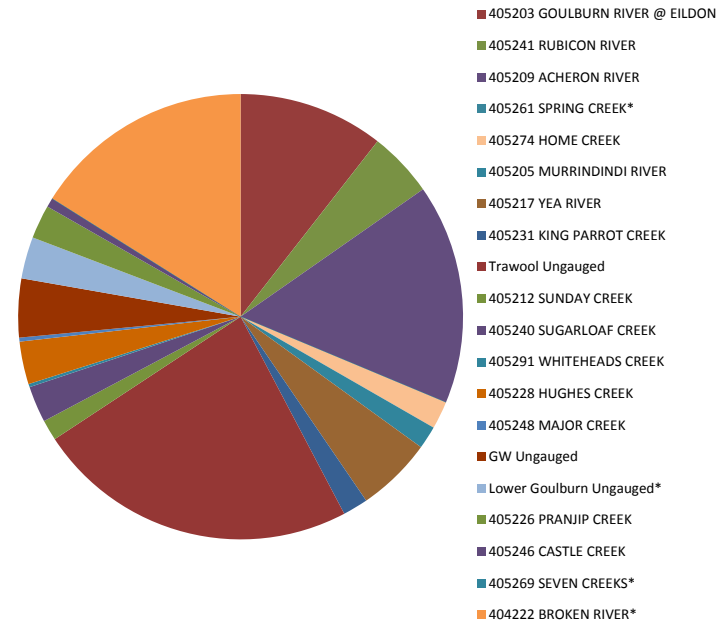
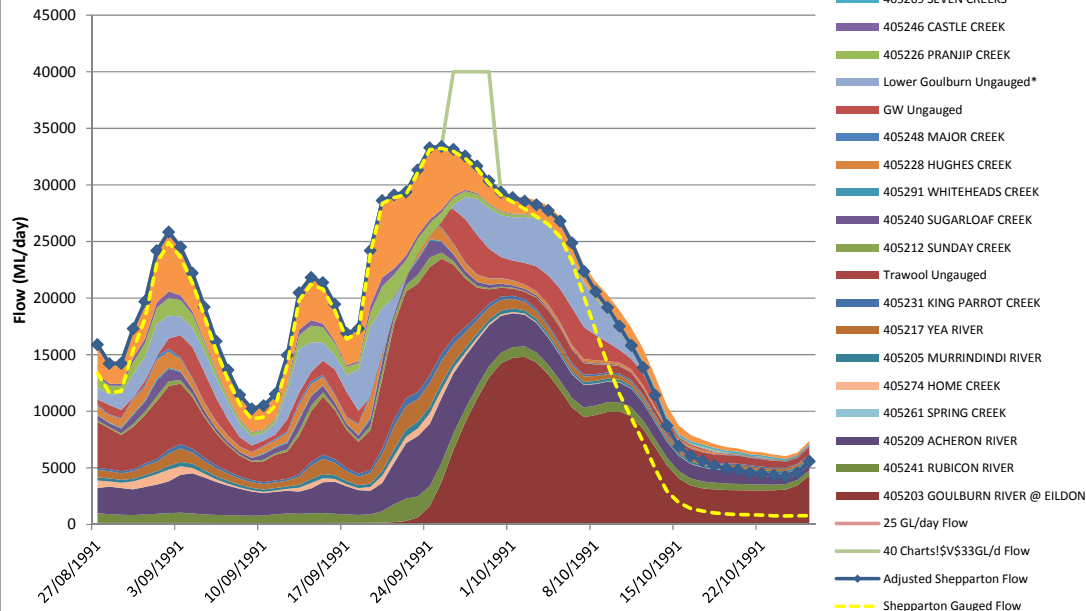


Event 90 - Peak Flow of 27836ML/day on 08/07/1991

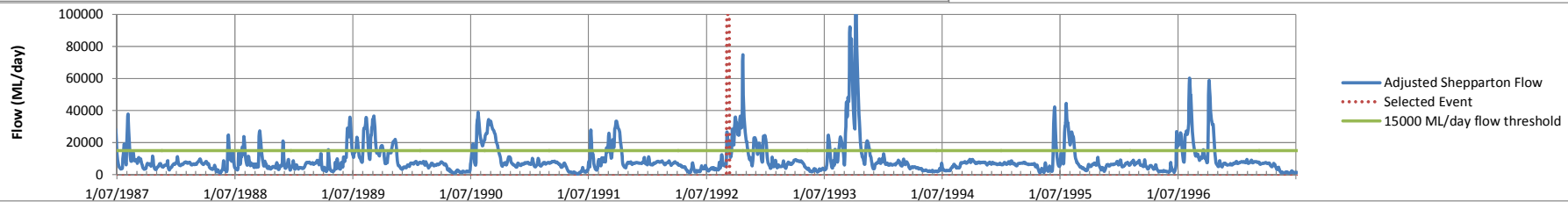
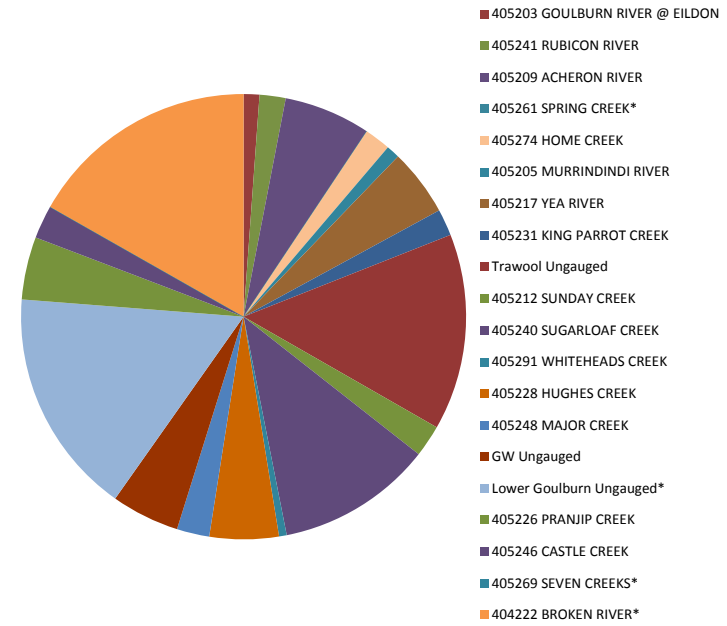
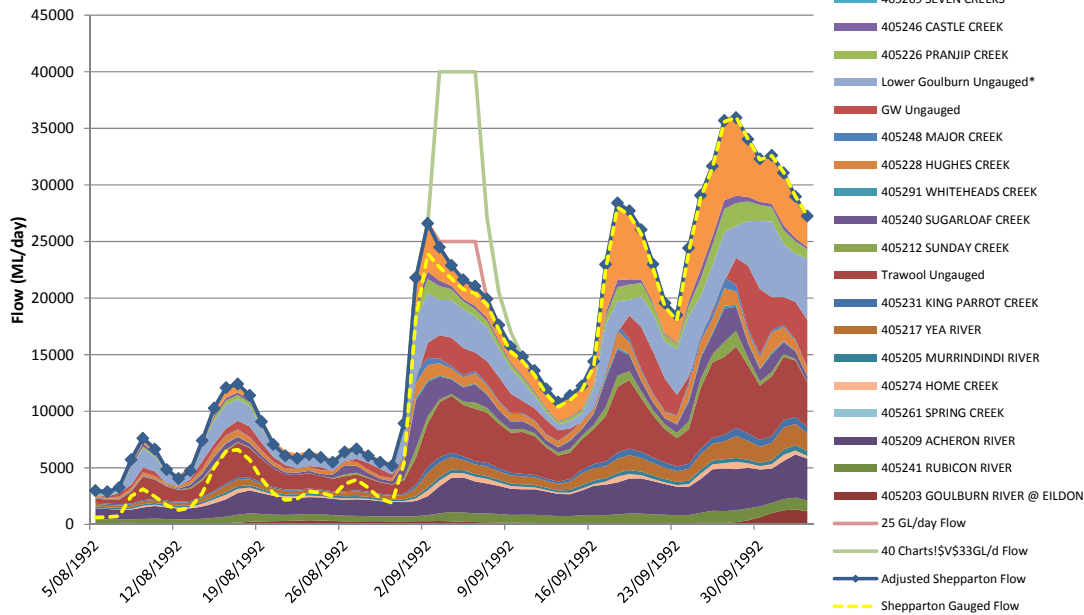


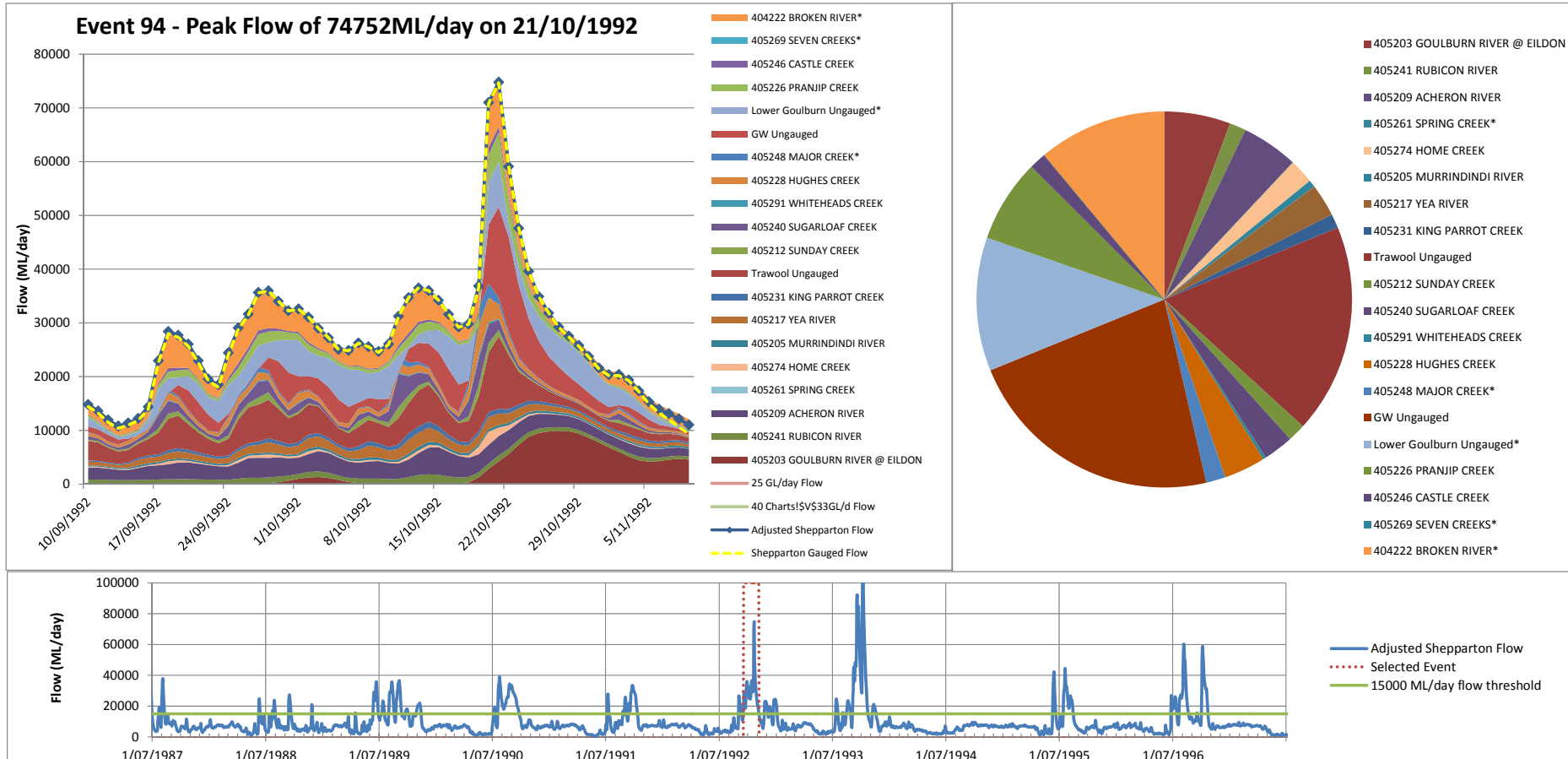


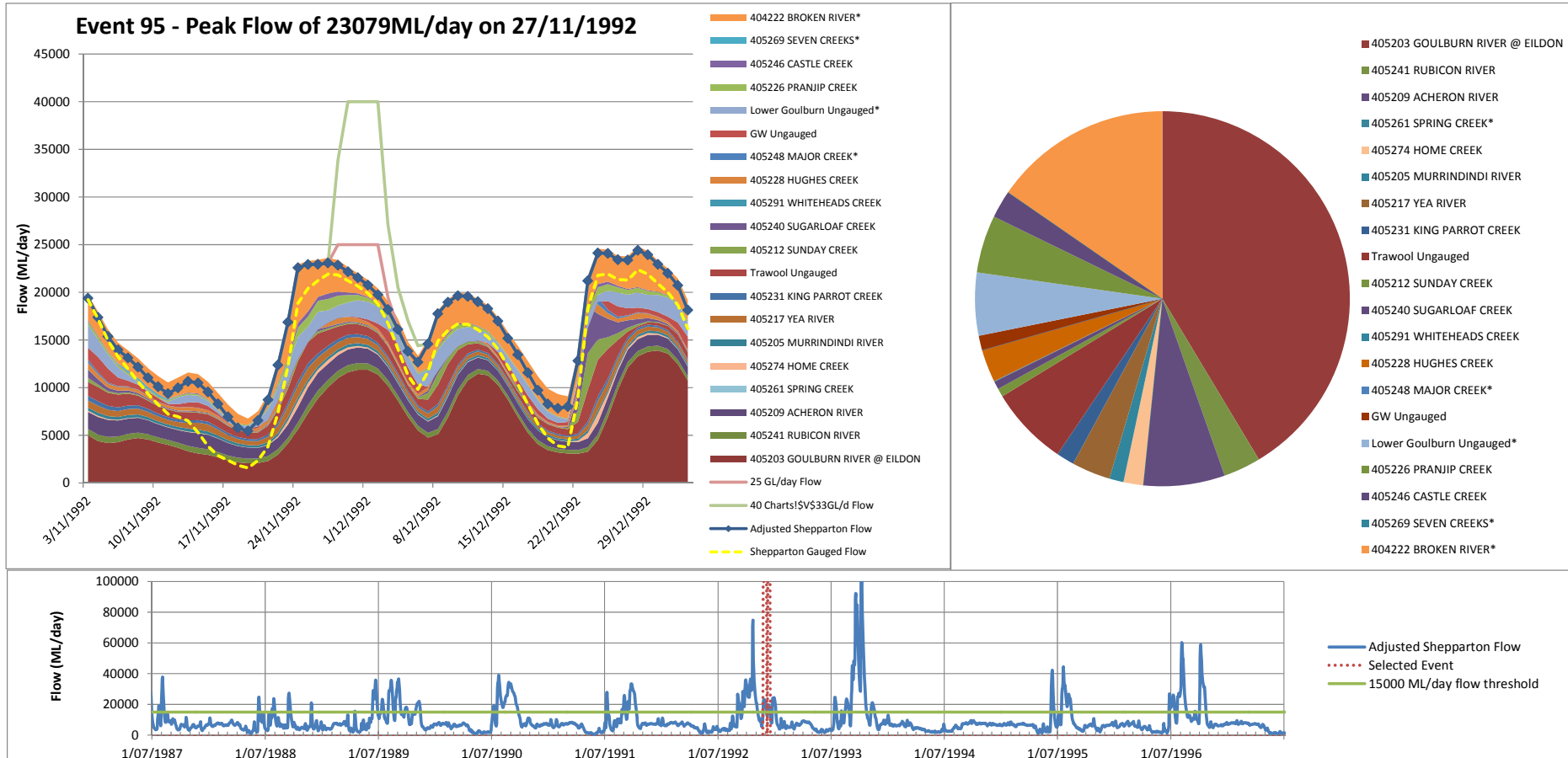
Event 92 - Peak Flow of 33377ML/day on 25/09/1991

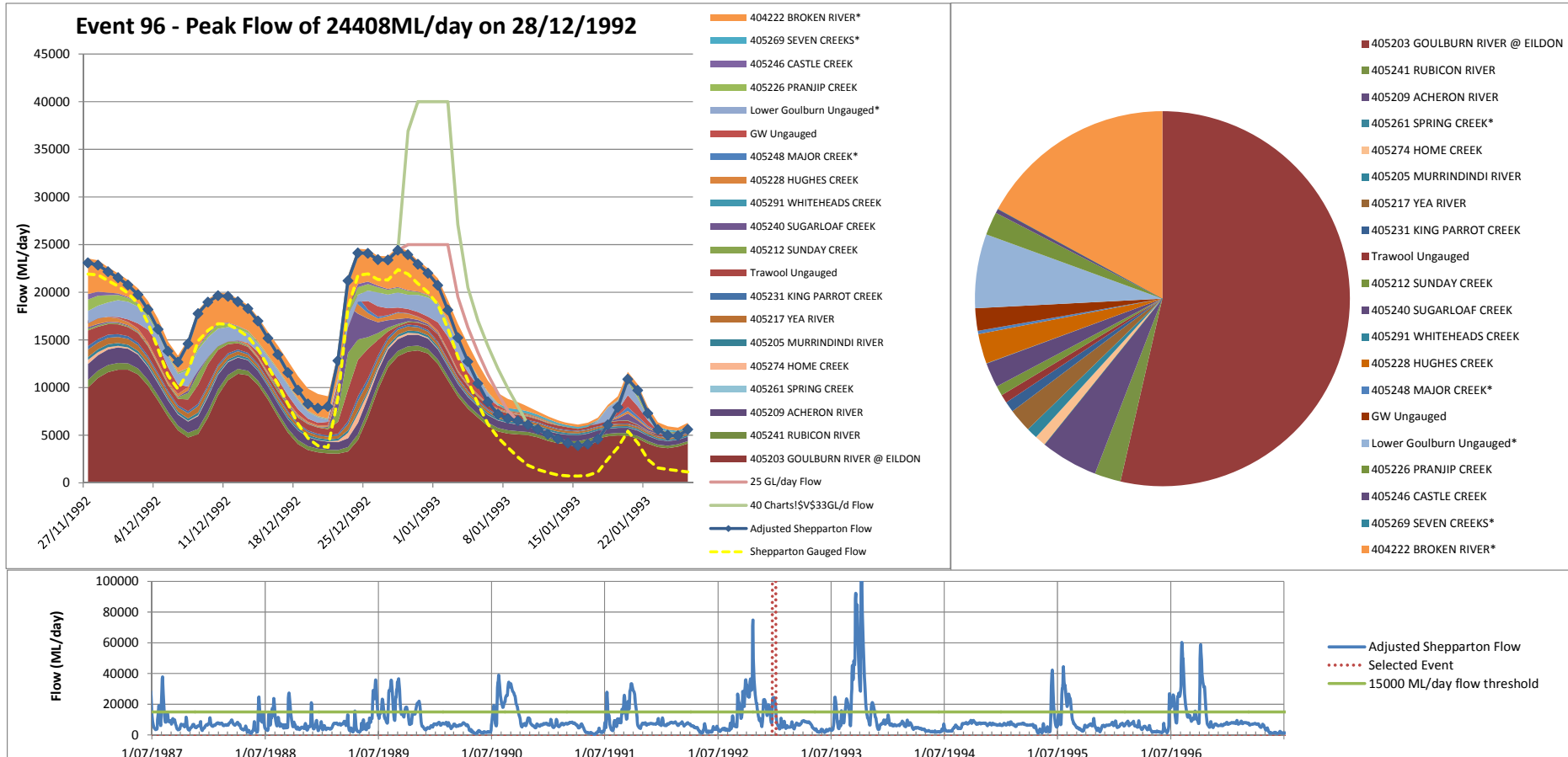


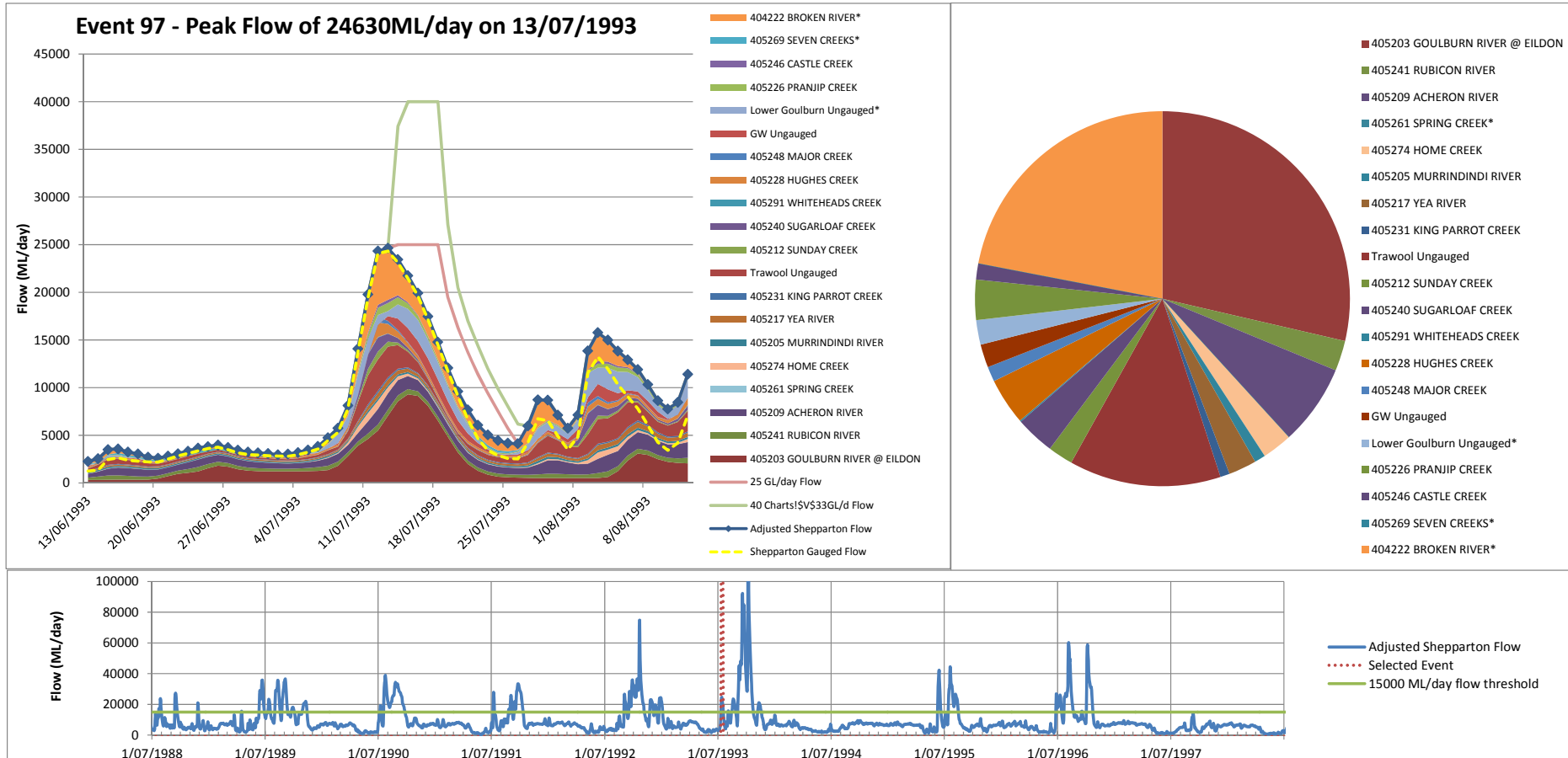
Event 93 - Peak Flow of 26596ML/day on 02/09/1992

