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Assessment of source regions of the Zambezi River: implications for regional water security

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Supplement

Figure S1. Source of the Lungwebungu, the most distant tributary to the Zambezi Basin, starts as a small trickle pouring out of a bowl-shaped peatland bog supported by groundwater.

Figure S2. The traditional source of the Zambezi River originates from a small spring, near Kalene Hill in Zambia.

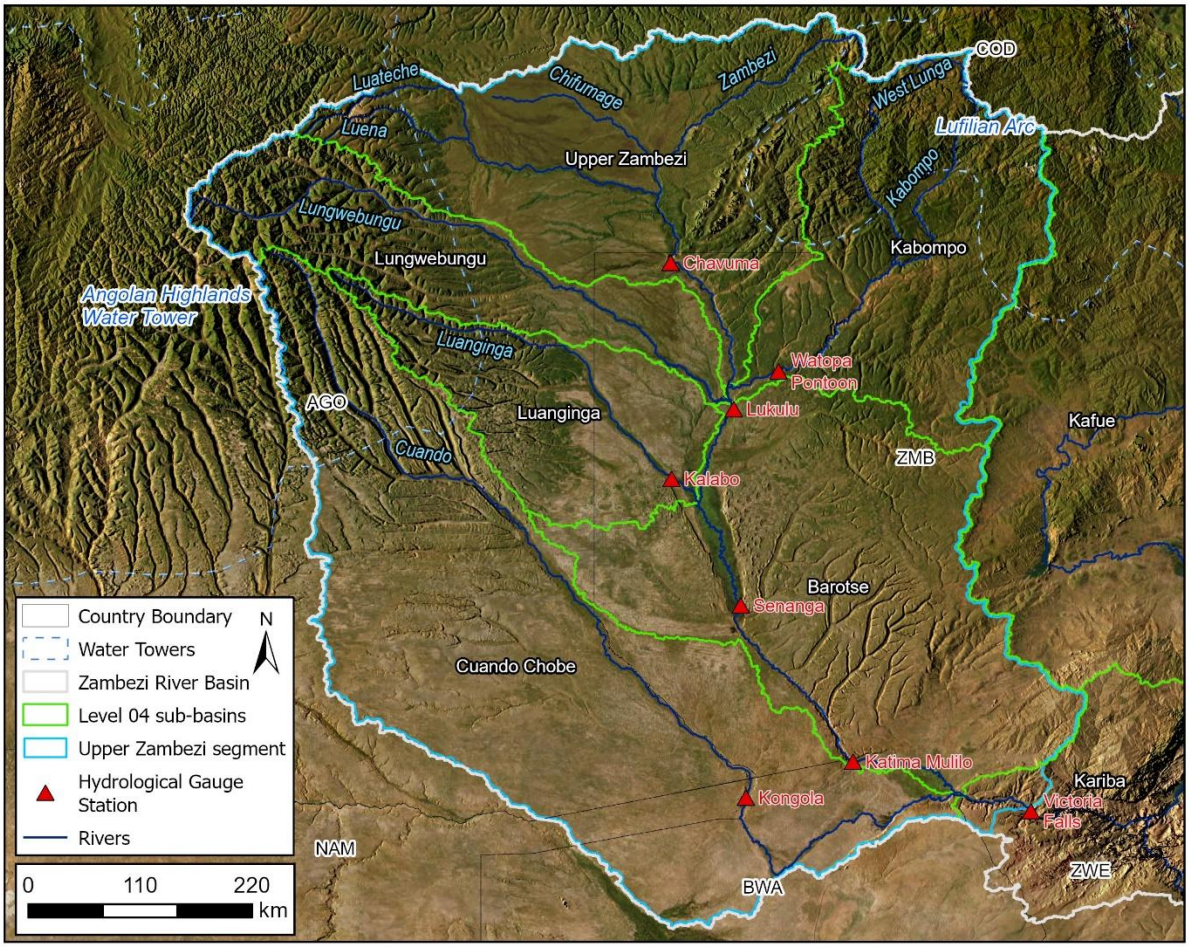

Figure S3. The locations of each hydrological gauge station (red triangles) used in comparison with the Collins et al. (2024) and Akpoti et al. (2024) datasets within the Upper Zambezi Segment.

