

Flood Estimation Report



Project name: Flood estimation example 2

Project number: 2026-00A

Client: SANRAL

Designer: Marco van Dijk

Date analysed: 2026-09-16 14:11:15

Project notes: Example project of a statistical analysis of historical flood data

Included sections

1. Flood Frequency Analysis

DISCLAIMER

This software has been developed as a tool to assist users and is provided for convenience only. While every reasonable effort has been made to ensure the accuracy and reliability of the calculations and outputs, Green Hippo Innovations makes no warranties, express or implied, regarding the results produced. Users are responsible for independently verifying all results and interpretations. Green Hippo Innovations accepts no liability for any loss, damage, or consequences arising from the use of this software or reliance on its outputs. Use of this software is entirely at the user's own risk.

Flood frequency analysis



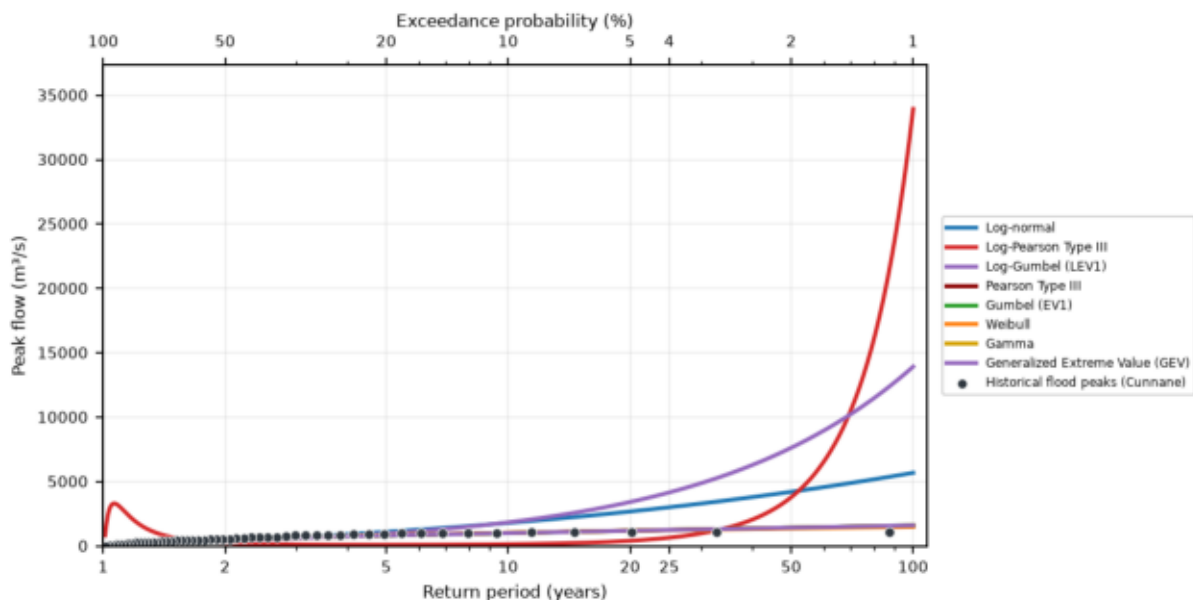
ANALYSIS SETTINGS AND SUMMARY

Station	T3H006 - Tsitsa River @ Xonkonxa
Input file	T3H006_Primary_data.txt Data type: HD
Series	Annual maximum series
Plotting position	Cunnane (A=0.4, B=0.2)
Log transformation	applied automatically for log-distributions
Flood peak values extracted	52
Maximum flood peak	1049 m ³ /s
Maximum peak date	2013-04-21 (2012/13)
Annual maximum values	52
Mean (Qave)	583.512 m ³ /s
Standard deviation (SD)	322.714 m ³ /s
SD excluding maximum (SD*)	319.083 m ³ /s

FITTED DESIGN FLOWS

Distribution	1:2 yr	1:5 yr	1:10 yr	1:20 yr	1:25 yr	1:50 yr	1:100 yr	1:200 yr	1:500 yr
	(m ³ /s)	(m ³ /s)	(m ³ /s)	(m ³ /s)	(m ³ /s)	(m ³ /s)	(m ³ /s)	(m ³ /s)	(m ³ /s)
Log-normal	434	1100	1790	2675	3007	4204	5683	7489	10462
Log-Pearson Type III	246	89	135	403	644	3791	33935	438469	21269948
Log-Gumbel (LEV1)	362	961	1836	3415	4158	7626	13925	25368	55972
Pearson Type III	526	822	1014	1193	1249	1419	1584	1746	1956
Gumbel (EV1)	530	816	1005	1186	1243	1420	1596	1771	2002
Weibull	541	847	1024	1178	1224	1358	1481	1596	1737
Gamma	526	822	1014	1193	1249	1419	1584	1746	1956
Generalized Extreme Value	530	816	1005	1186	1243	1420	1596	1771	2002