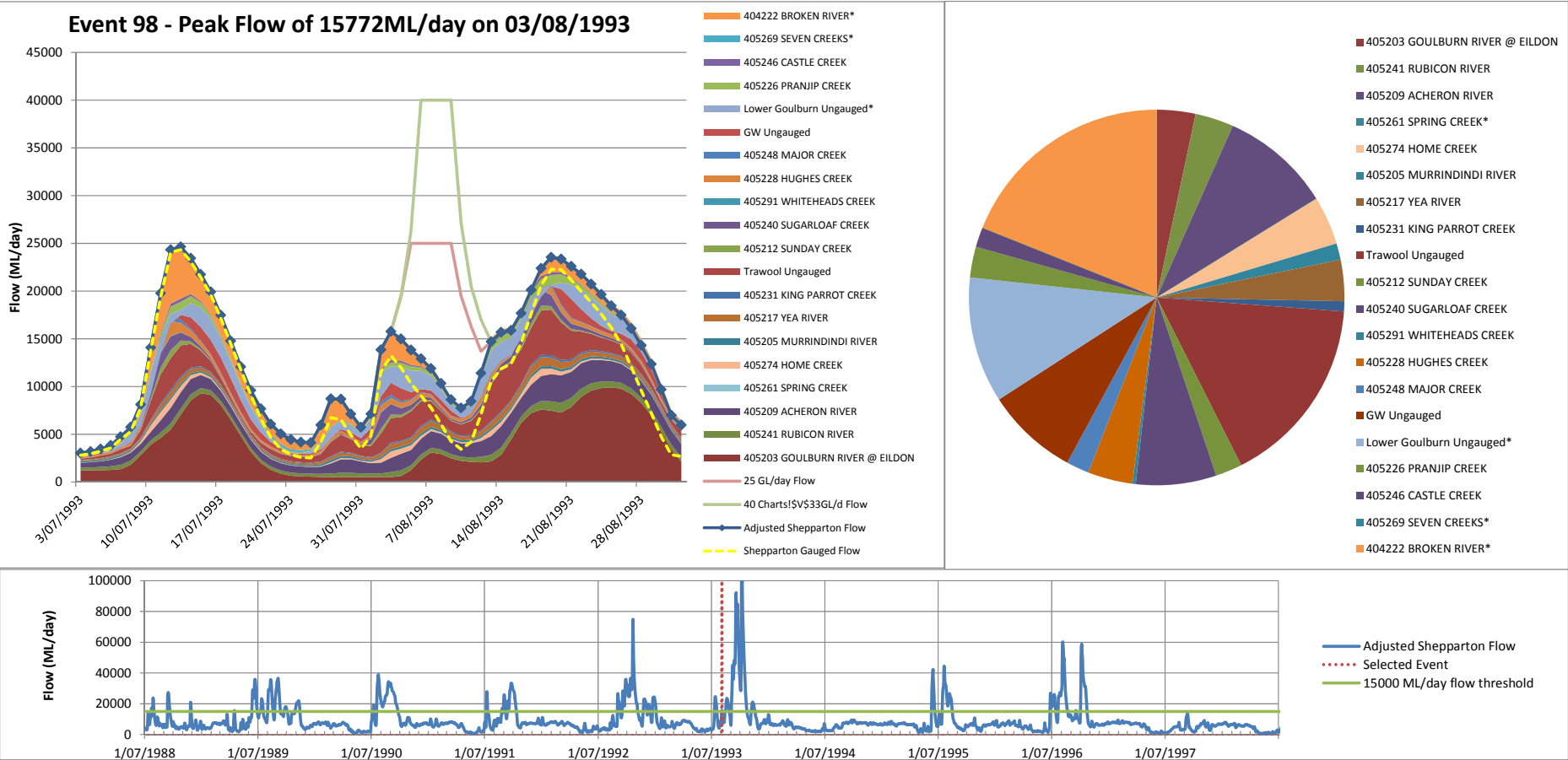


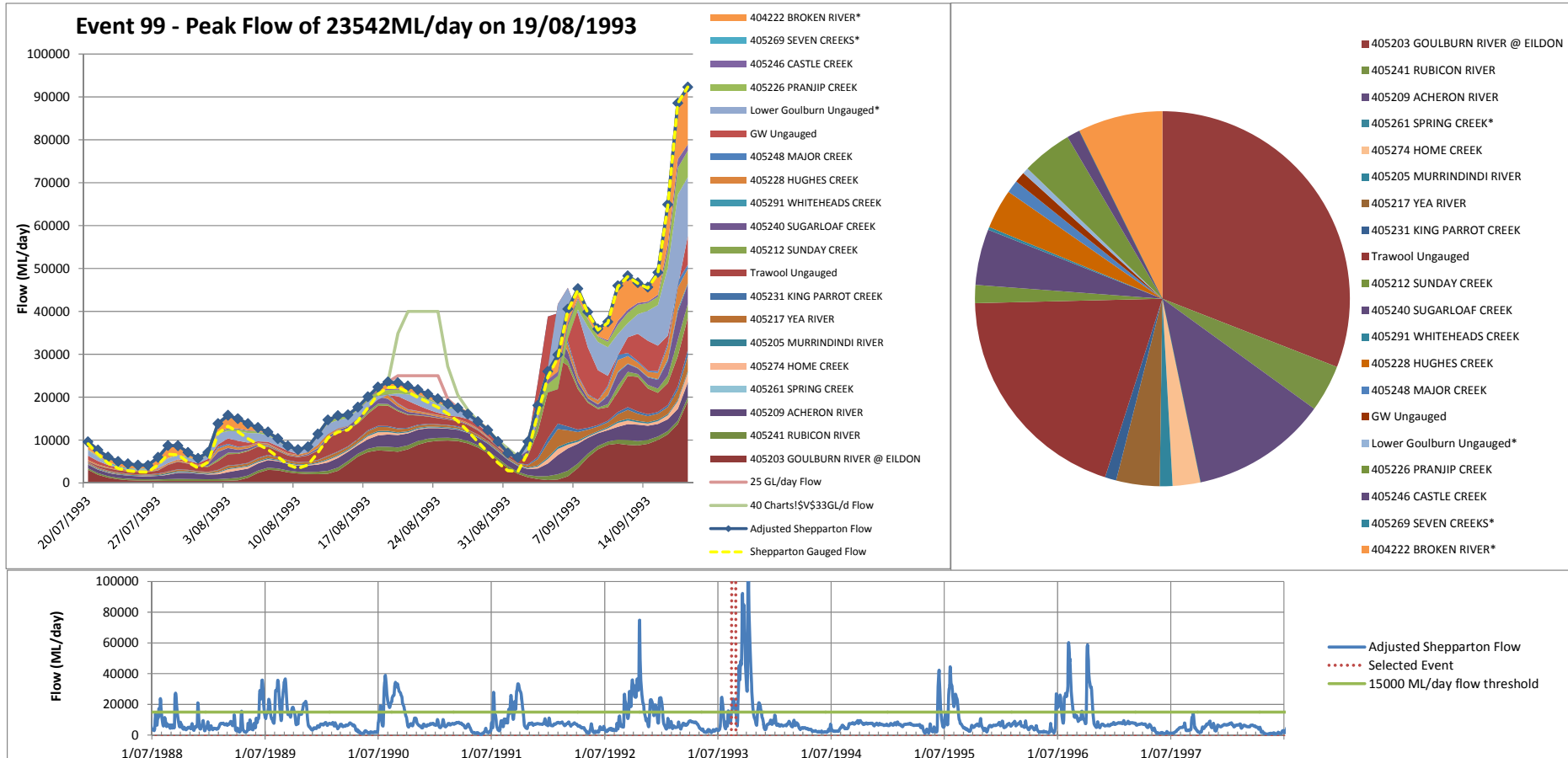


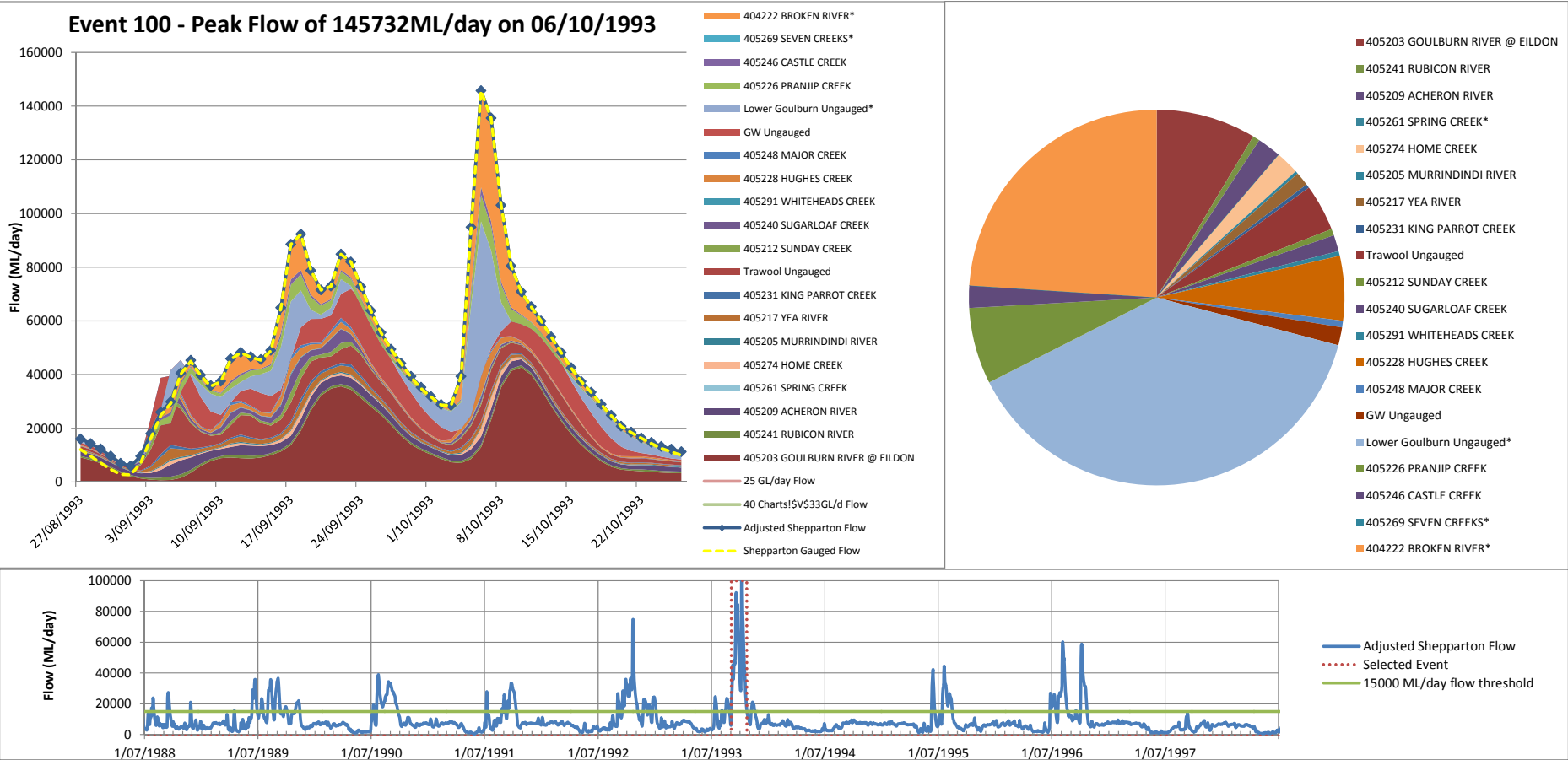


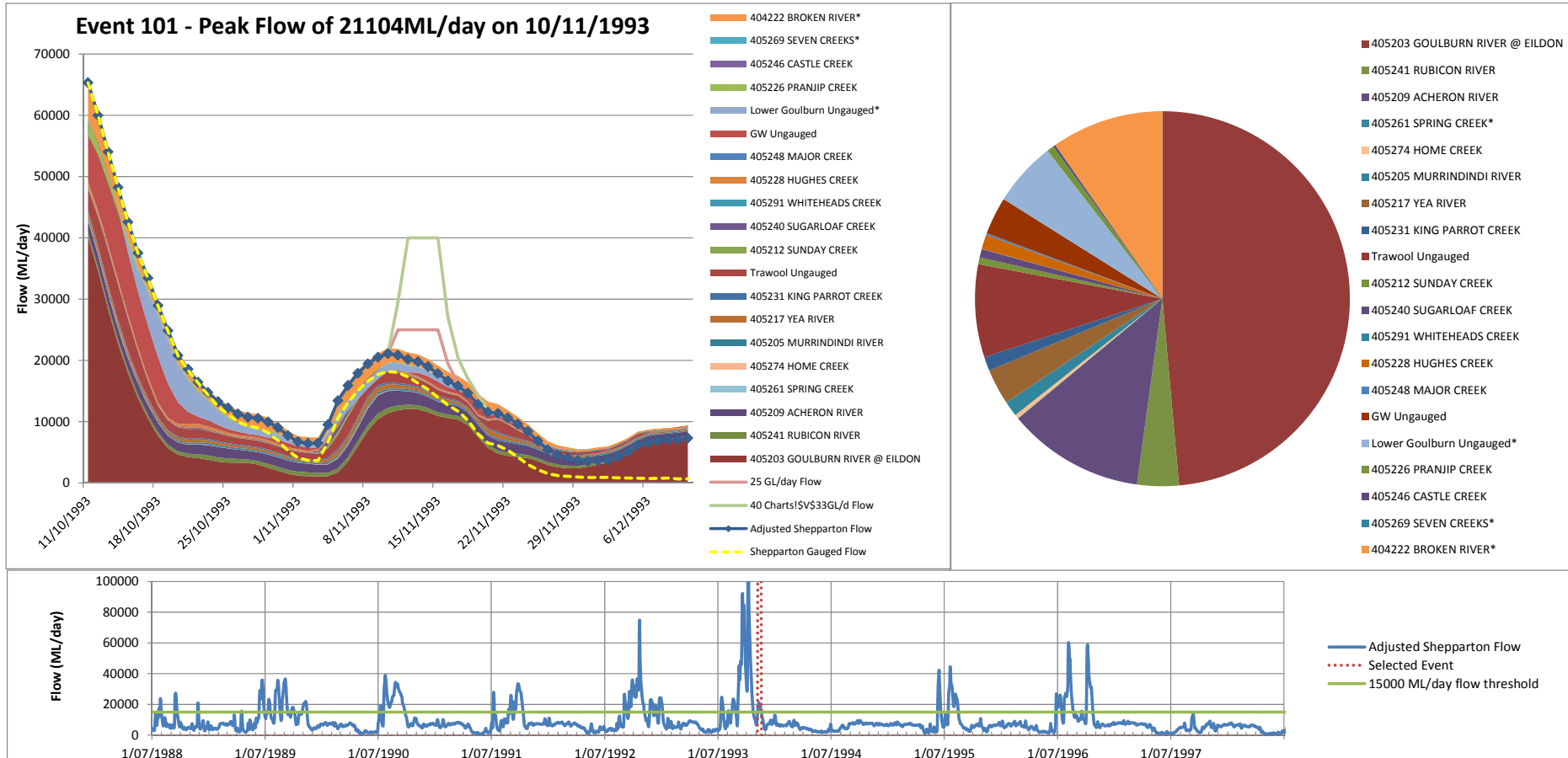




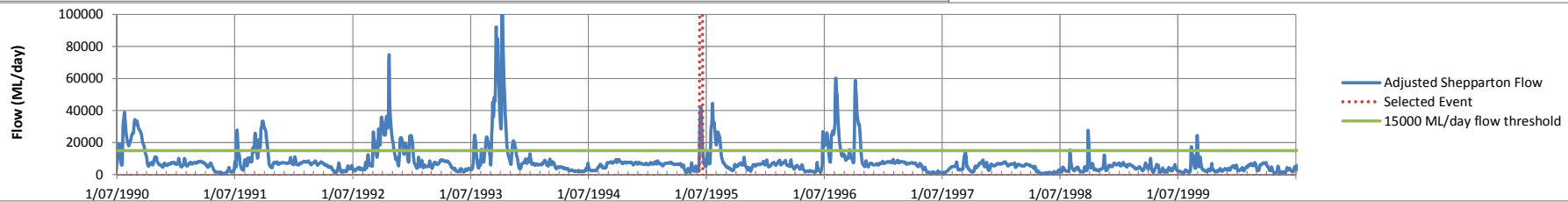
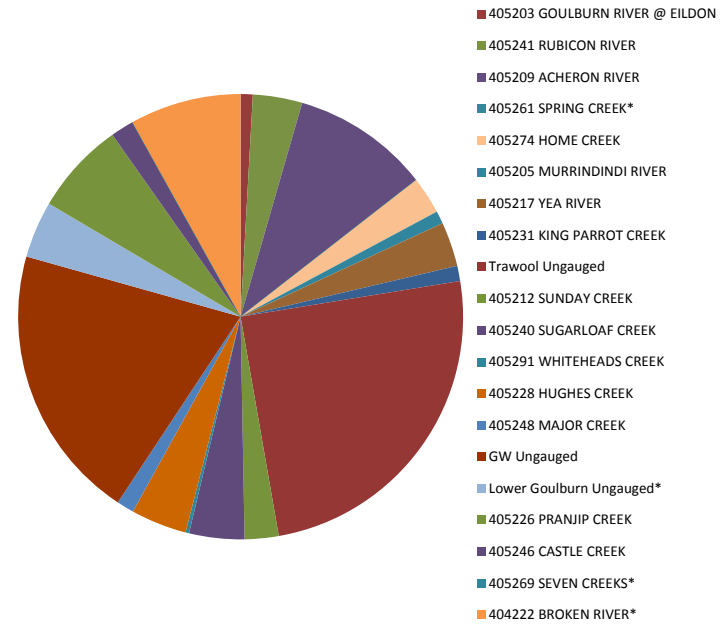
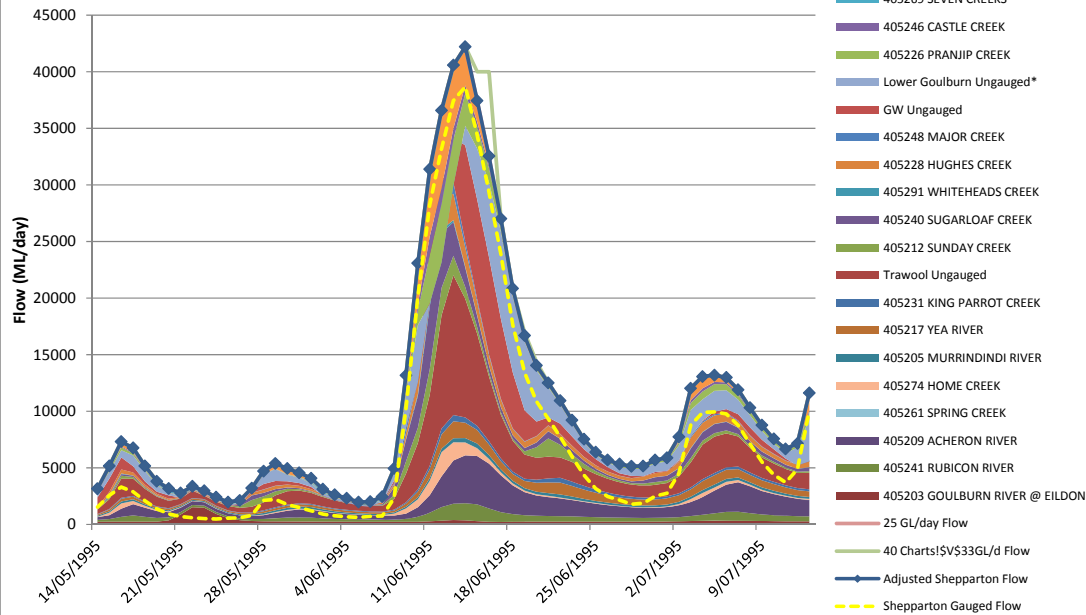


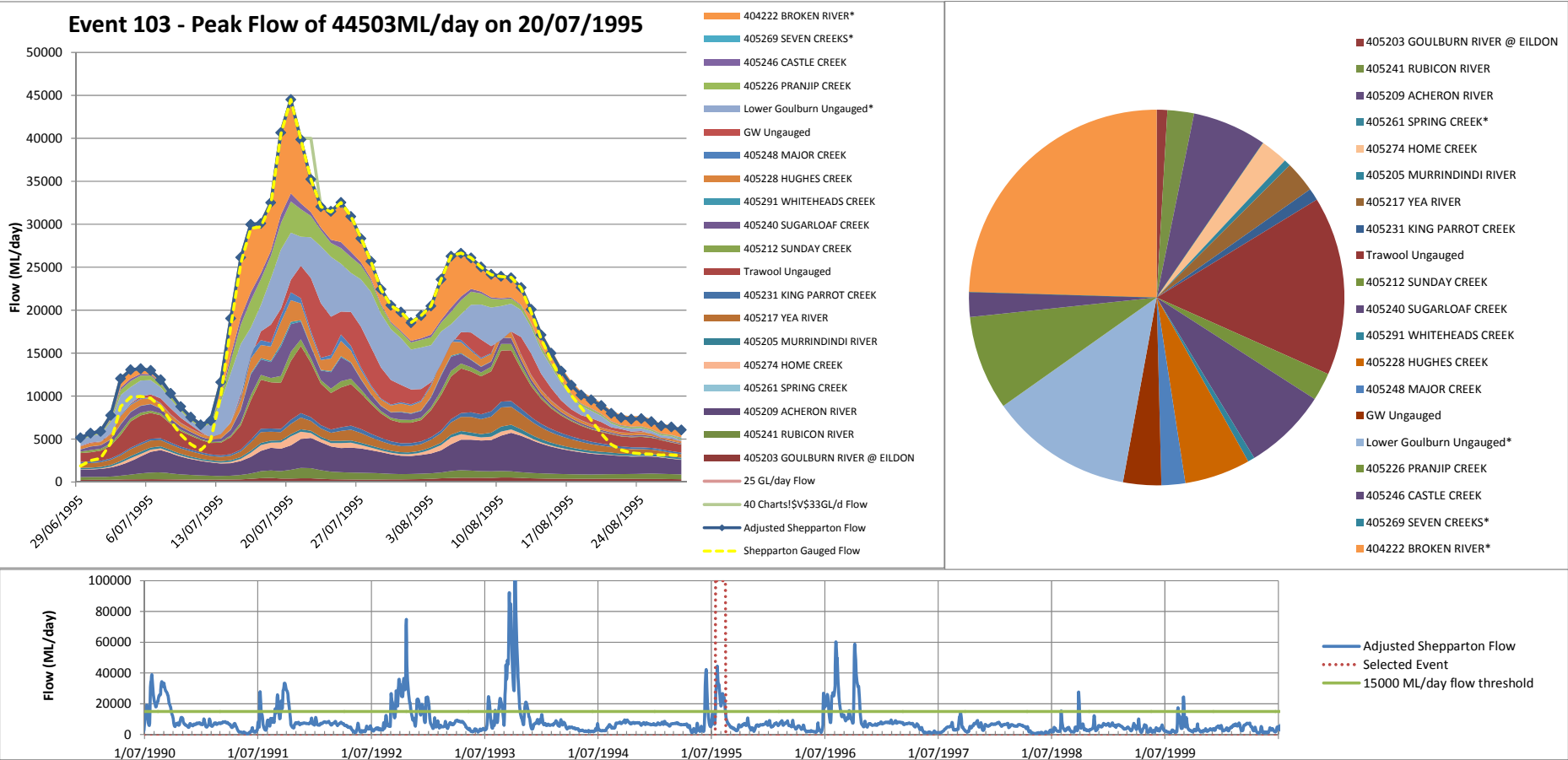


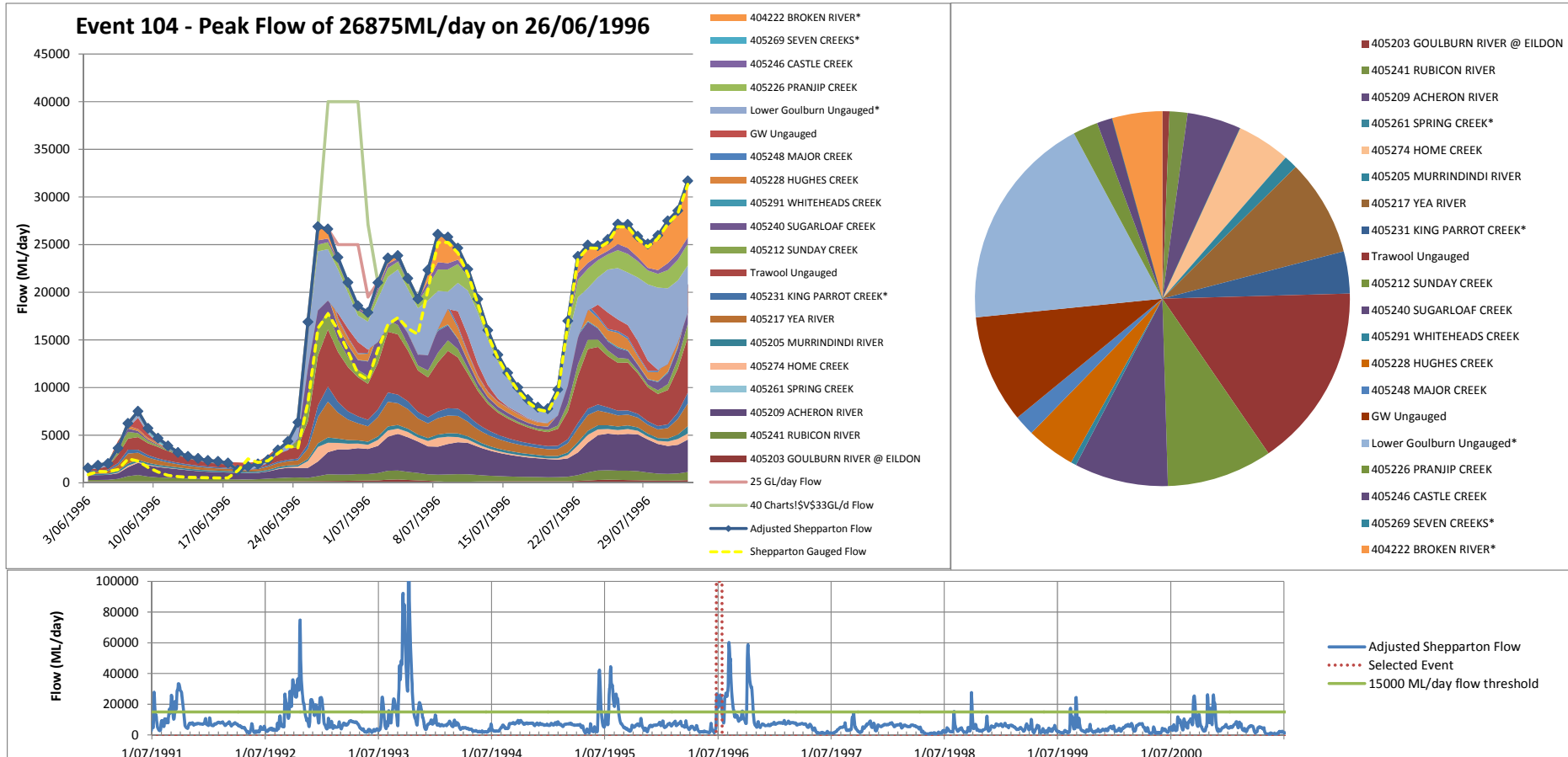




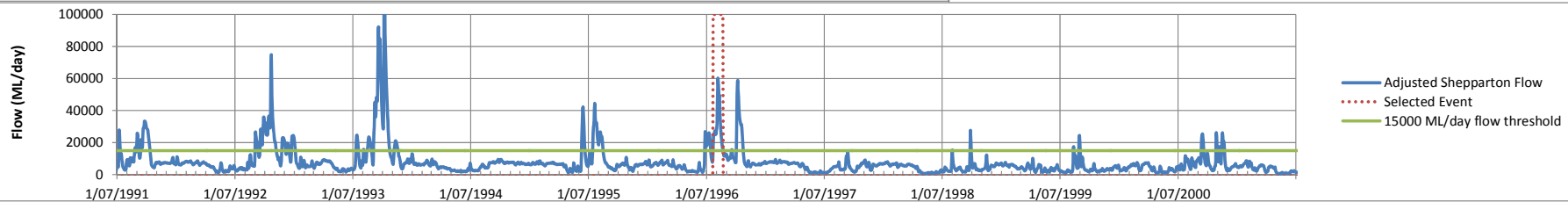
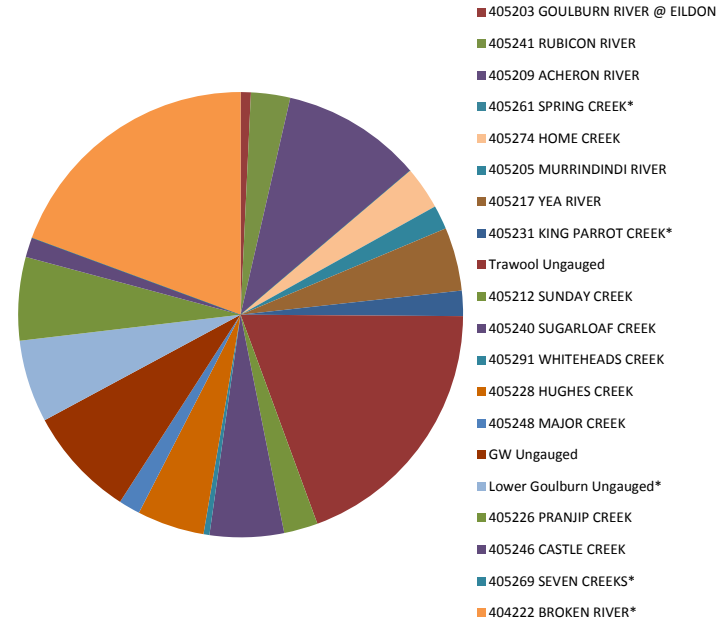
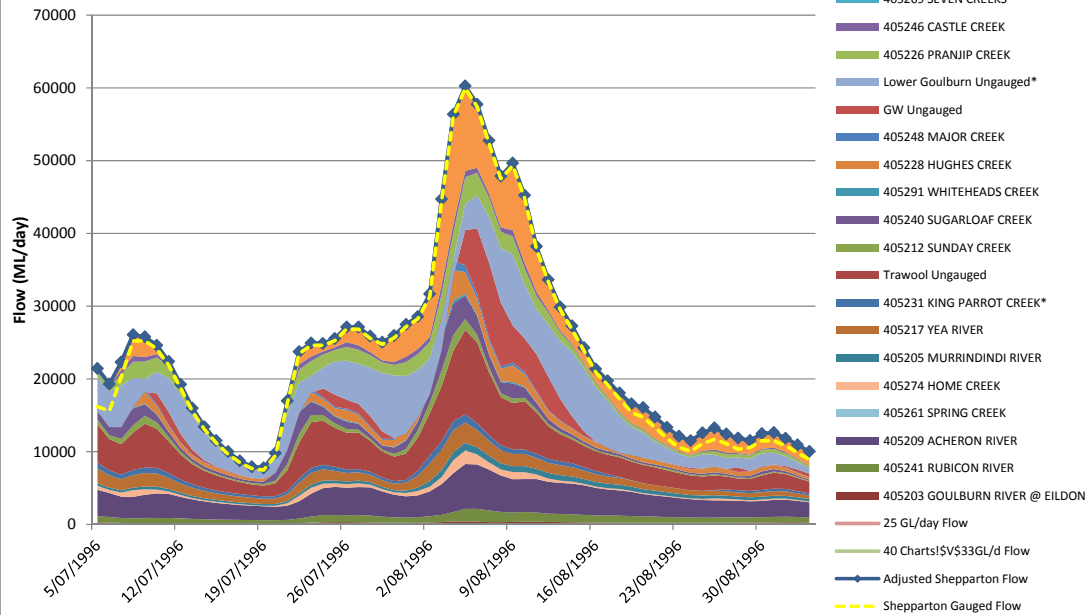
Event 102 - Peak Flow of 42198ML/day on 14/06/1995



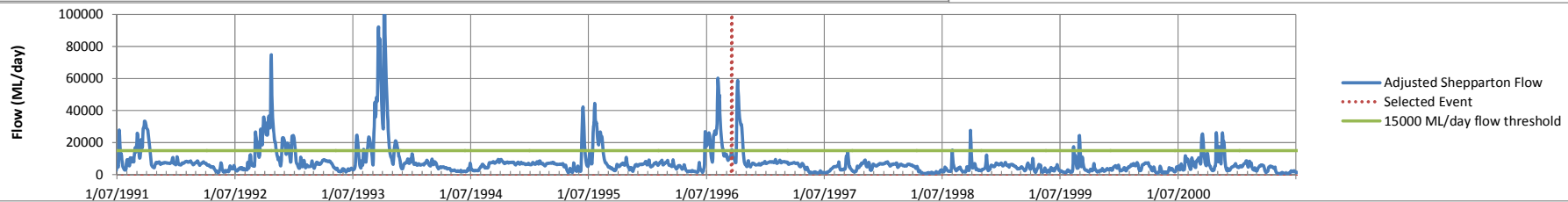
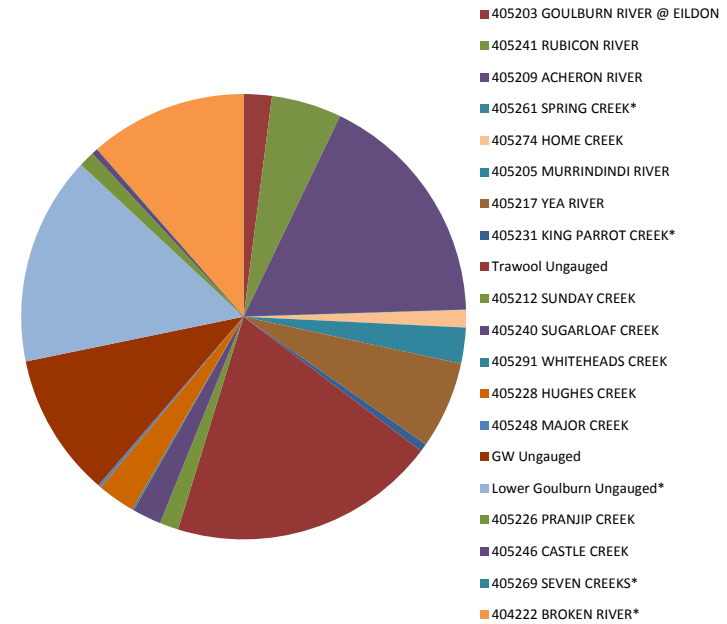
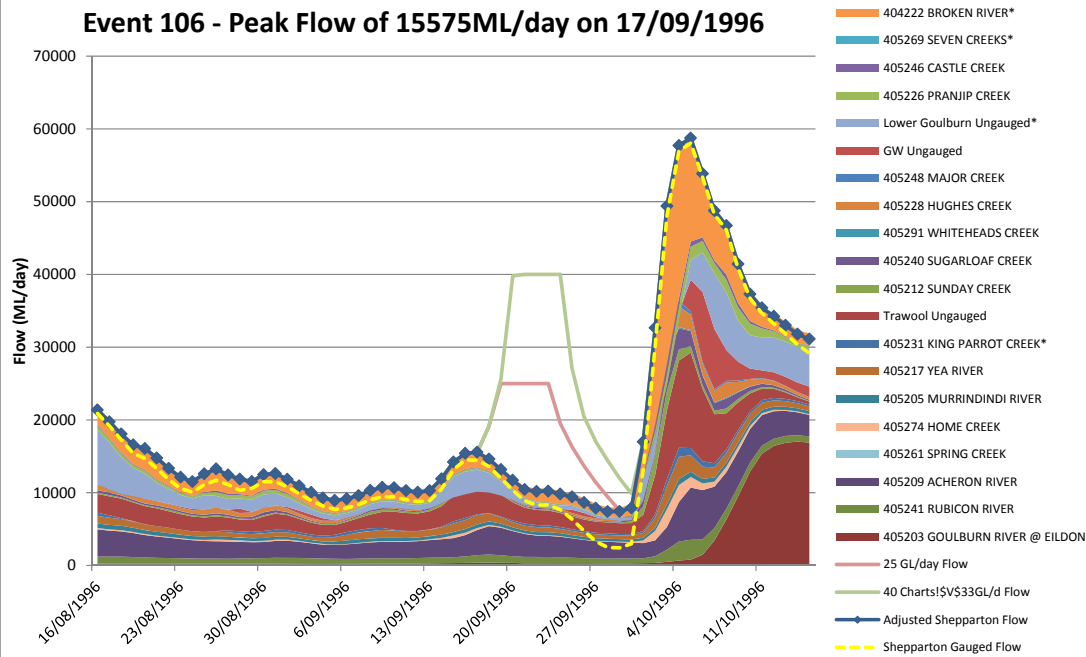


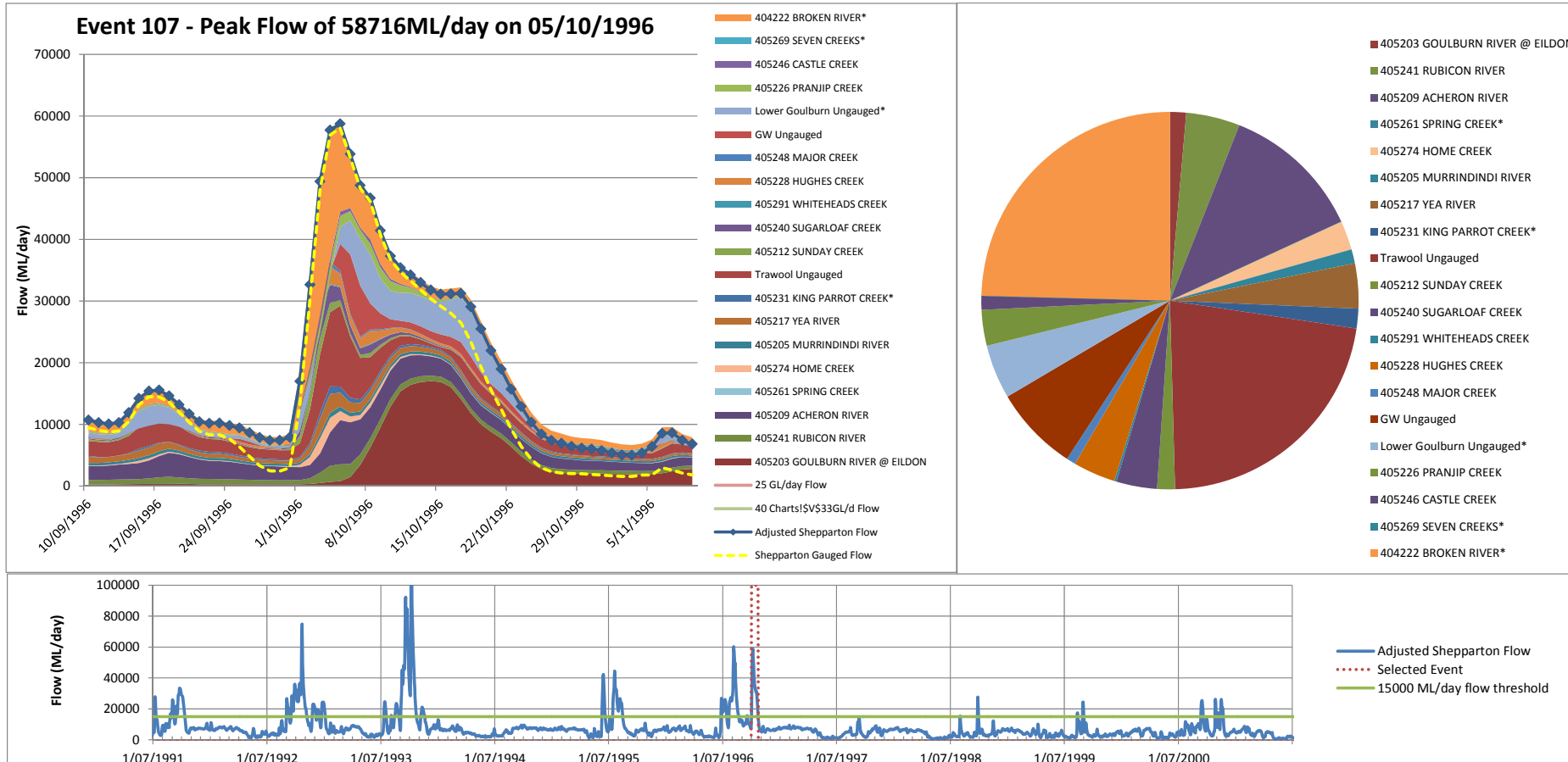


Event 105 - Peak Flow of 60253ML/day on 05/08/1996

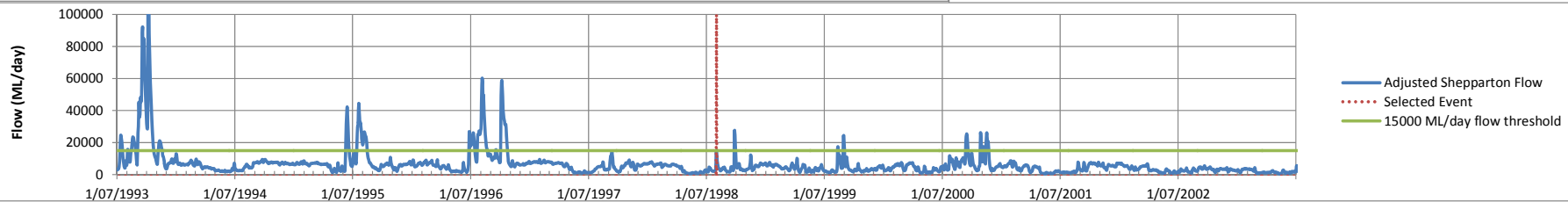
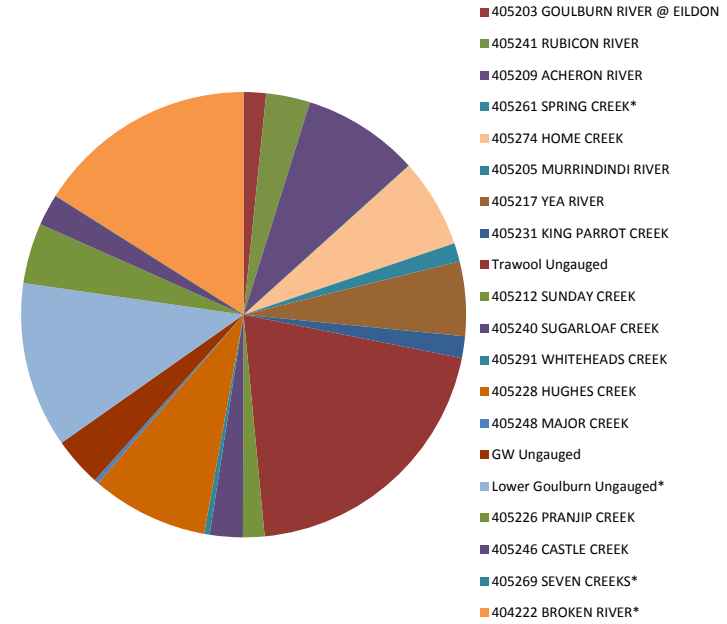
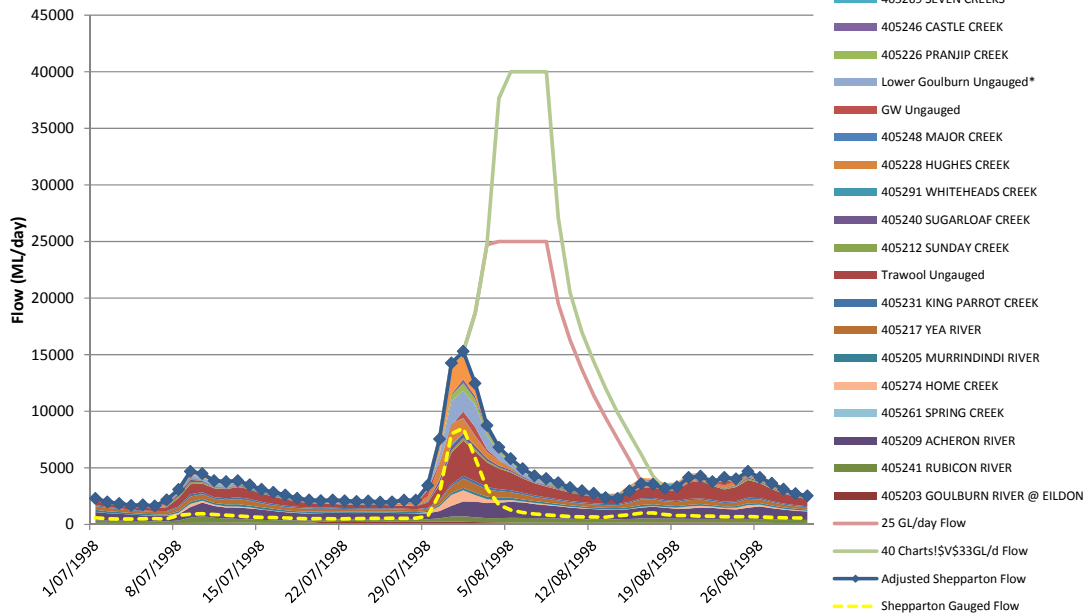