FLOOD FREQUENCY DISTRIBUTION GRAPH



Flood frequency analysis



FLOOD PEAK SERIES

Hydrological year	Peak date	Peak flow (m ³ /s)
1970/71	1970-10-12	659.8
1971/72	1972-02-25	1016.4
1972/73	1973-02-19	220.0
1974/75	1975-03-12	290.1
1975/76	1976-03-21	1016.4
1976/77	1976-10-05	1016.4
1977/78	1978-04-22	935.2
1979/80	1980-03-02	83.8
1982/83	1983-09-25	1.1
1983/84	1984-03-07	258.0
1984/85	1985-02-09	839.6
1985/86	1985-12-06	391.7
1986/87	1987-09-29	291.7
1987/88	1988-03-03	878.2
1988/89	1989-02-18	907.6
1989/90	1989-11-29	621.7
1990/91	1991-02-20	79.6
1991/92	1992-01-09	263.9
1992/93	1993-02-12	93.9
1993/94	1994-02-07	516.6
1994/95	1995-01-15	238.4
1995/96	1996-01-26	1016.4
1996/97	1997-06-12	430.7
1997/98	1998-03-01	665.1
1998/99	1999-01-29	752.1
1999/00	2000-03-16	844.0
2000/01	2001-02-14	361.0
2001/02	2002-09-10	889.1
2002/03	2003-01-11	94.1
2003/04	2004-09-26	443.5
2004/05	2005-01-23	500.6
2005/06	2006-09-27	813.2
2006/07	2006-11-27	450.4
2007/08	2008-02-24	675.9
2008/09	2009-02-15	855.4
2009/10	2010-02-26	281.9
2010/11	2011-01-06	515.6
2011/12	2012-01-13	448.5
2012/13	2013-04-21	1048.7
2013/14	2014-01-10	529.5
2014/15	2015-01-16	421.4
2015/16	2016-03-13	130.1
2016/17	2017-02-19	292.3
2017/18	2017-10-10	588.2
2018/19	2019-04-23	978.7
2019/20	2020-03-02	451.0
2020/21	2021-01-28	657.2
2021/22	2022-04-12	1048.7
2022/23	2023-02-10	1048.7
2023/24	2024-01-11	1048.7

FLOOD PEAK SERIES — CONTINUED

Hydrological year	Peak date	Peak flow
		(m³/s)
2024/25	2025-06-10	1048.7
2025/26	2026-02-14	393.0

Flood frequency analysis



FITTED DESIGN FLOWS

Distribution / limit	1:2 yr	1:5 yr	1:10 yr	1:20 yr	1:25 yr	1:50 yr	1:100 yr	1:200 yr	1:500 yr
	(m³/s)	(m³/s)	(m³/s)	(m³/s)	(m³/s)	(m³/s)	(m³/s)	(m³/s)	(m³/s)
Log-normal	434	1100	1790	2675	3007	4204	5683	7489	10462
lower CL	337	799	1221	1729	1912	2553	3308	4190	5579
upper CL	558	1515	2625	4139	4728	6924	9766	13384	19621
Log-Pearson Type III	246	89	135	403	644	3791	33935	438469	21269948
lower CL	191	64	92	260	410	2302	19749	245344	11341401
upper CL	316	122	198	623	1013	6243	58309	783615	39890194
Log-Gumbel (LEV1)	362	961	1836	3415	4158	7626	13925	25368	55972
lower CL	281	698	1252	2207	2645	4631	8104	14195	29845
upper CL	466	1324	2692	5285	6538	12560	23926	45337	104971
Pearson Type III	526	822	1014	1193	1249	1419	1584	1746	1956
lower CL	452	729	902	1066	1117	1273	1426	1576	1773
upper CL	600	916	1126	1321	1381	1564	1742	1915	2140
Gumbel (EV1)	530	816	1005	1186	1243	1420	1596	1771	2002
lower CL	457	722	893	1058	1111	1274	1438	1601	1818
upper CL	604	909	1116	1313	1375	1566	1754	1940	2185
Weibull	541	847	1024	1178	1224	1358	1481	1596	1737
lower CL	467	753	913	1051	1092	1212	1323	1426	1554
upper CL	615	940	1136	1306	1356	1504	1639	1765	1921
Gamma	526	822	1014	1193	1249	1419	1584	1746	1956
lower CL	452	729	902	1066	1117	1273	1426	1576	1773
upper CL	600	916	1126	1321	1381	1564	1742	1915	2140
Generalized Extreme Value (GEV)	530	816	1005	1186	1243	1420	1596	1771	2002
lower CL	457	722	893	1058	1111	1274	1438	1601	1818
upper CL	604	909	1116	1313	1375	1566	1754	1940	2185

Confidence limits used: lower 0.05; upper 0.95.

Flood Frequency Analysis

Flood estimation example 2

GHI HydroSuite V 1.1

www.greenhippo.co.za