Event 106 - Peak Flow of 15575ML/day on 17/09/1996

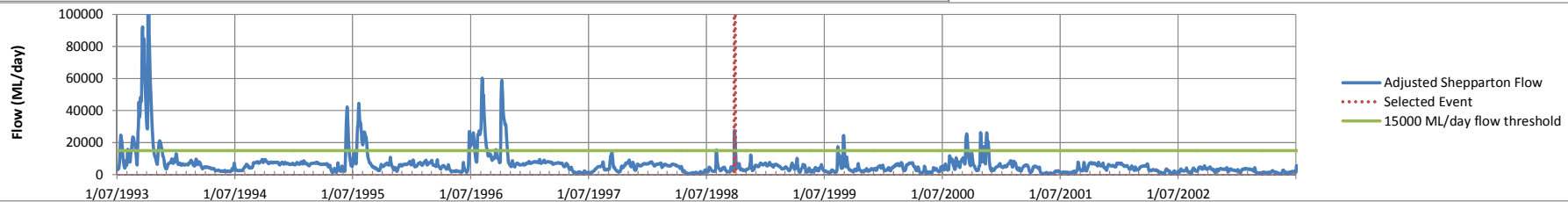
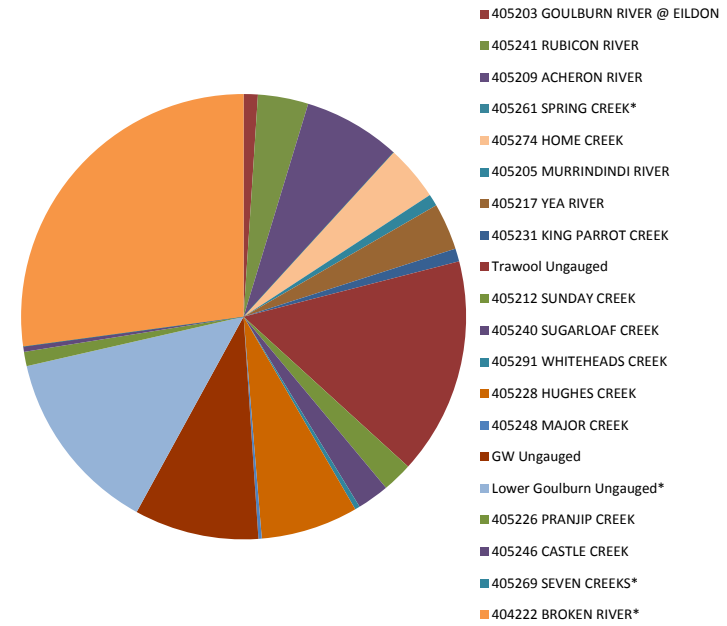
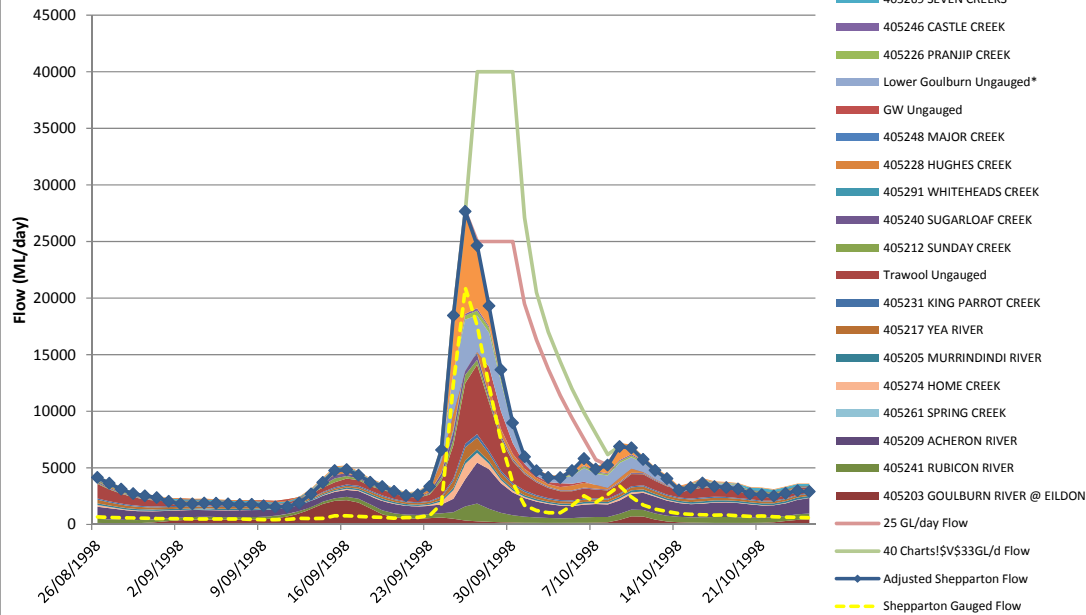




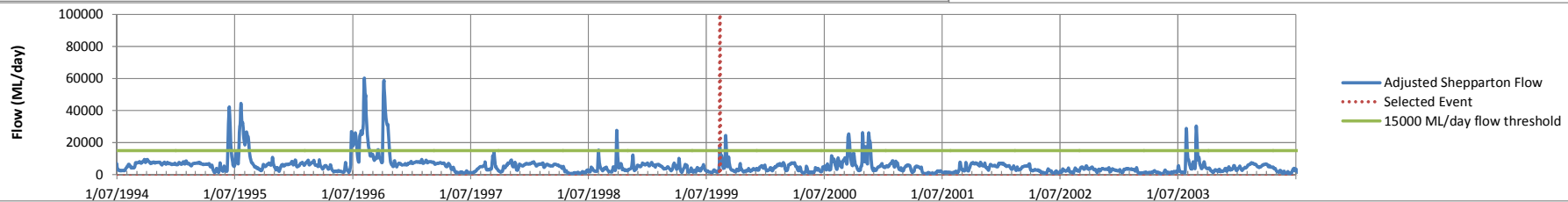
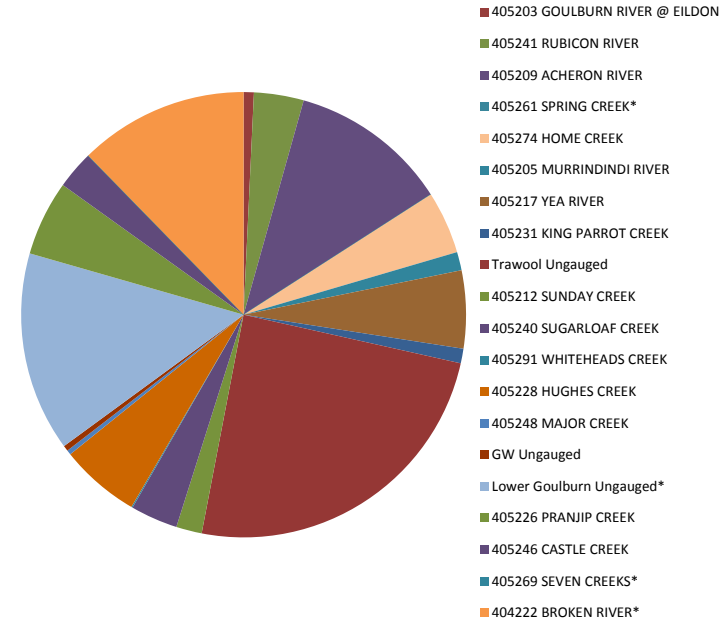
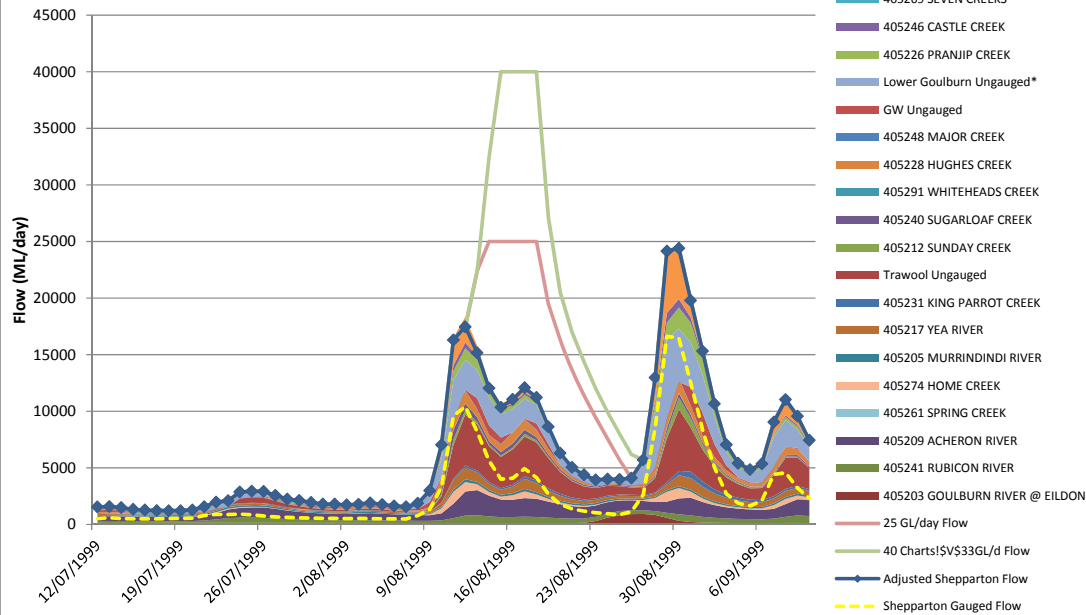
Event 108 - Peak Flow of 15292ML/day on 01/08/1998



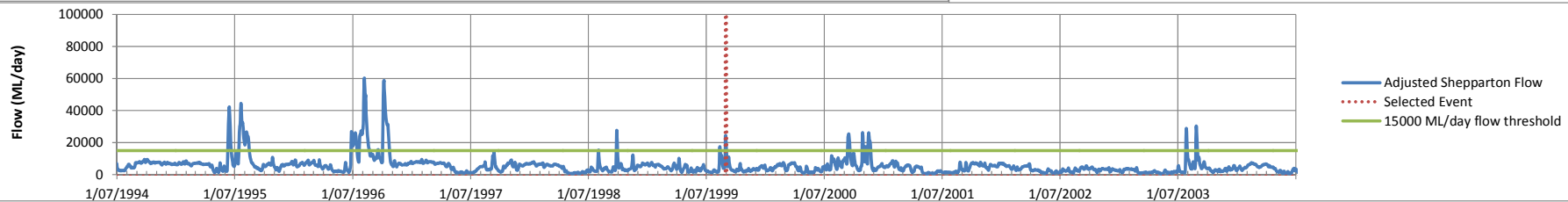
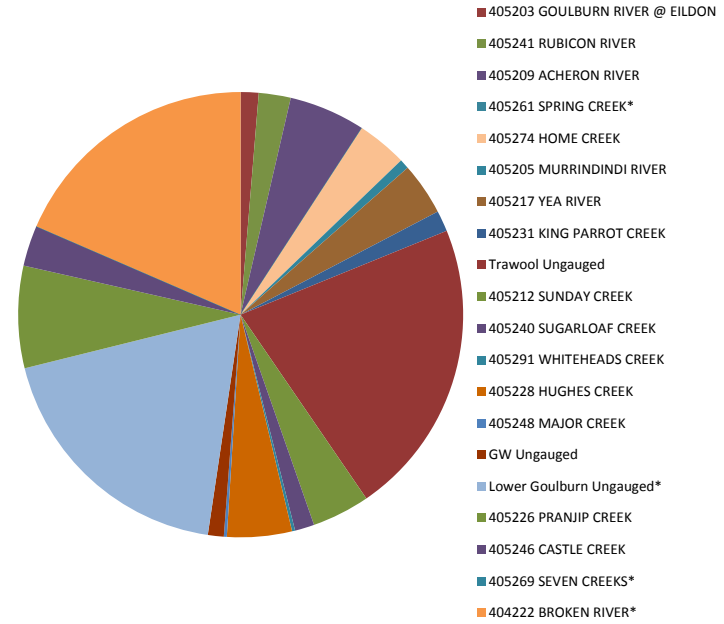
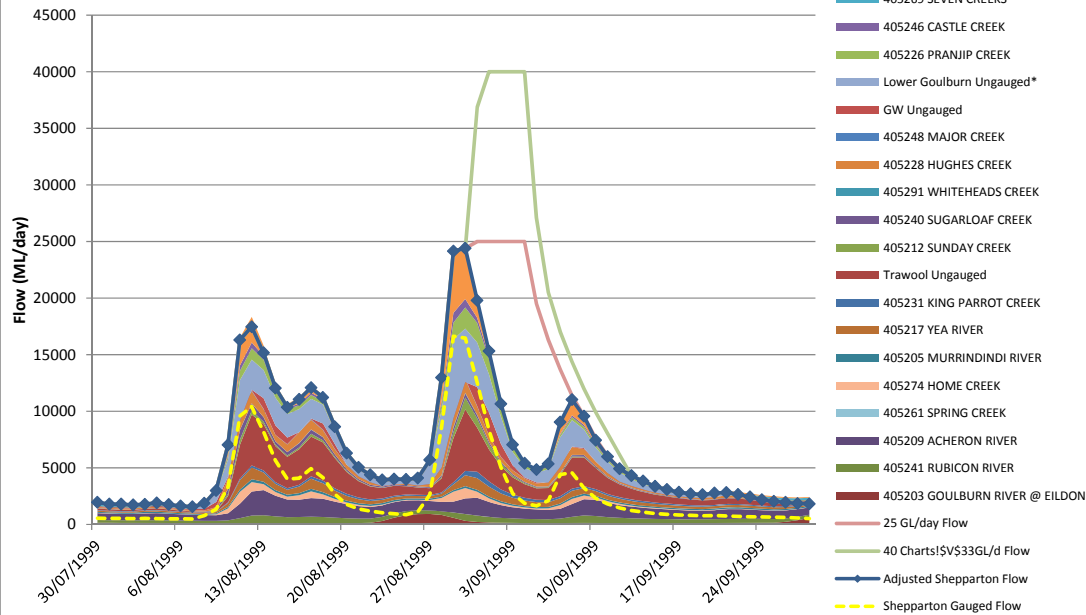
Event 109 - Peak Flow of 27658ML/day on 26/09/1998



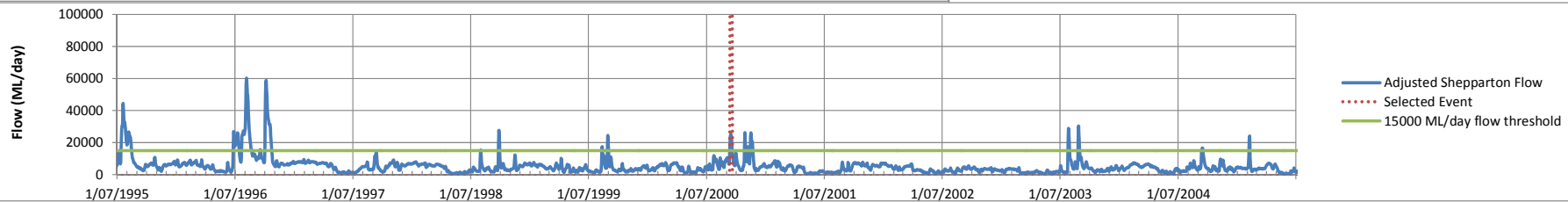
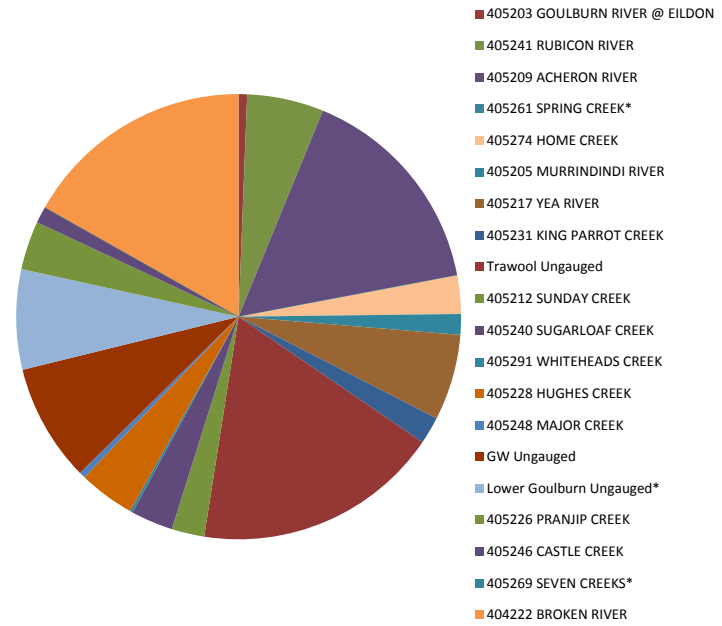
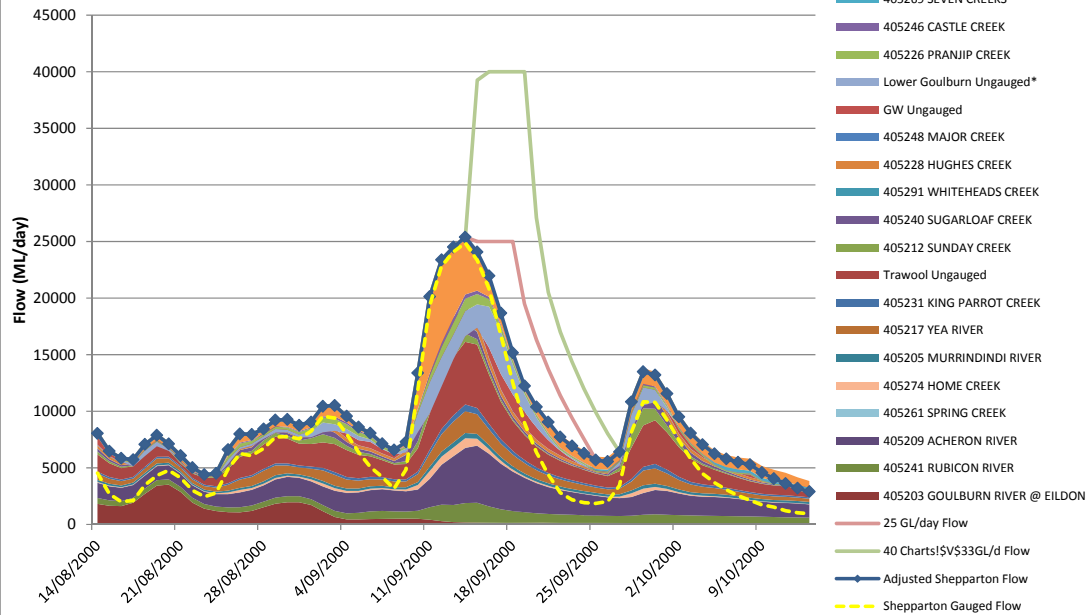
Event 110 - Peak Flow of 17462ML/day on 12/08/1999

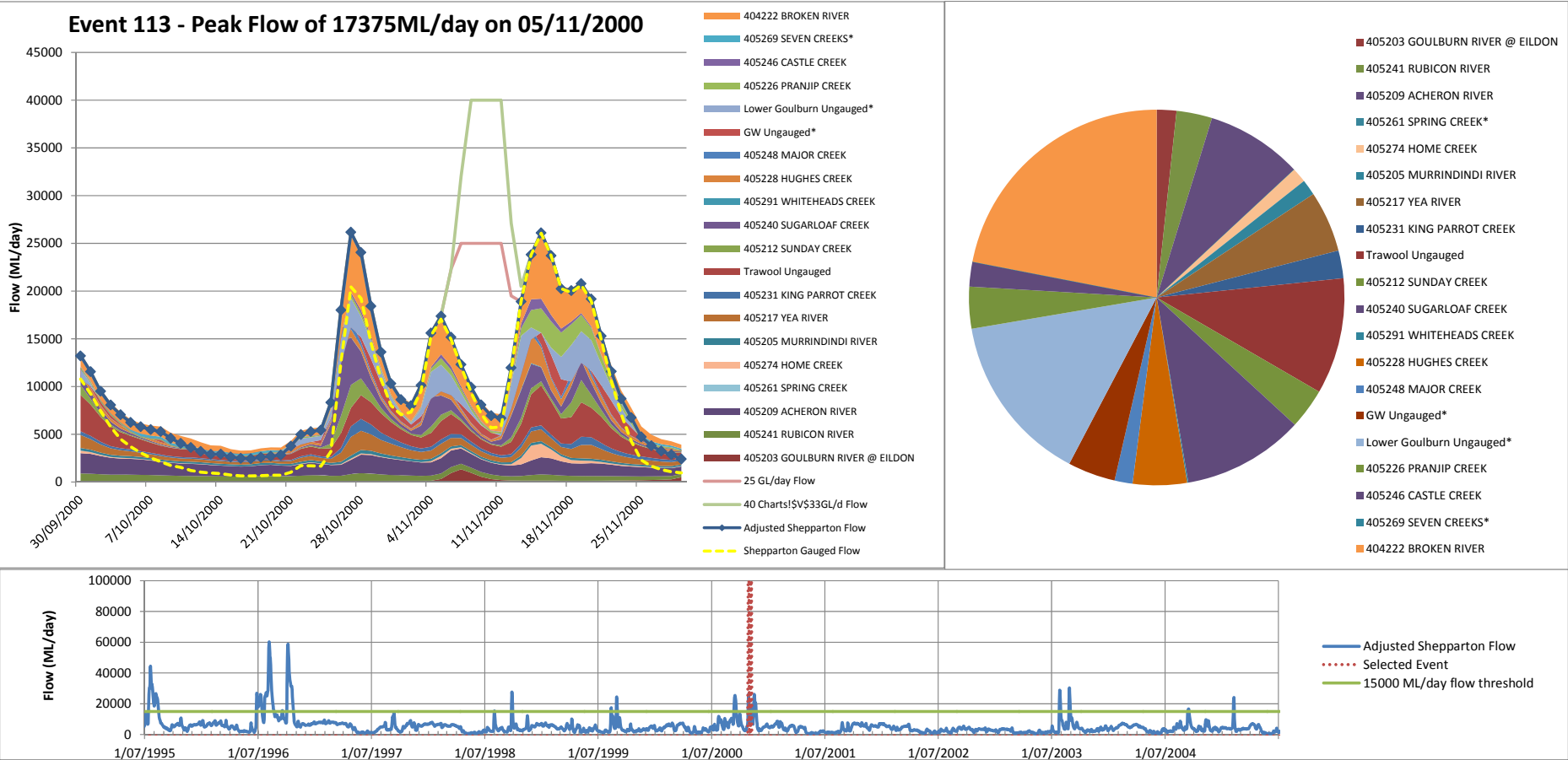


Event 111 - Peak Flow of 24397ML/day on 30/08/1999

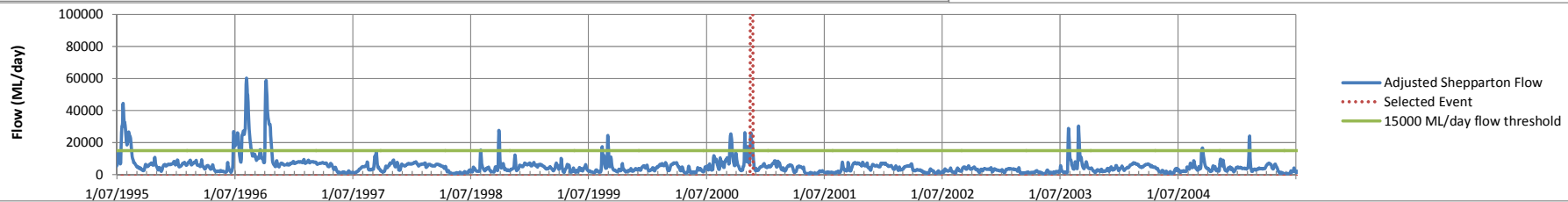
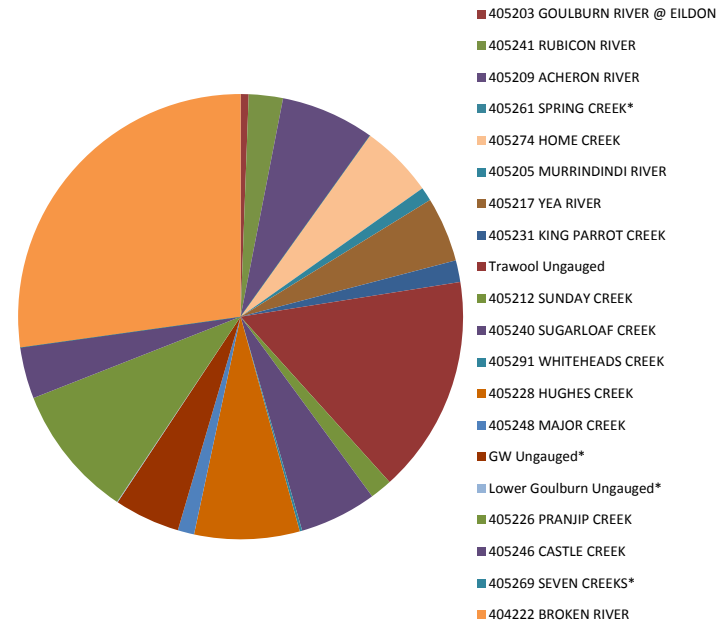
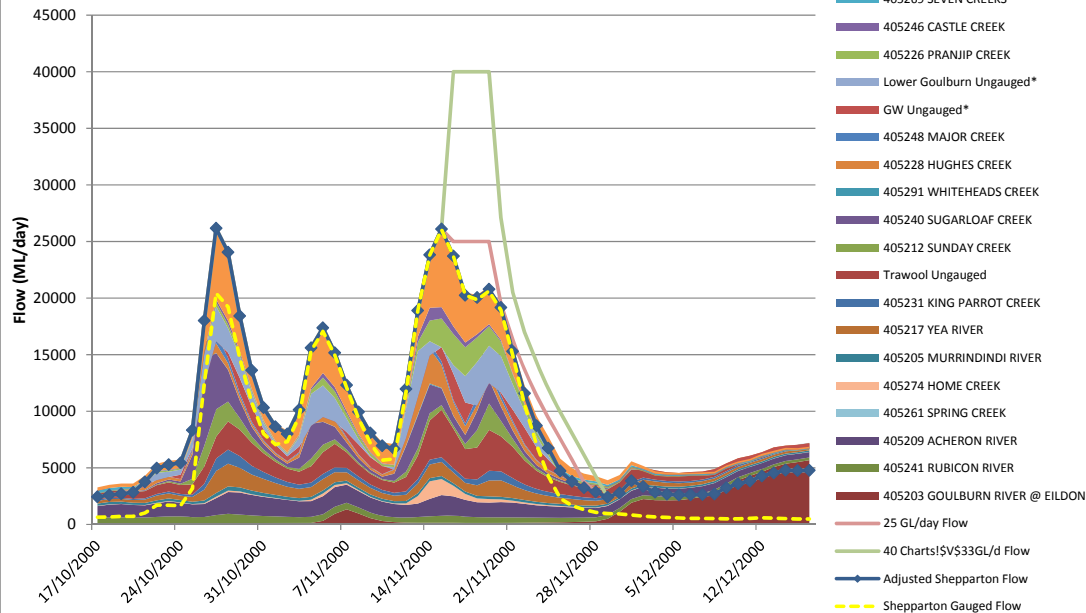


Event 112 - Peak Flow of 25390ML/day on 14/09/2000

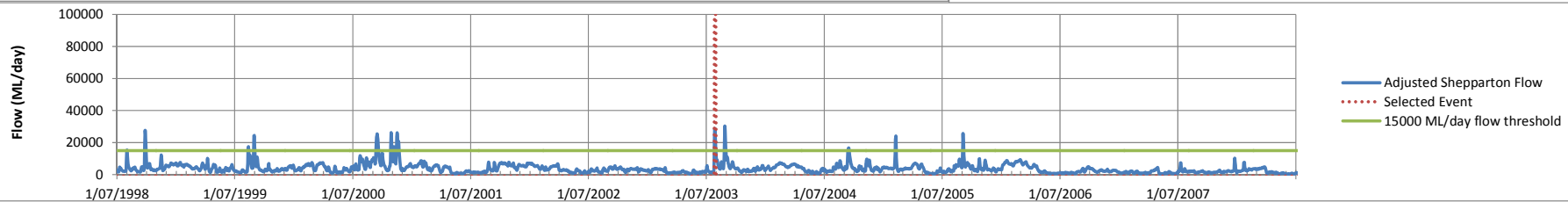
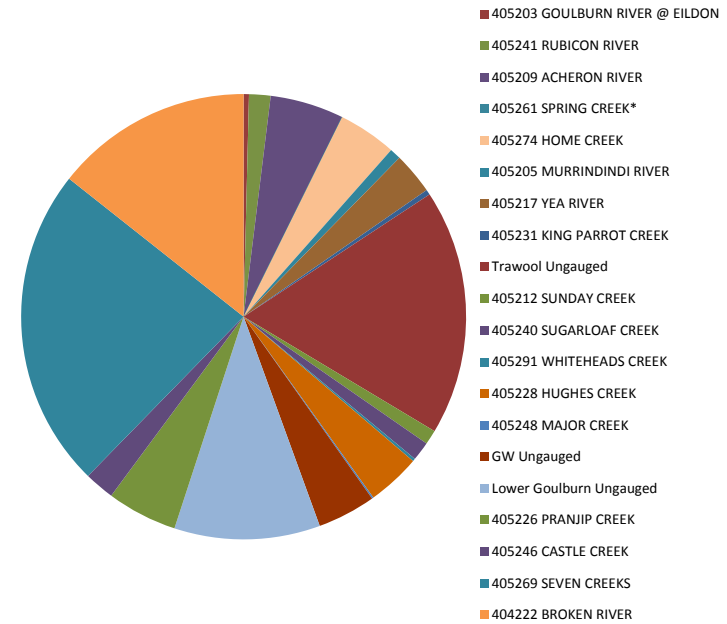
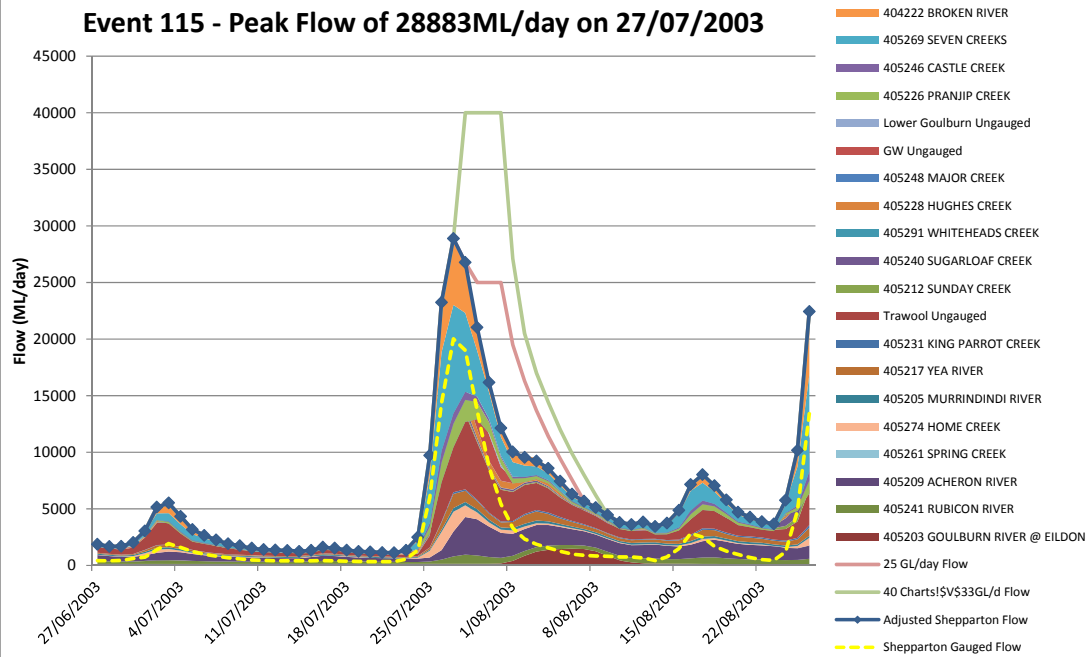




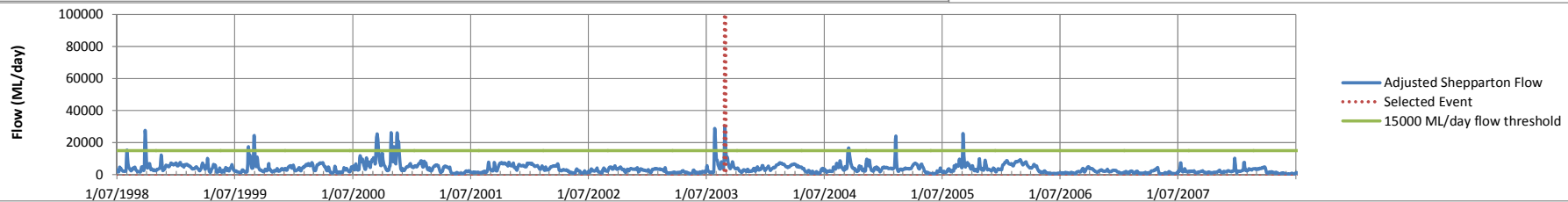
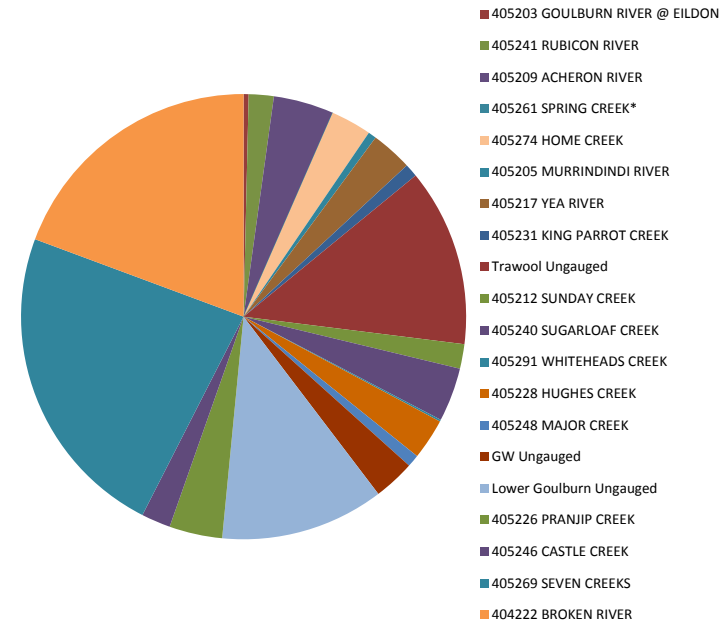
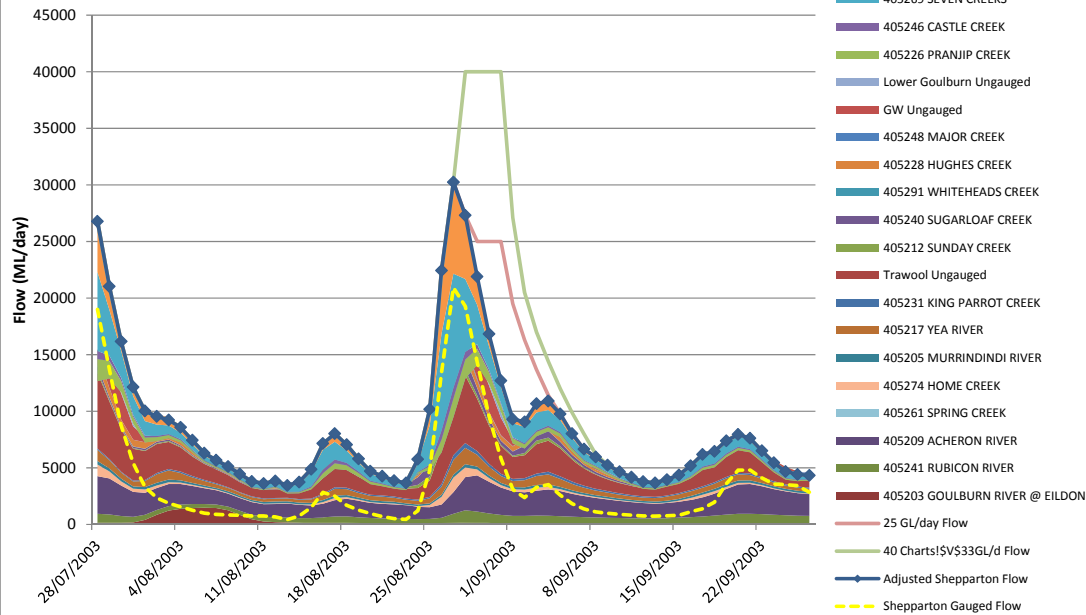
Event 114 - Peak Flow of 26103ML/day on 15/11/2000



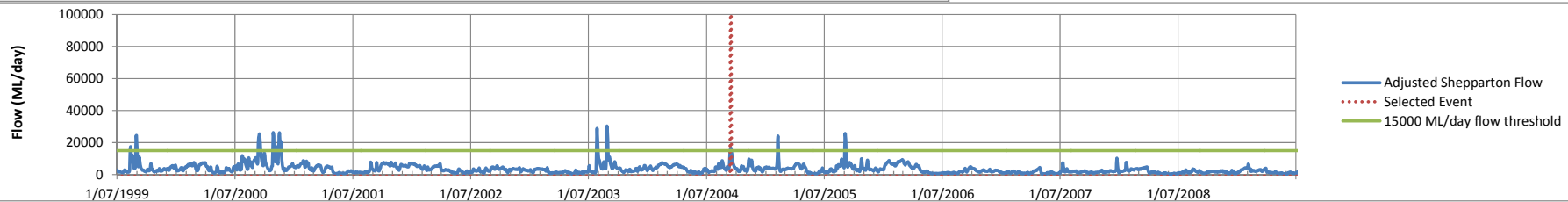
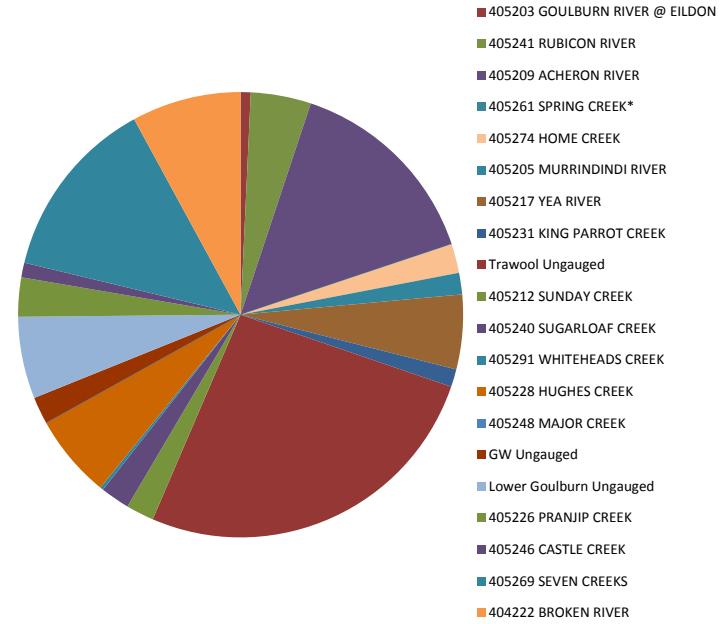
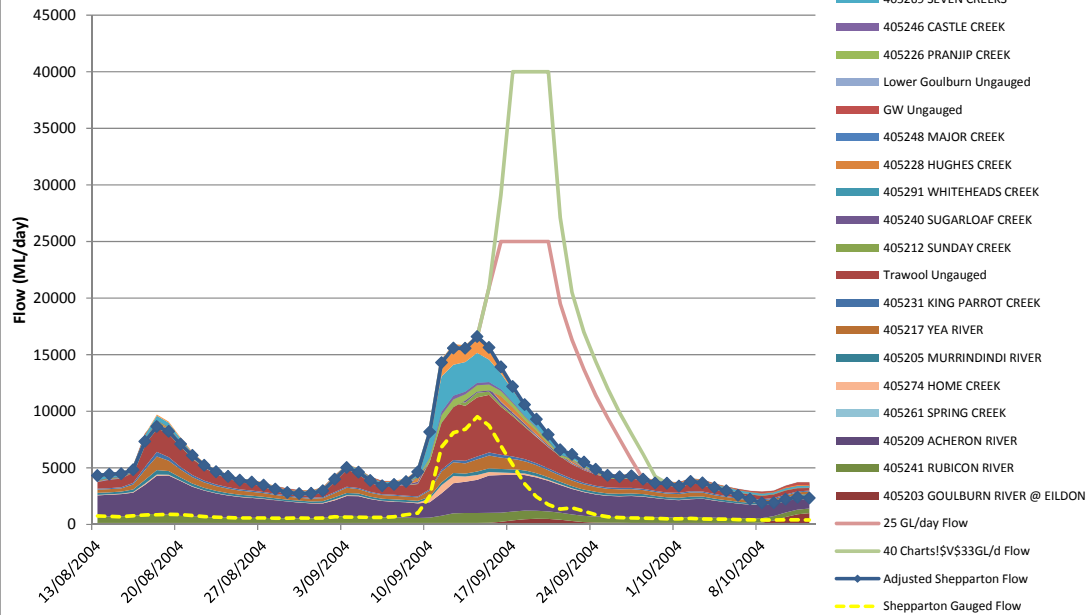
Event 115 - Peak Flow of 28883ML/day on 27/07/2003



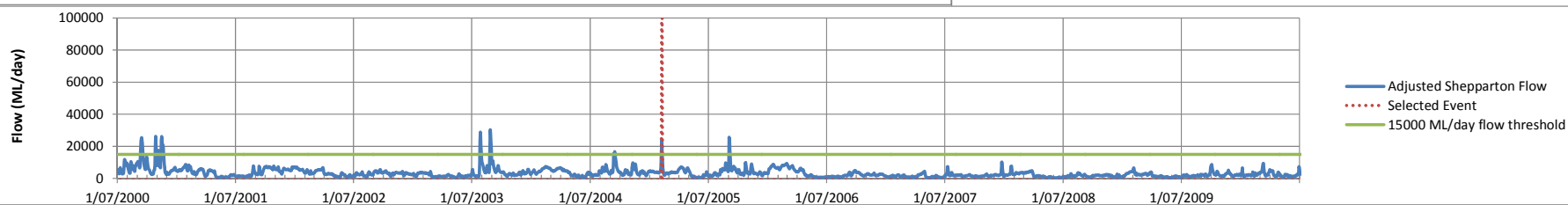
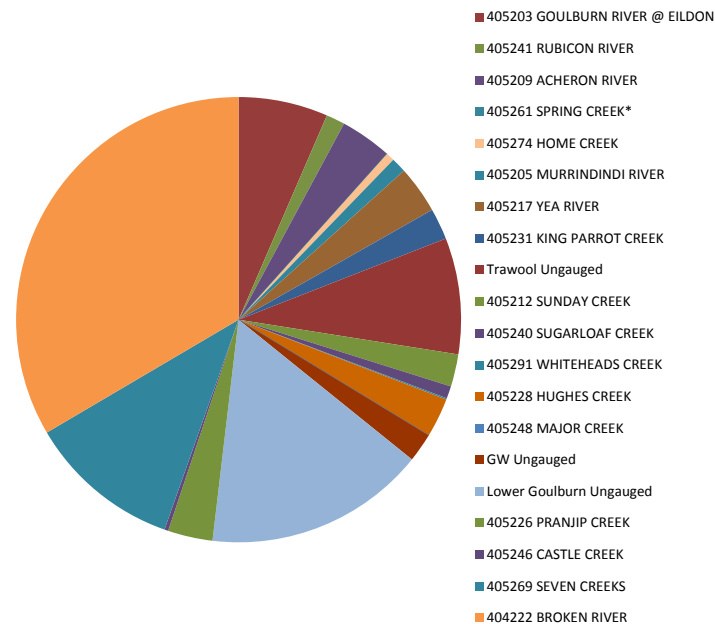
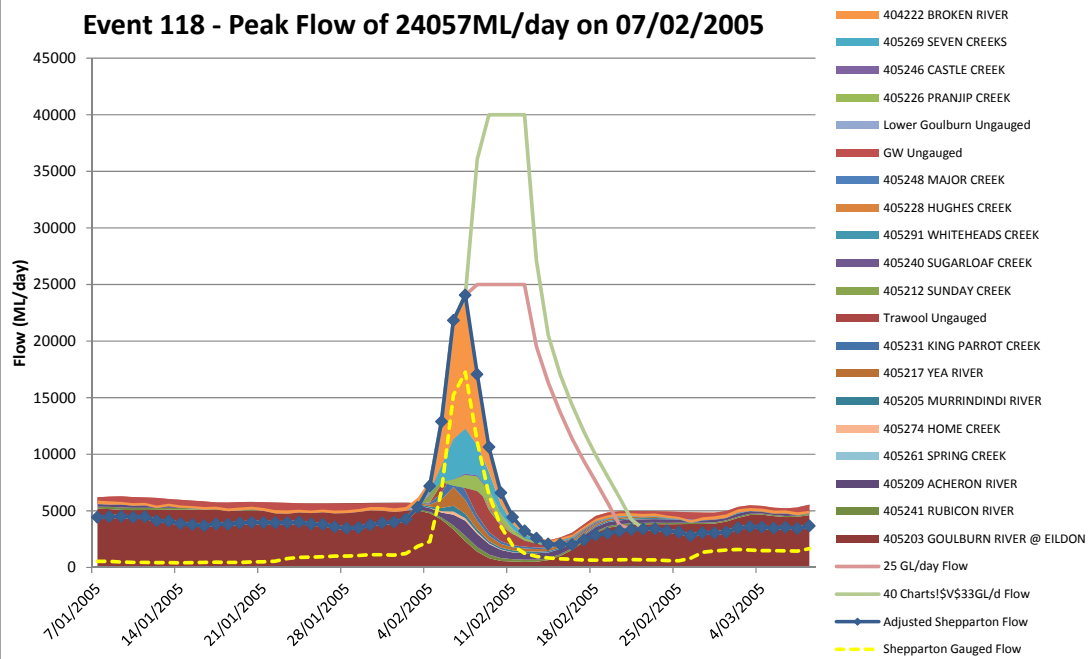
Event 116 - Peak Flow of 30240ML/day on 27/08/2003



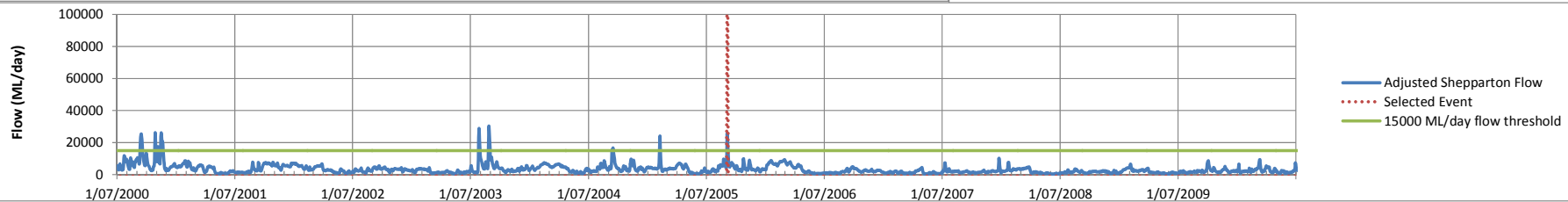
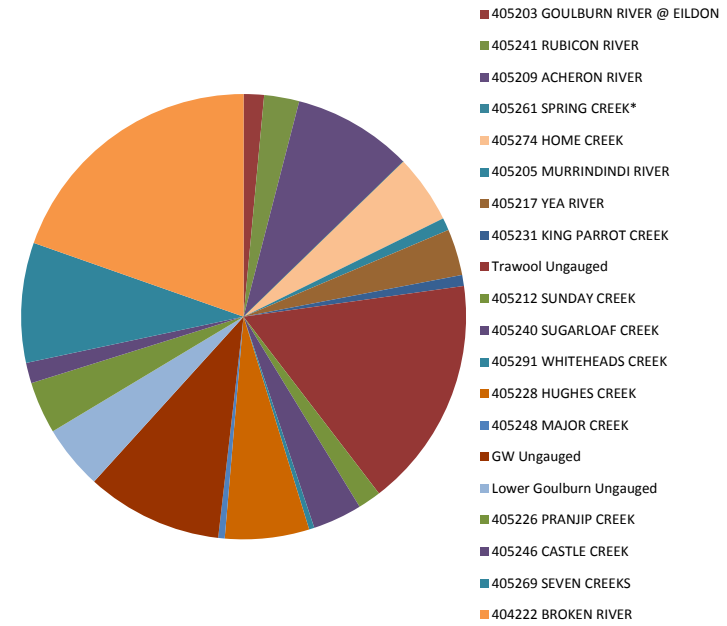
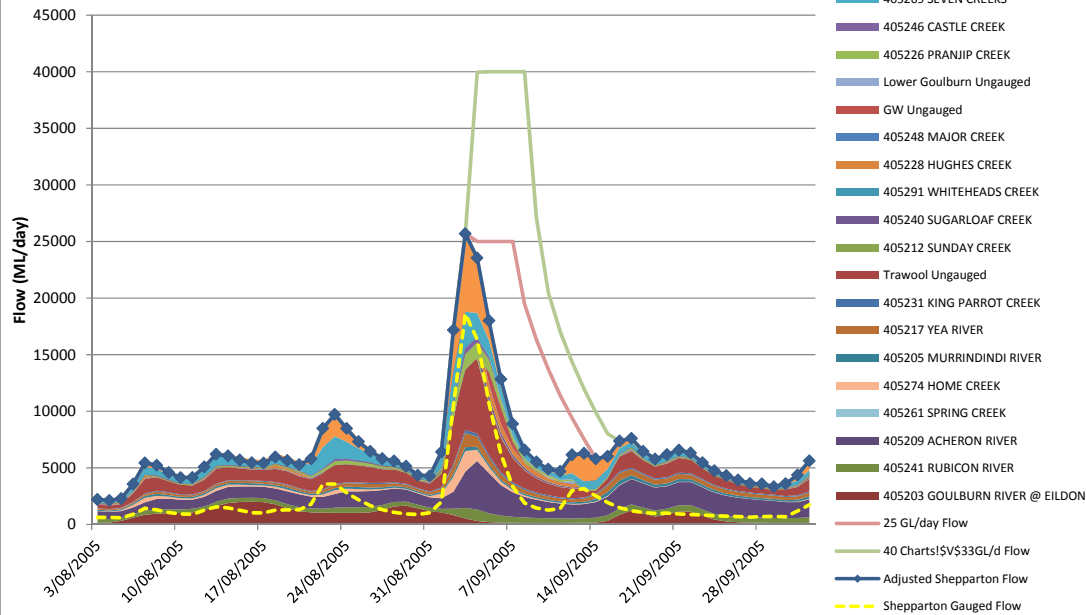
Event 117 - Peak Flow of 16598ML/day on 14/09/2004

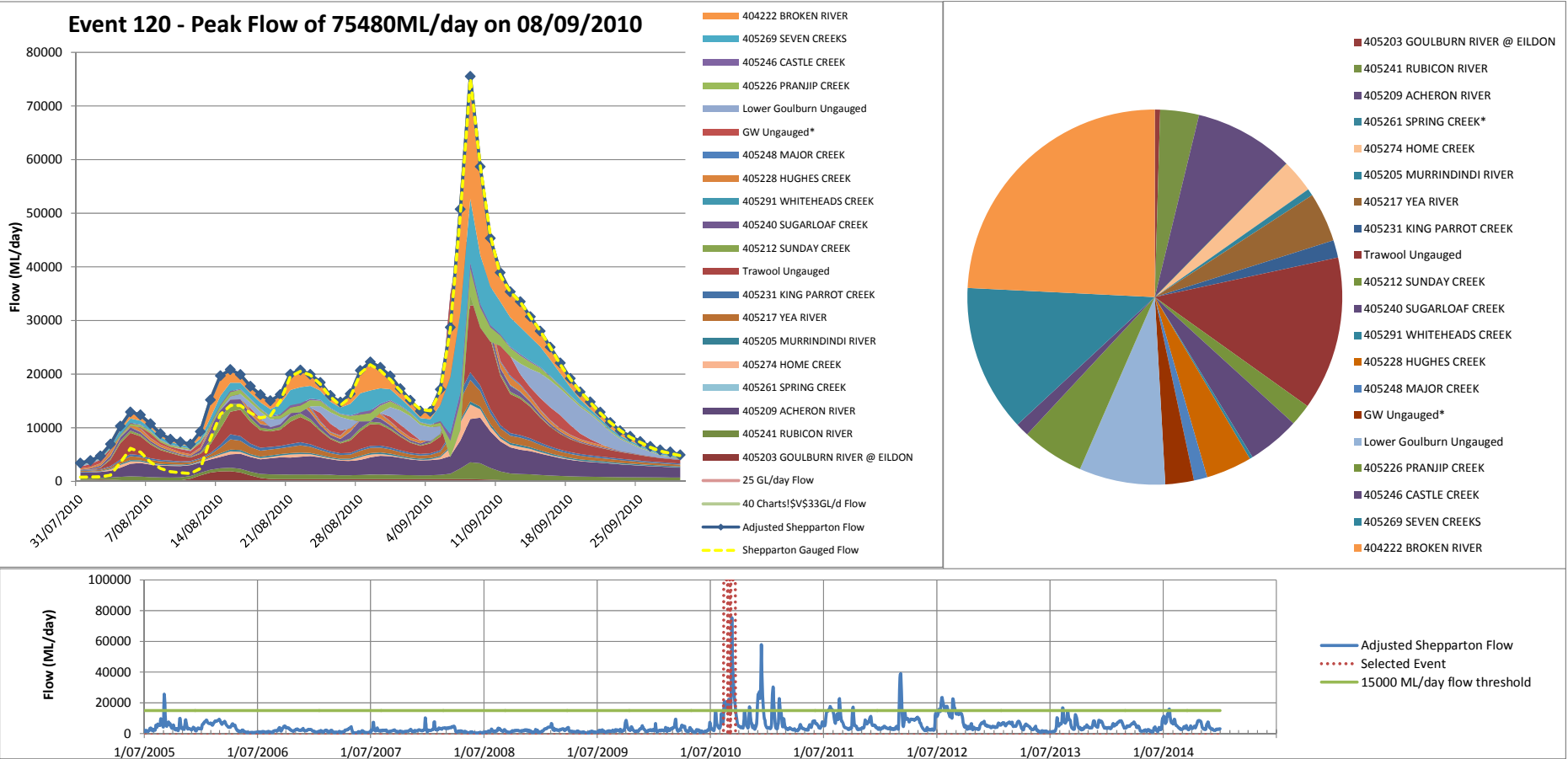


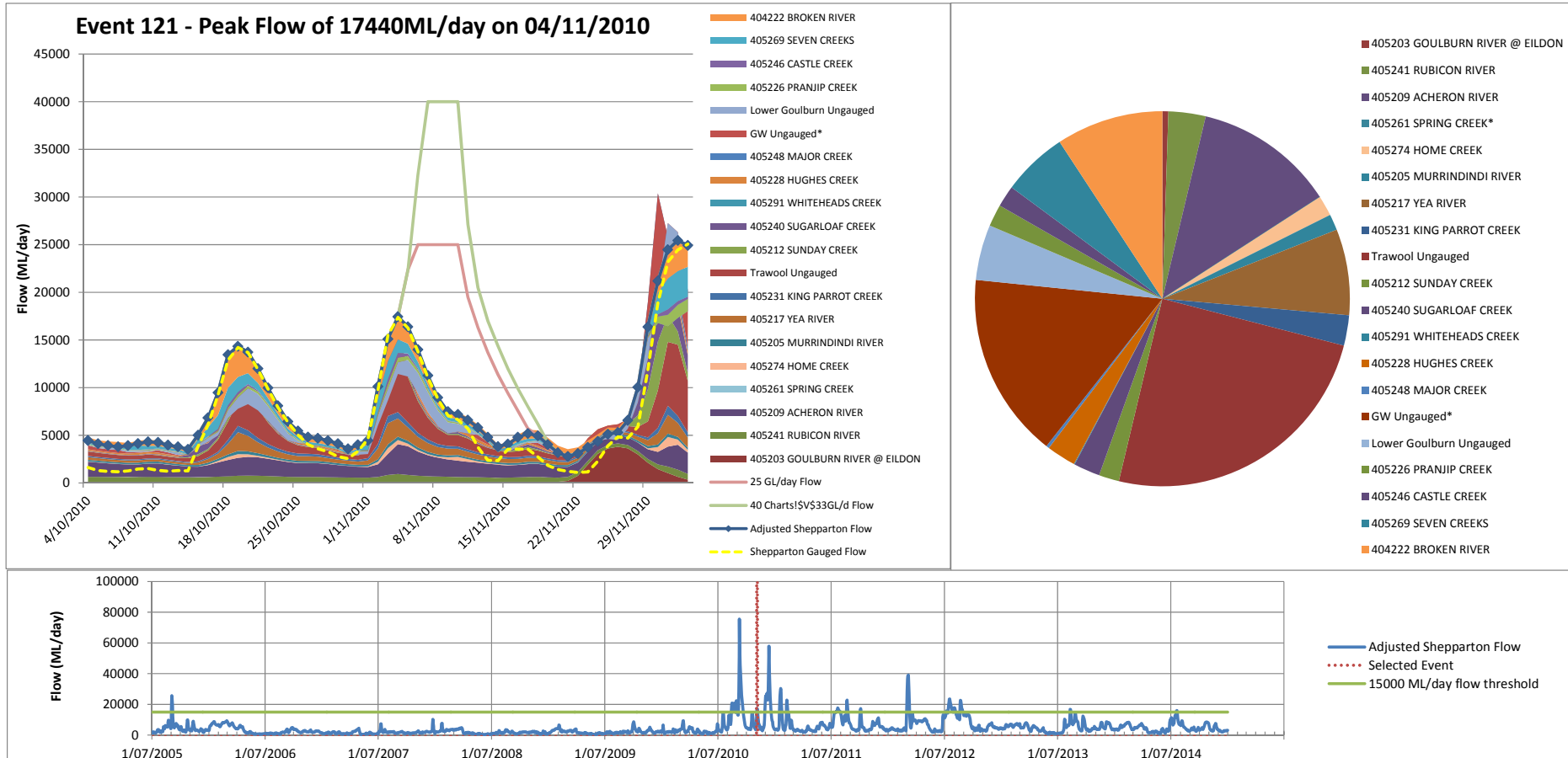
Event 118 - Peak Flow of 24057ML/day on 07/02/2005

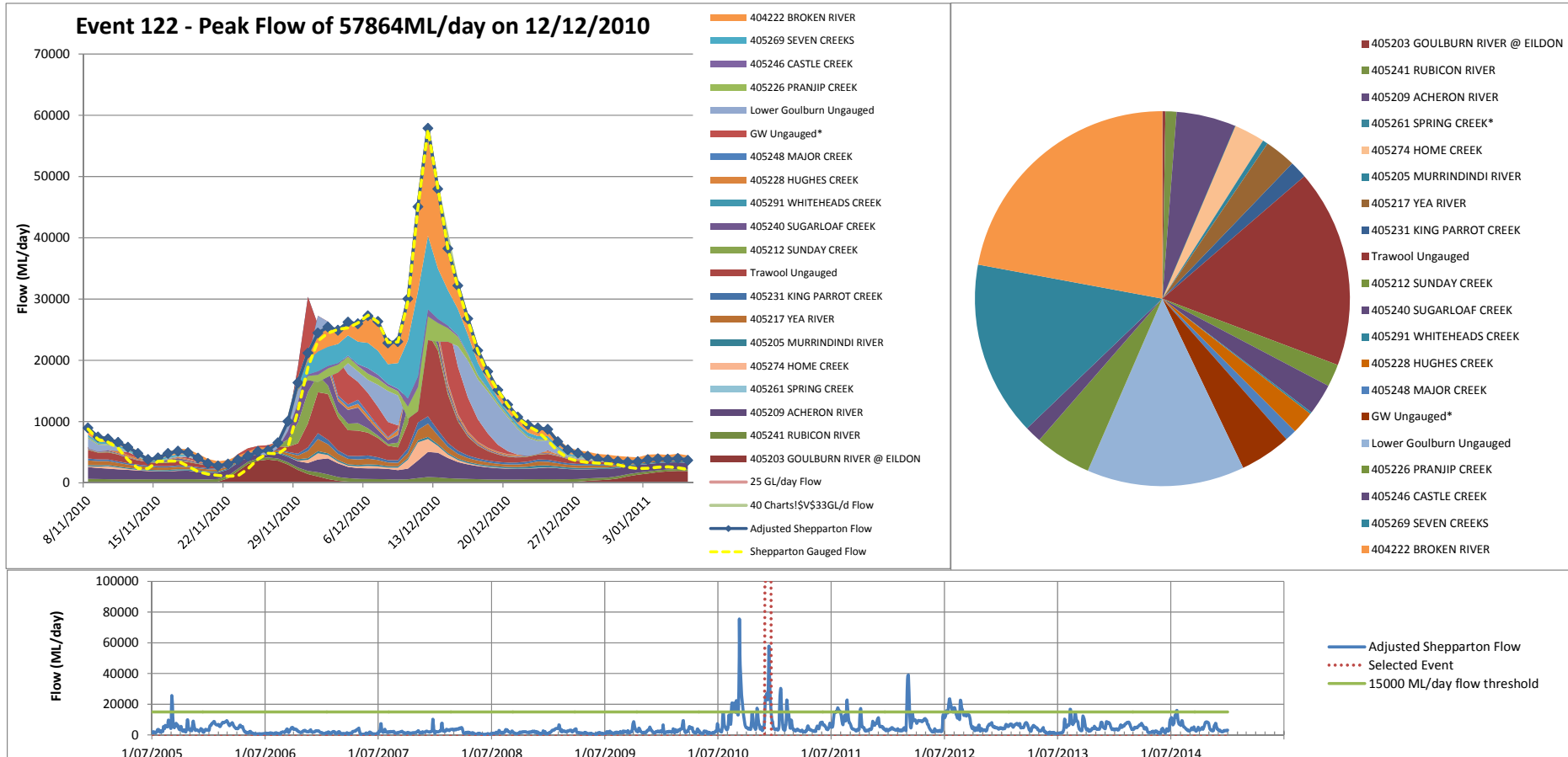


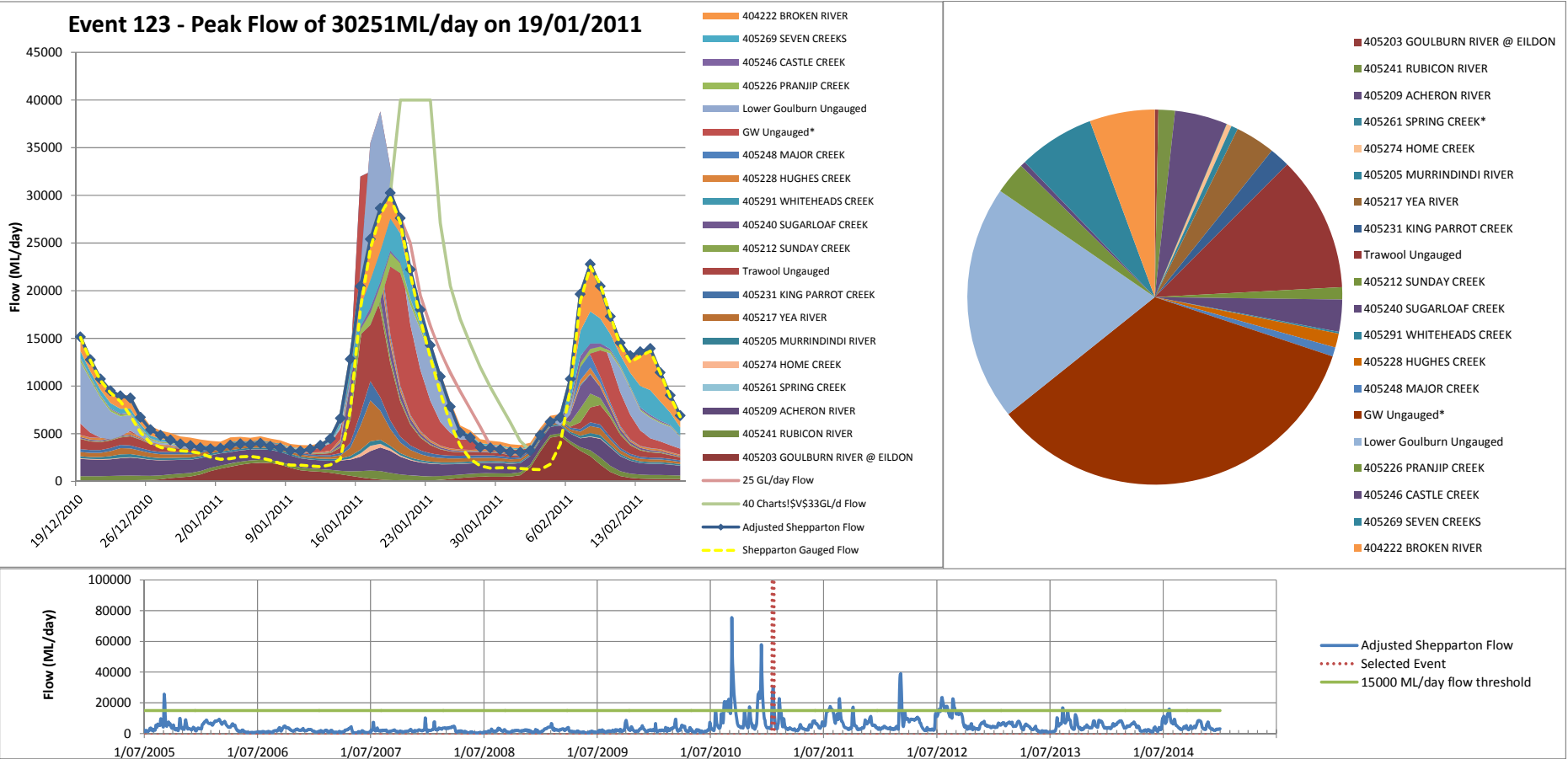
Event 119 - Peak Flow of 25680ML/day on 03/09/2005



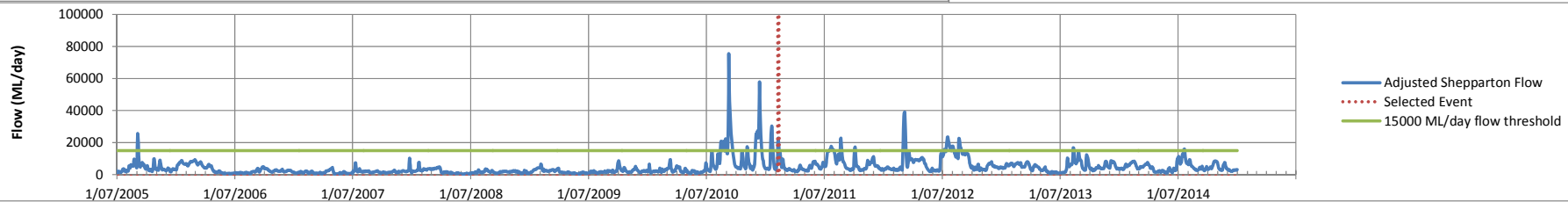
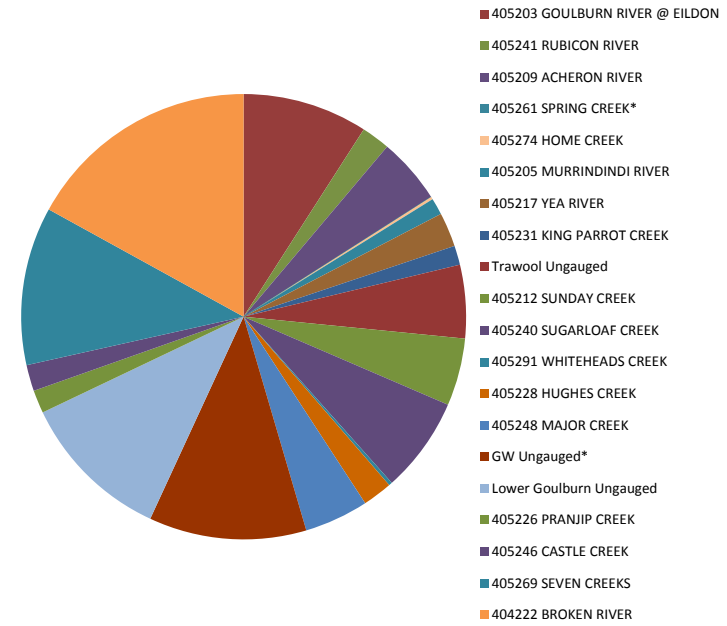
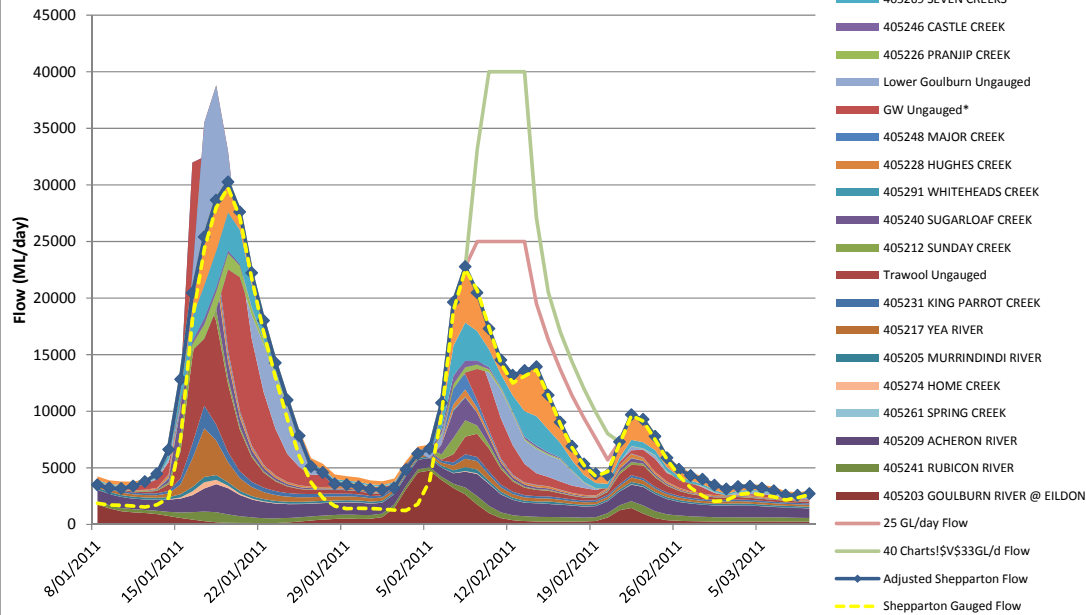




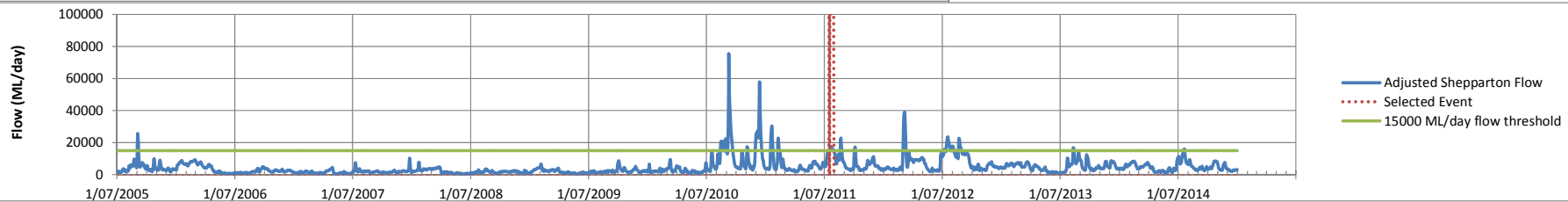
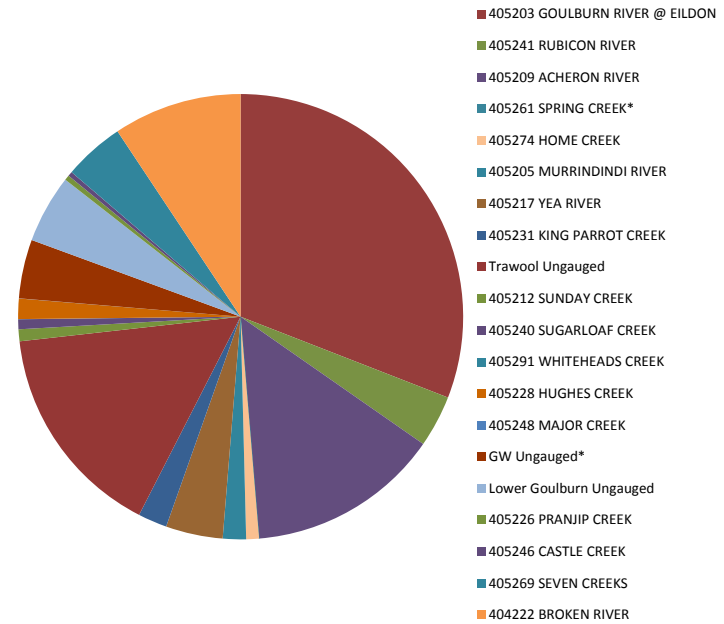
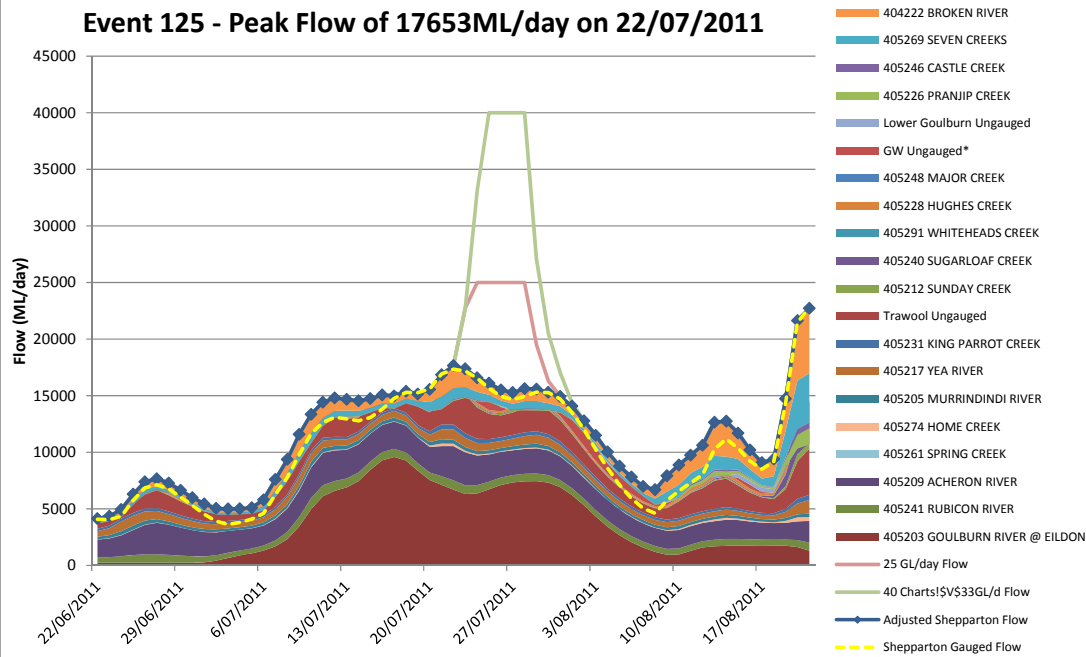




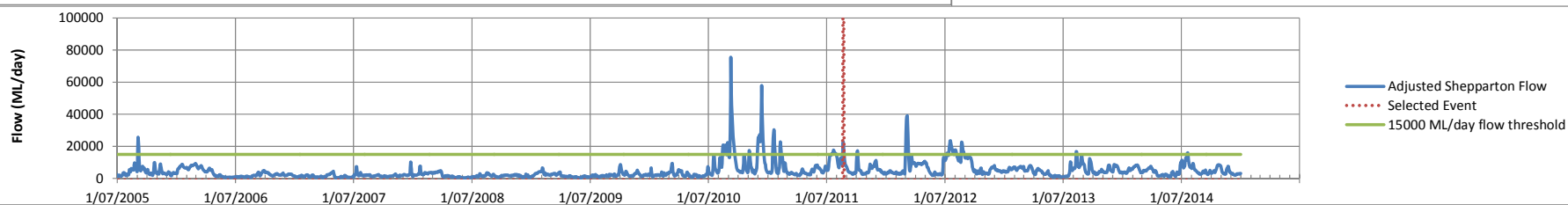
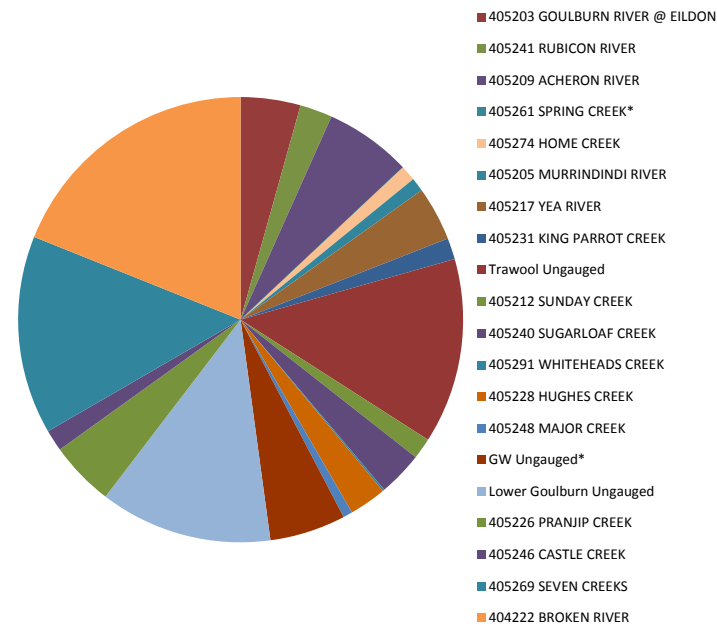
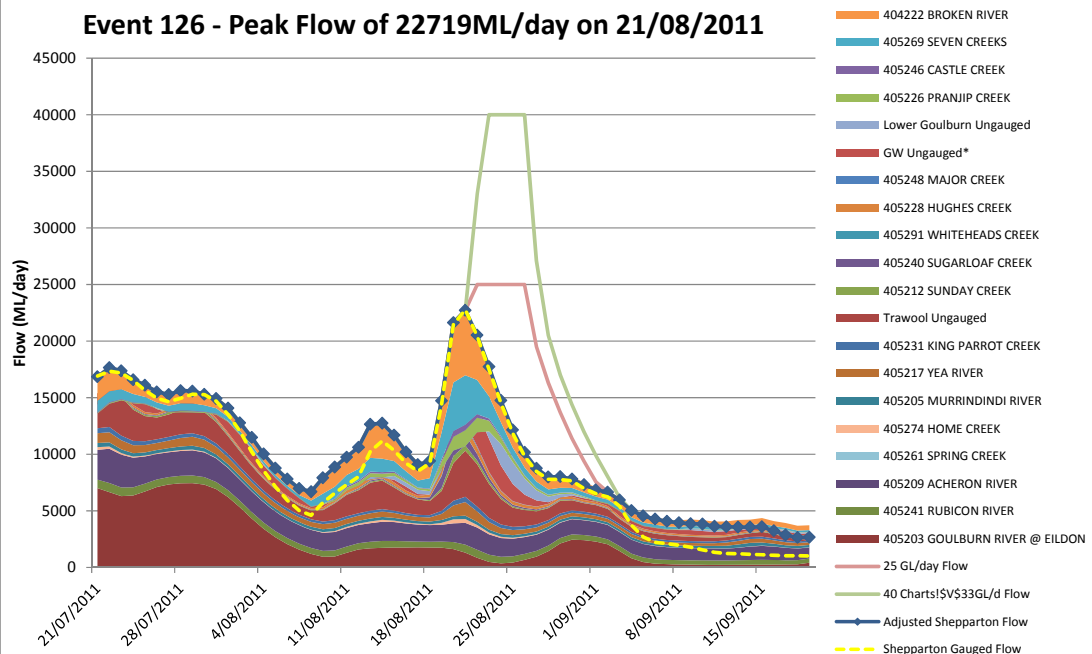
Event 124 - Peak Flow of 22770ML/day on 08/02/2011



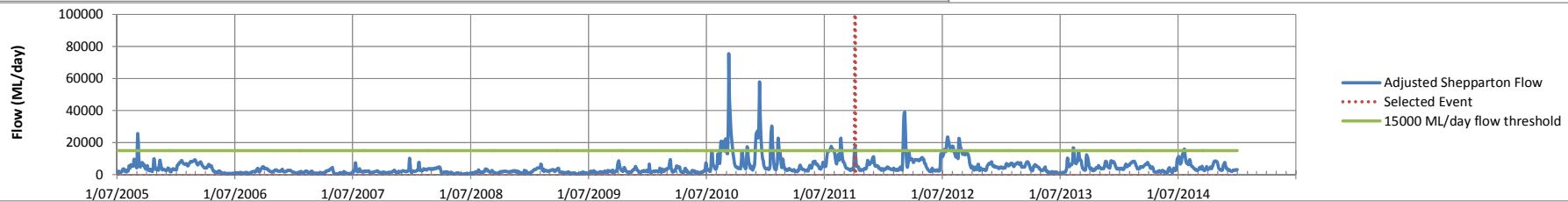
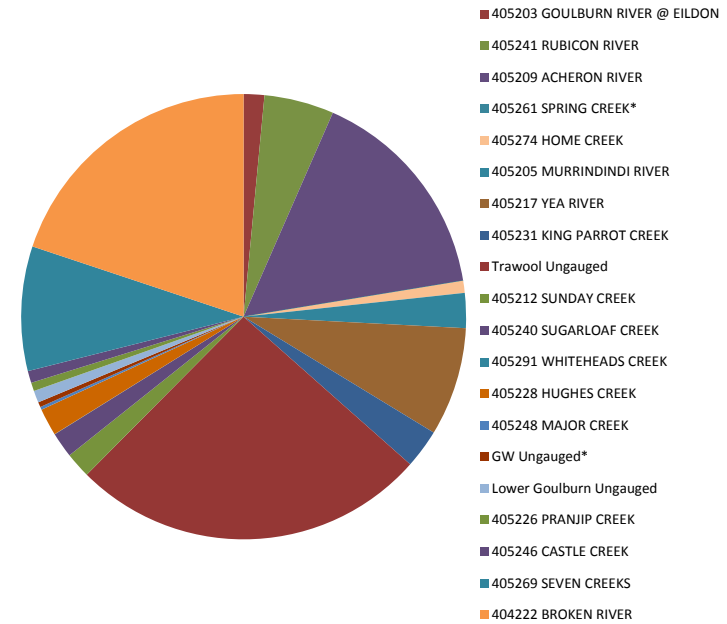
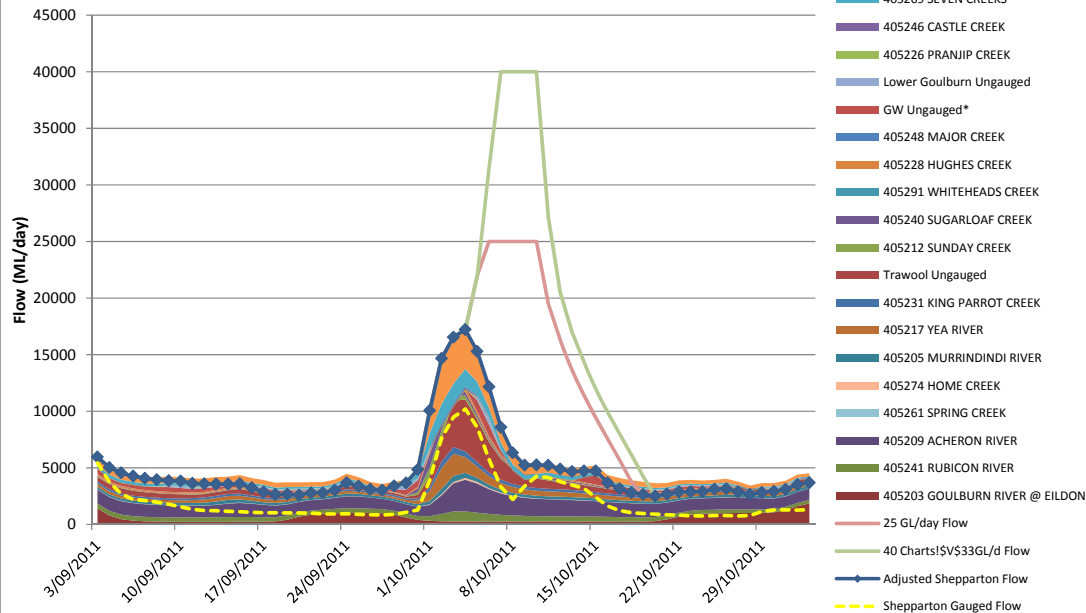
Event 125 - Peak Flow of 17653ML/day on 22/07/2011



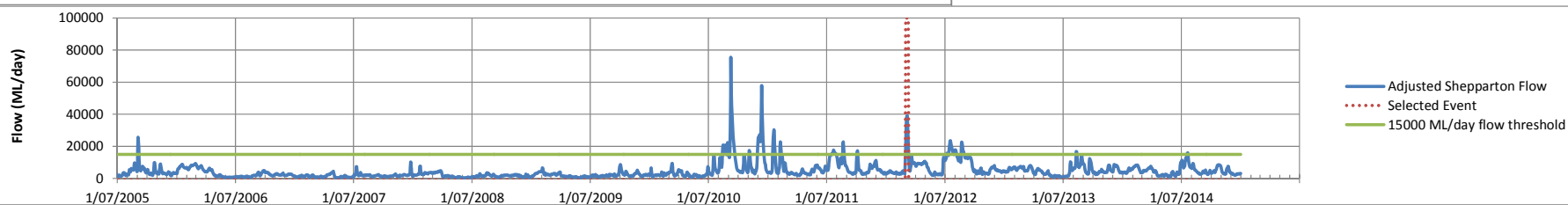
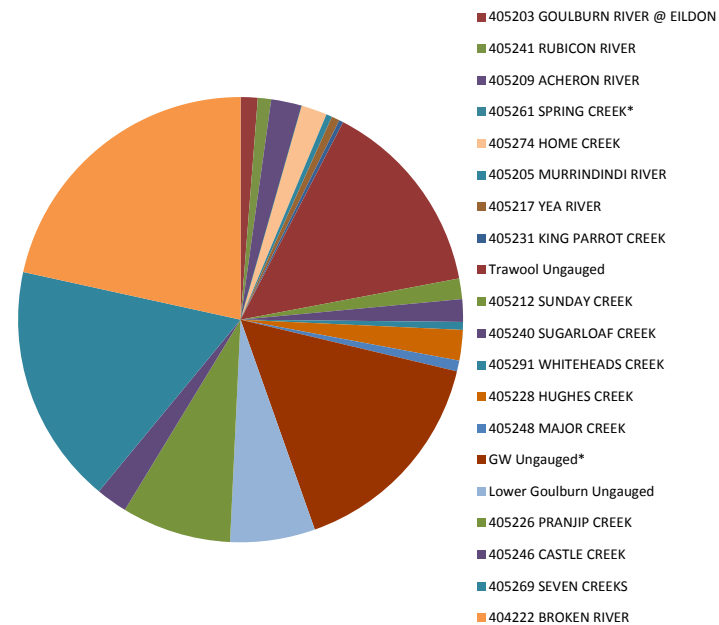
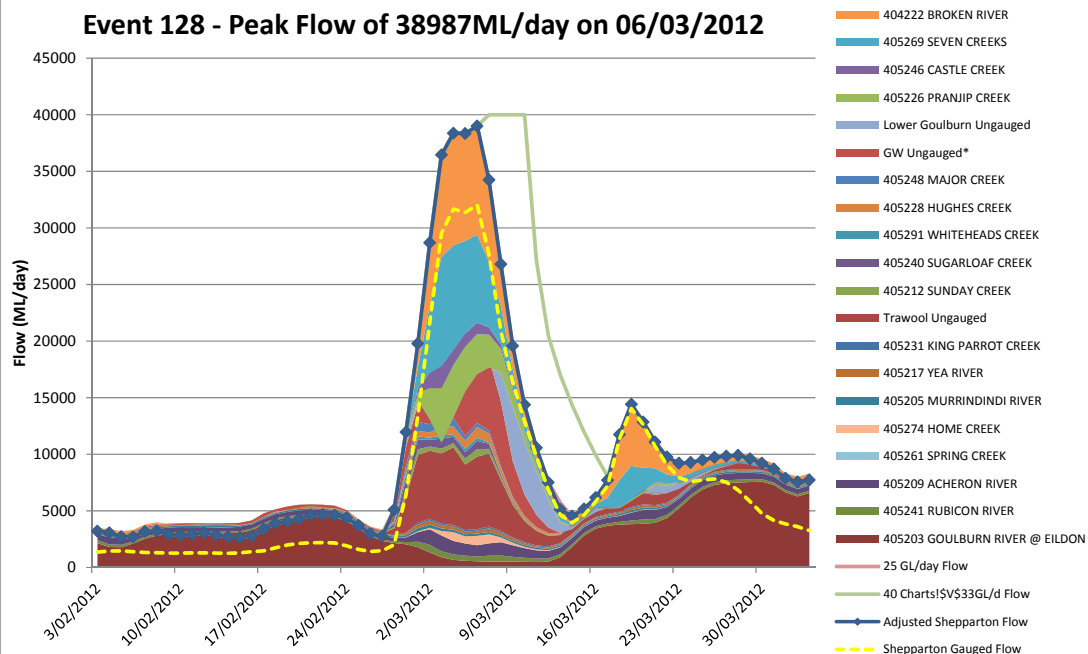
Event 126 - Peak Flow of 22719ML/day on 21/08/2011



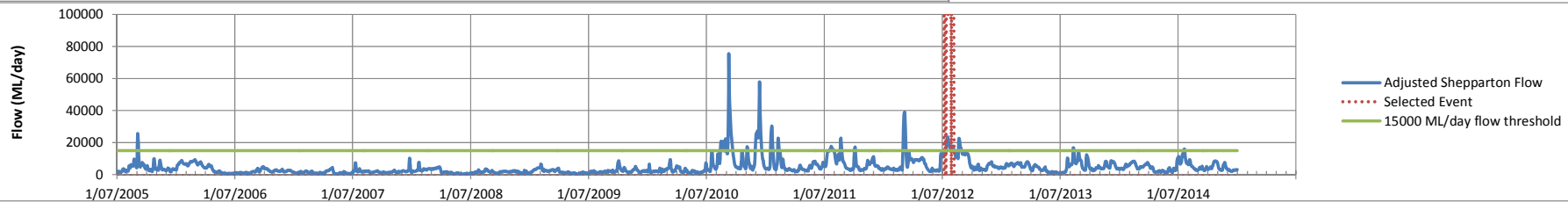
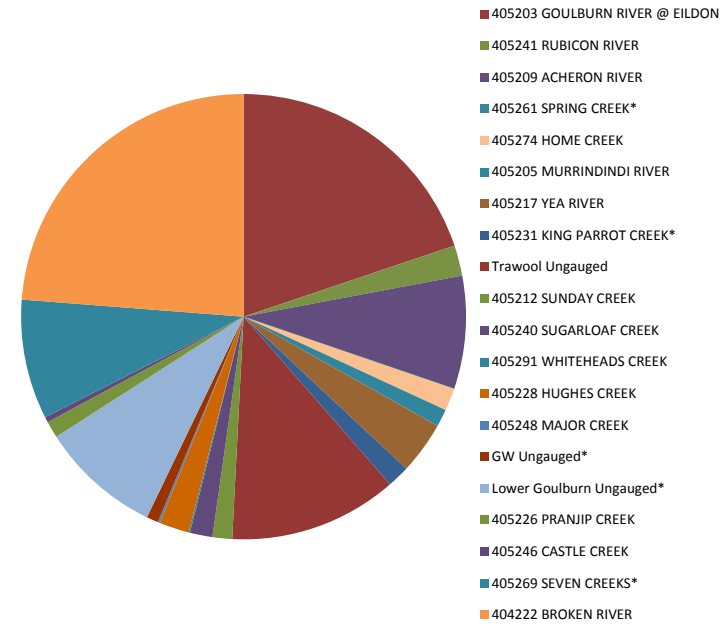
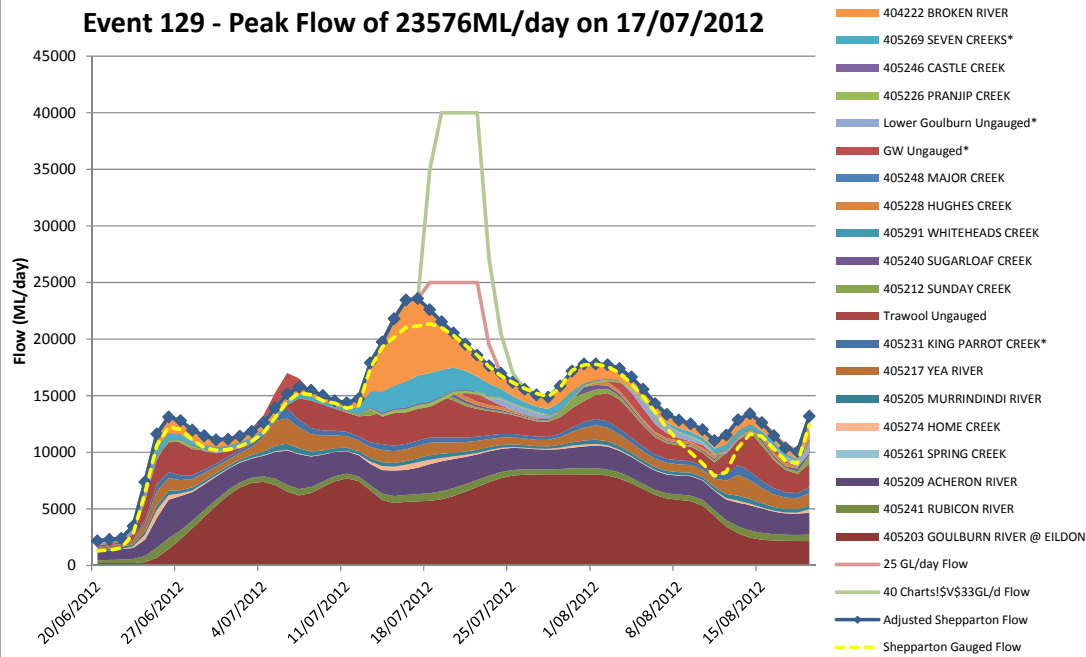
Event 127 - Peak Flow of 17218ML/day on 04/10/2011

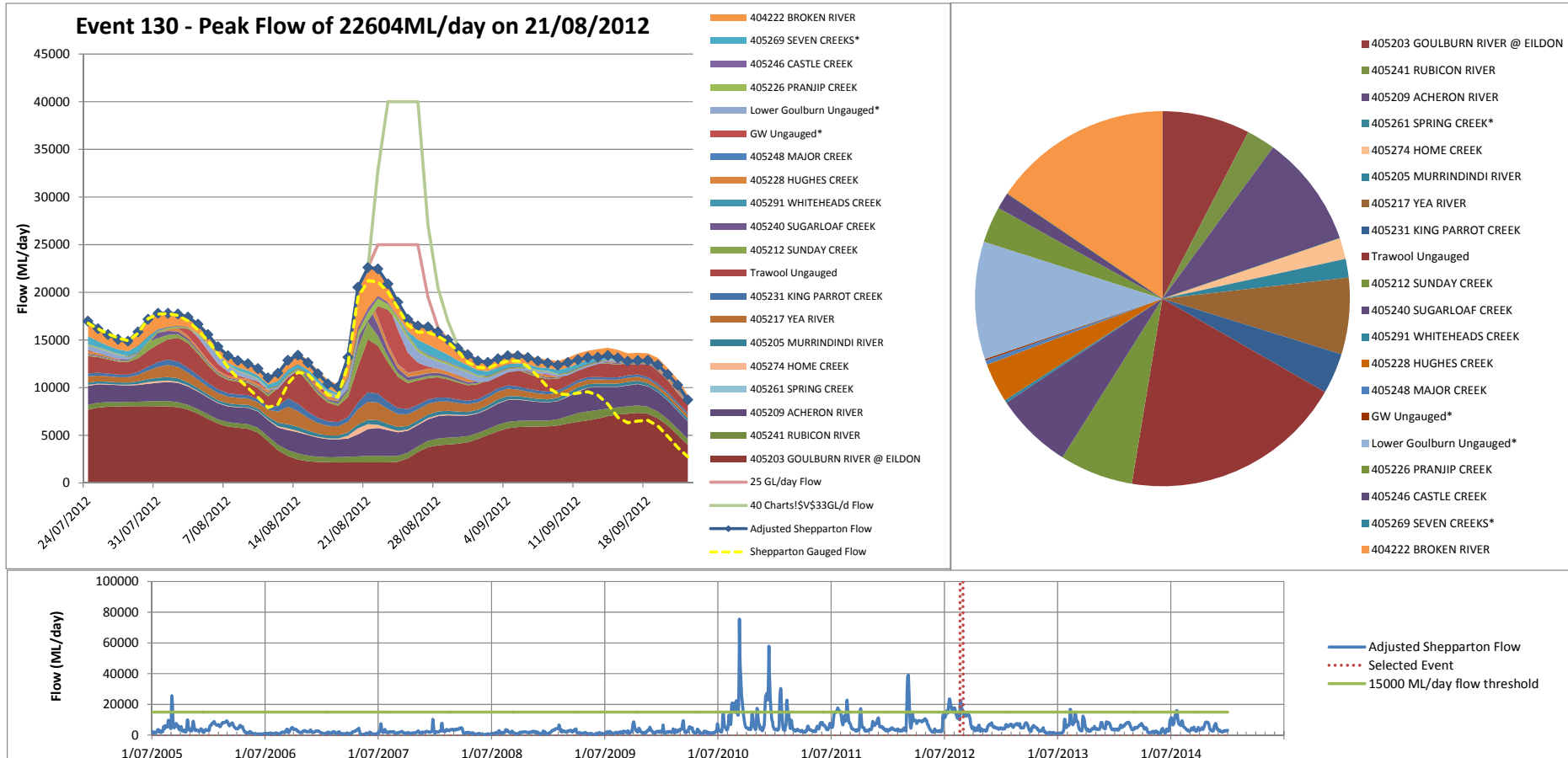


Event 128 - Peak Flow of 38987ML/day on 06/03/2012

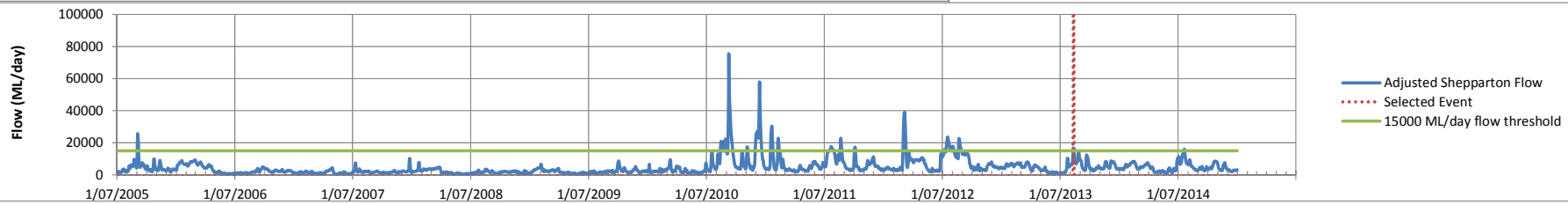
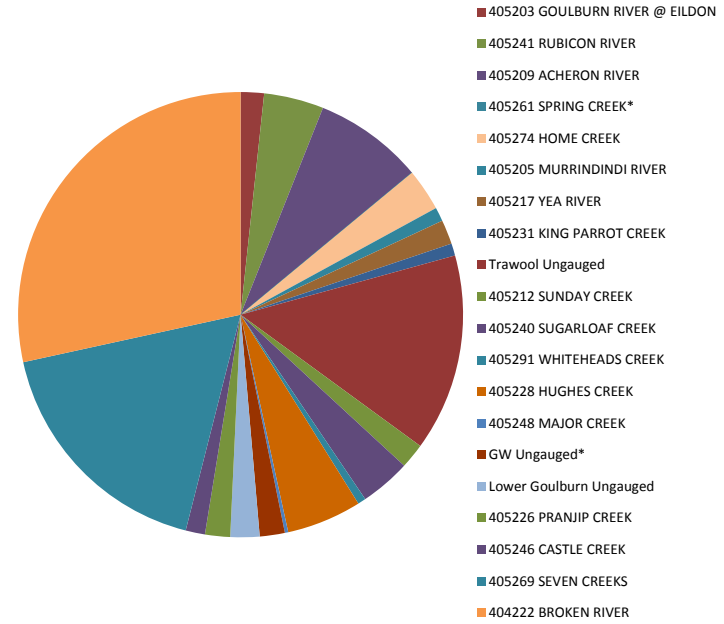
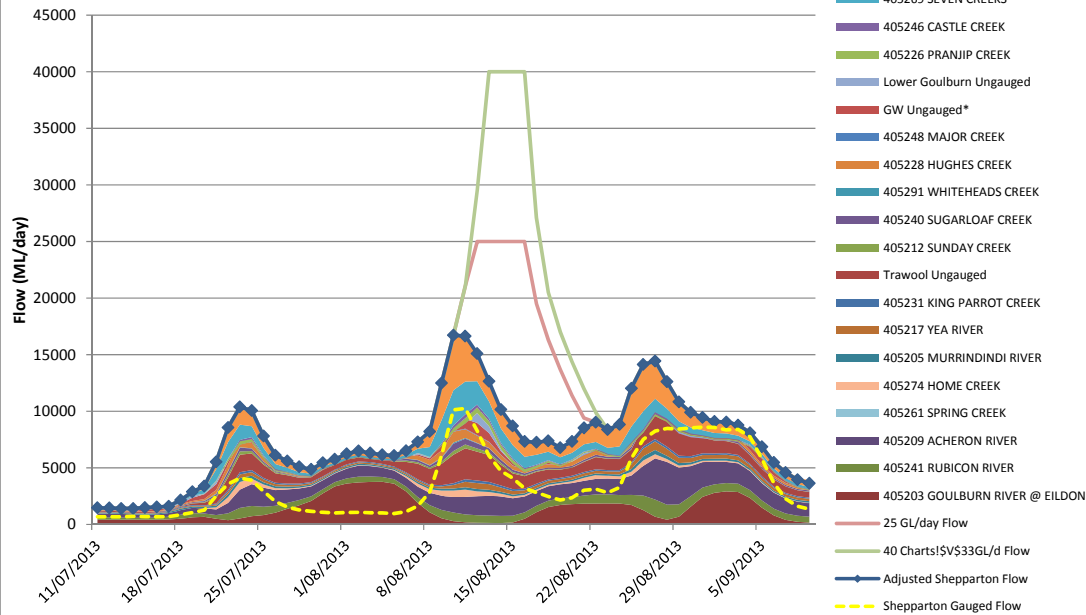


Event 129 - Peak Flow of 23576ML/day on 17/07/2012

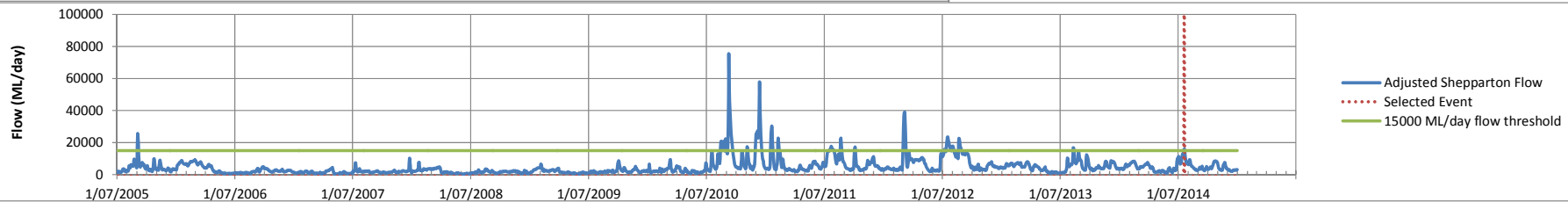
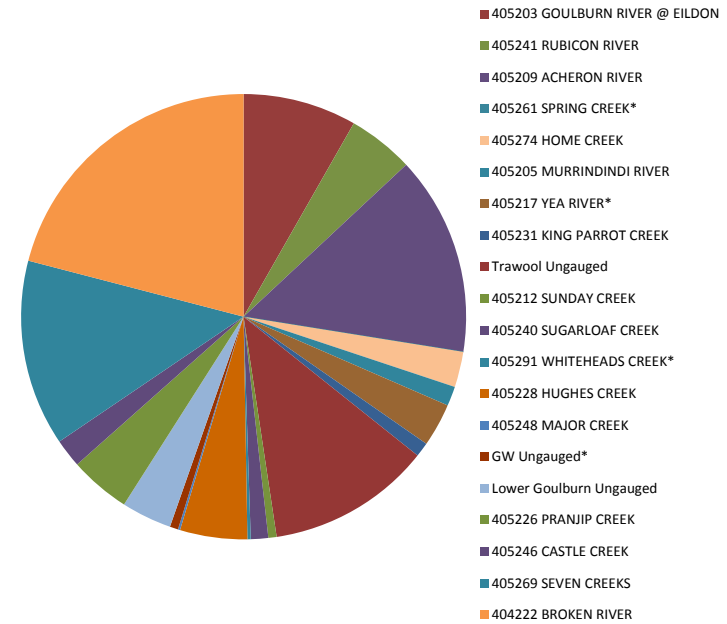
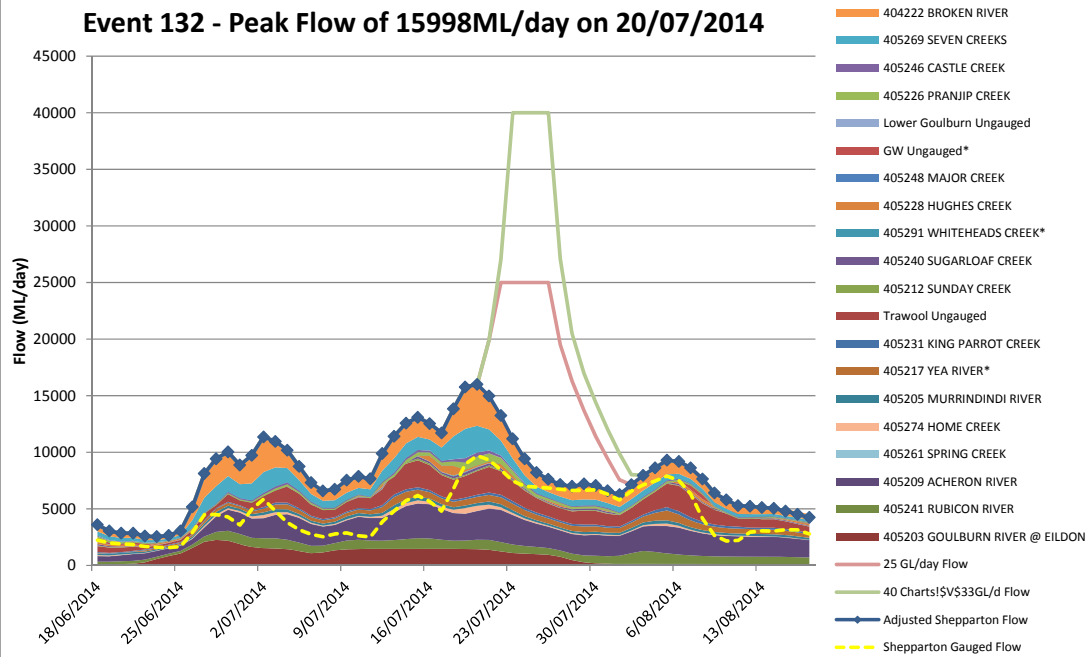




Event 131 - Peak Flow of 16719ML/day on 10/08/2013



Event 132 - Peak Flow of 15998ML/day on 20/07/2014



Appendix B. Broken River Flow Analysis

The flow records for the Broken River at Moorngag, Moonee Creek at Lima and Holland Creek at Kelfeera were examined in the period prior to the construction of Lake Nillahcootie in (1968) and Lake Mokoan (1971). It was found that the travel time is approximately a day for all of the three locations to Casey's Weir.

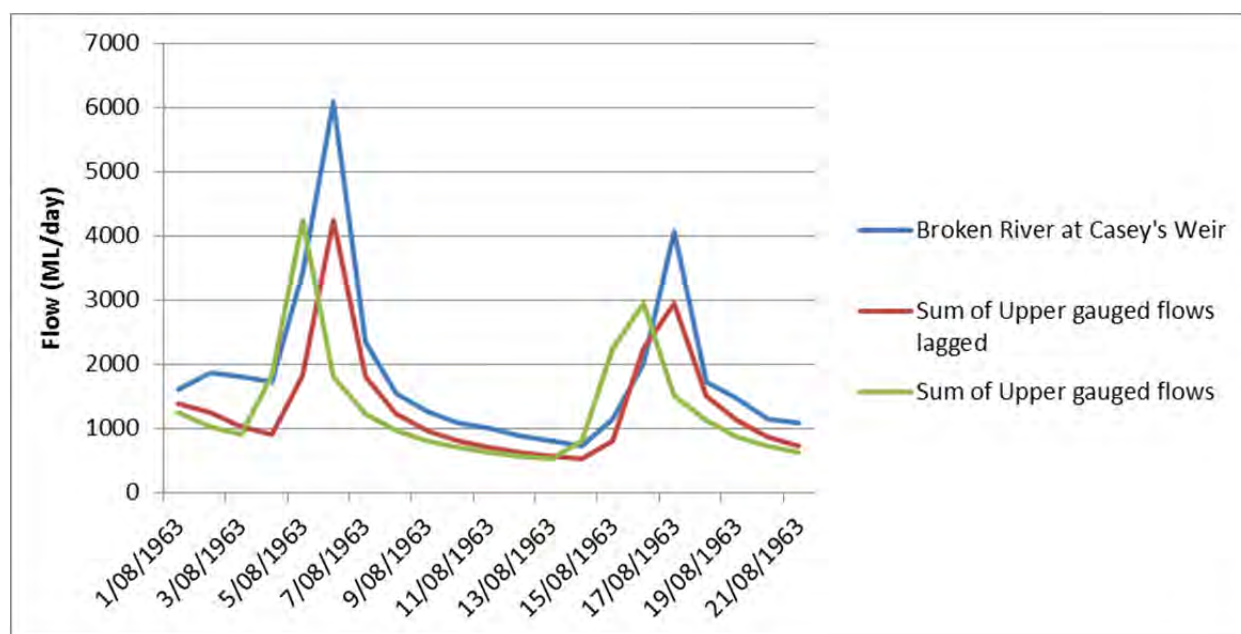


Figure B.1 : Broken River flow August 1963

The annual flow data between 1964 and 1969 inclusive shows that the sum of Broken River at Moorngag, Moonee Creek and Holland Creek accounts for between 70 – 82% of the outflow at Casey's Weir. The Mean Annual Flow in the Broken River at Moorngag is similar to Holland Creek. Moonee Creek is far lower as presented in Table B.1.

Table B.1 : Broken Catchment Mean Annual Flow 1964 - 1969

Site	Mean Annual Flow (GL/year)
Moonee Creek at Lima	18
Broken River at Moorngag	72
Holland Creek at Kelfeera	83

A daily flow regression between the sum of Broken River at Moorngag, Moonee Creek and Holland Creek lagged by one day against the Broken River at Casey's Weir over the period from June 1963 to November 1963, showed that the sum of the three upper Broken catchment gauged flows contributed 71% of the flow to the Broken River at Casey's Weir.

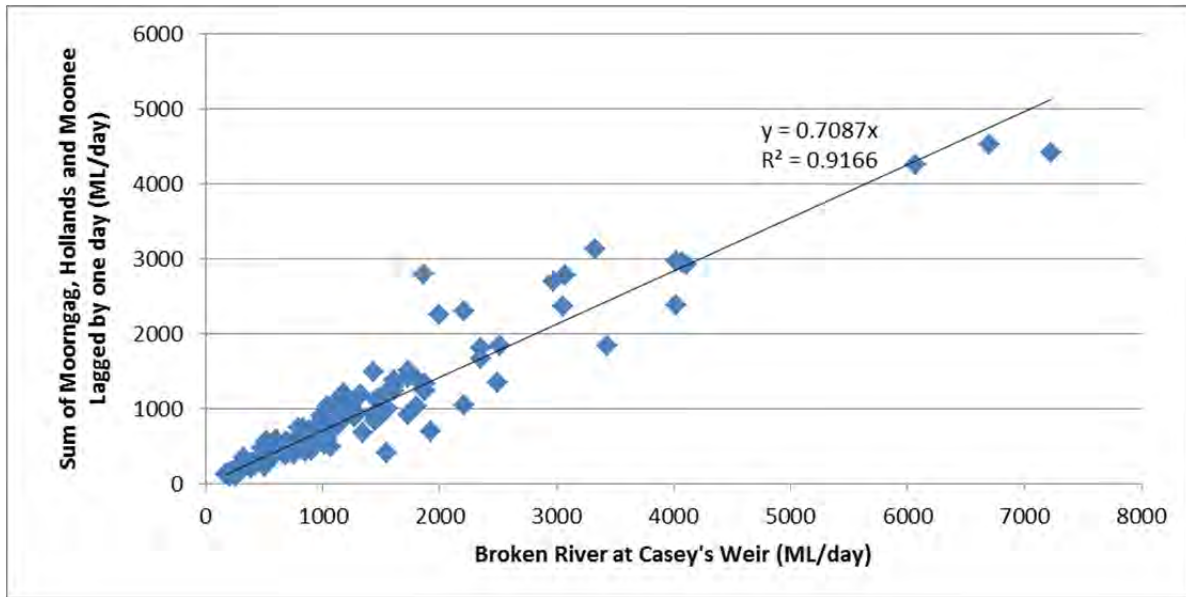


Figure B.2 : Broken River flow at Caseys Weir compared to the sum of upstream gauged flows

Therefore a trigger was trialled of the sum of these three gauged flows which provides an additional day's travel time from Shepparton than Casey's Weir and two days additional travel time from Orrvale.

Analysis of a more recent event in July 2011 showed that nearly all of the peak flow at Orrvale had originated from the three gauged upper Broken tributaries. This is shown in Figure B.3.

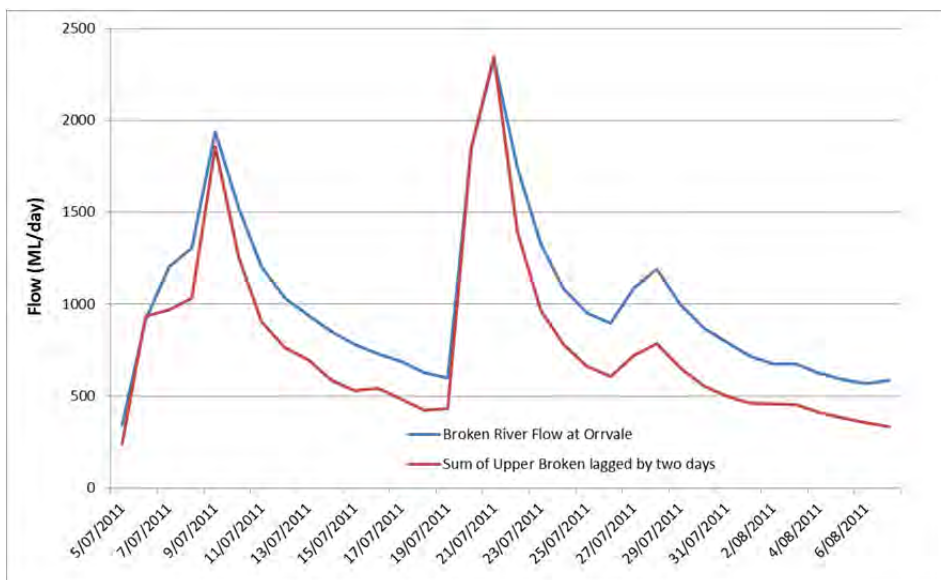


Figure B.3 : Broken River flow at Orrvale compared to the sum of upstream gauged flows