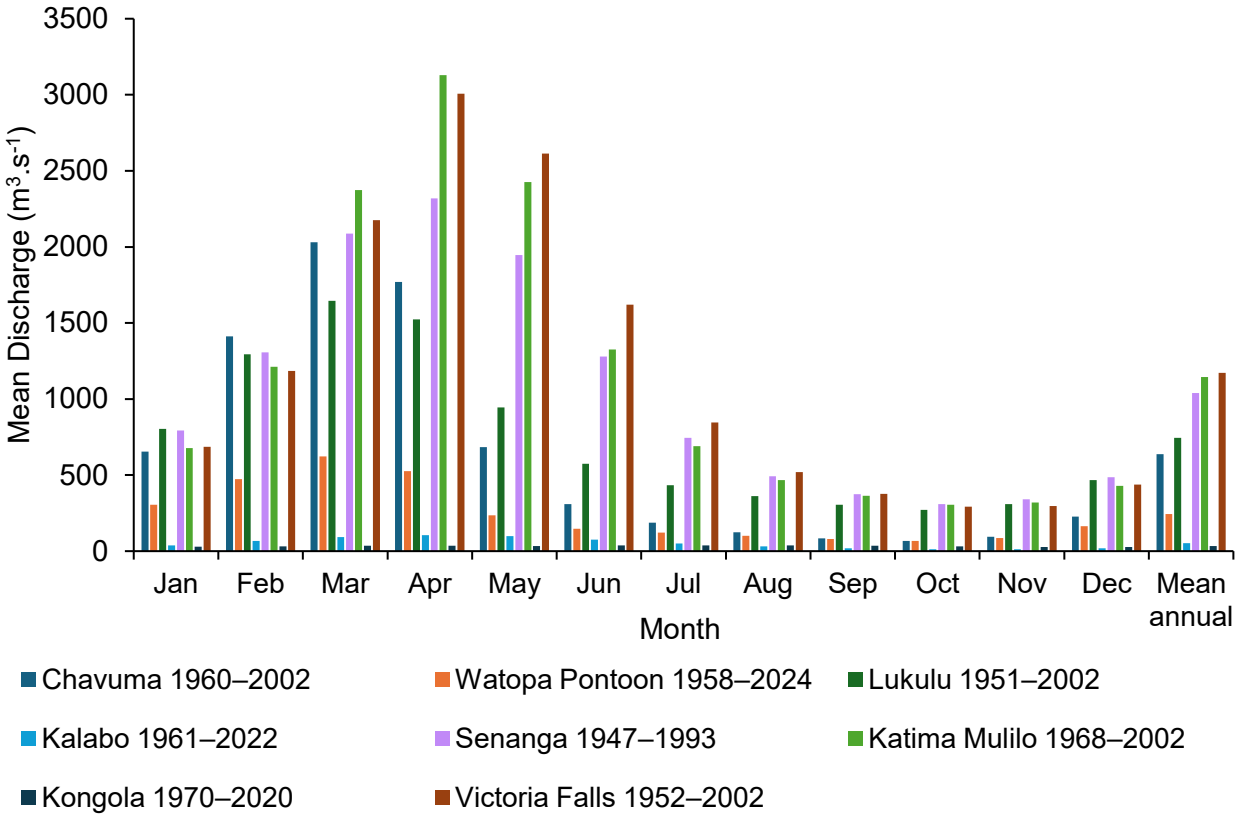

Figure S4. The mean monthly discharge over separate time series for each of the eight hydrological gauge stations.

Table S1. ADCP discharge measurements within the Upper Zambezi segment, listed in chronological order of sampling

Site No.	Site description and river names	Q ($m^3.s^{-1}$)	Date
1	Measured along Lungwebungu River	8.2	2022/06/07
2	Measured along Lungwebungu River	13.1	2022/06/10
3	Measured along Lungwebungu River	21.5	2022/06/11
4	Measured along Lungwebungu River	36.8	2022/06/16
5	Measured along Lungwebungu River	55.6	2022/06/19
6	Measured along Lungwebungu River	81.1	2022/06/23
7	Measured along Lungwebungu River	86.8	2022/06/26
8	Measured along Lungwebungu River	90.5	2022/07/01
9	Measured along Lungwebungu River	104.9	2022/07/04
10	Measured along Luanginga River	14.1	2022/07/05
11	Measured along Lungwebungu River	201.4	2023/03/04
12	Measured along Lungwebungu River	213.1	2023/03/07
13	Measured along Lungwebungu River	257.8	2023/03/07
14	Measured along Lungwebungu River	288.3	2023/03/08
15	**Measured at end of Kashiji River confluence with Lungwebungu**	**75.6**	**2023/03/10**
16	**Measured at end of Lungwebungu confluence with Zambezi**	**335.7**	**2023/03/10**
17	Measured along Zambezi River downstream of Lungwebungu	1471.1	2023/03/10
18	Measured along Cuando River	29.1	2023/03/29
19	Measured along Cuando River	24.6	2023/04/06
20	Measured along Cuando River	23.9	2023/04/06
21	Measured along Zambezi River	1.6	2023/05/05
22	Measured along Zambezi River	6.7	2023/05/06
23	Measured along Zambezi River	16.0	2023/05/10
24	Measured along Zambezi River	923.4	2023/05/17
25	Measured along Zambezi River	928.6	2023/05/17
26	**Measured at end of Kabompo, confluence with Zambezi**	**318.1**	**2023/05/21**
27	**Measured at end of Lungwebungu, confluence with Zambezi**	**193.8**	**2023/05/22**
28	Measured along Zambezi River upstream of LB confluence	1194.2	2023/05/22
29	Measured along Zambezi River upstream of Ngoye Falls	2323.1	2023/05/31
30	**Measured at end of Jimbe, confluence with Zambezi**	**3.6**	**2023/07/07**
31	Measured along Zambezi River	18.0	2023/07/08
32	Measured along Zambezi River	26.8	2023/07/10
33	Measured along Zambezi River	28.5	2023/07/13
34	**Measured at the end of smaller Luateche tributary with Zambezi**	**5.2**	**2023/07/14**
35	**Measured at the end of Luisaba River, confluence with Zambezi**	**37.7**	**2023/07/16**
36	Measured along Zambezi River	106.0	2023/07/18
37	**Measured at the end of Luvua River, confluence with Zambezi**	**5.5**	**2023/07/19**
38	**Measured at end of Chifumage, confluence with Zambezi**	**21.2**	**2023/07/21**
39	**Measured at end of Luena, confluence with Zambezi**	**72.5**	**2023/07/22**
40	Measured along Zambezi River	135.4	2023/07/22
41	**Measured at end of Longonho River, confluence with Zambezi**	**1.1**	**2023/07/22**

42	**Measured at end of Lumbala River, confluence with Zambezi**	**3.9**	**2023/07/23**
43	**Measured at end of Lufuige River, confluence with Zambezi**	**5.6**	**2023/07/23**
44	Measured along Zambezi River	212.8	2023/07/24
45	Measured along Zambezi River	579.6	2023/07/30
46	**Measured at end of Lumbe River, confluence with Zambezi**	**5.7**	**2023/08/01**
47	Measured along Zambezi River	567.2	2023/08/06

Supplement Table S1 notes: confluence measurements in bold.

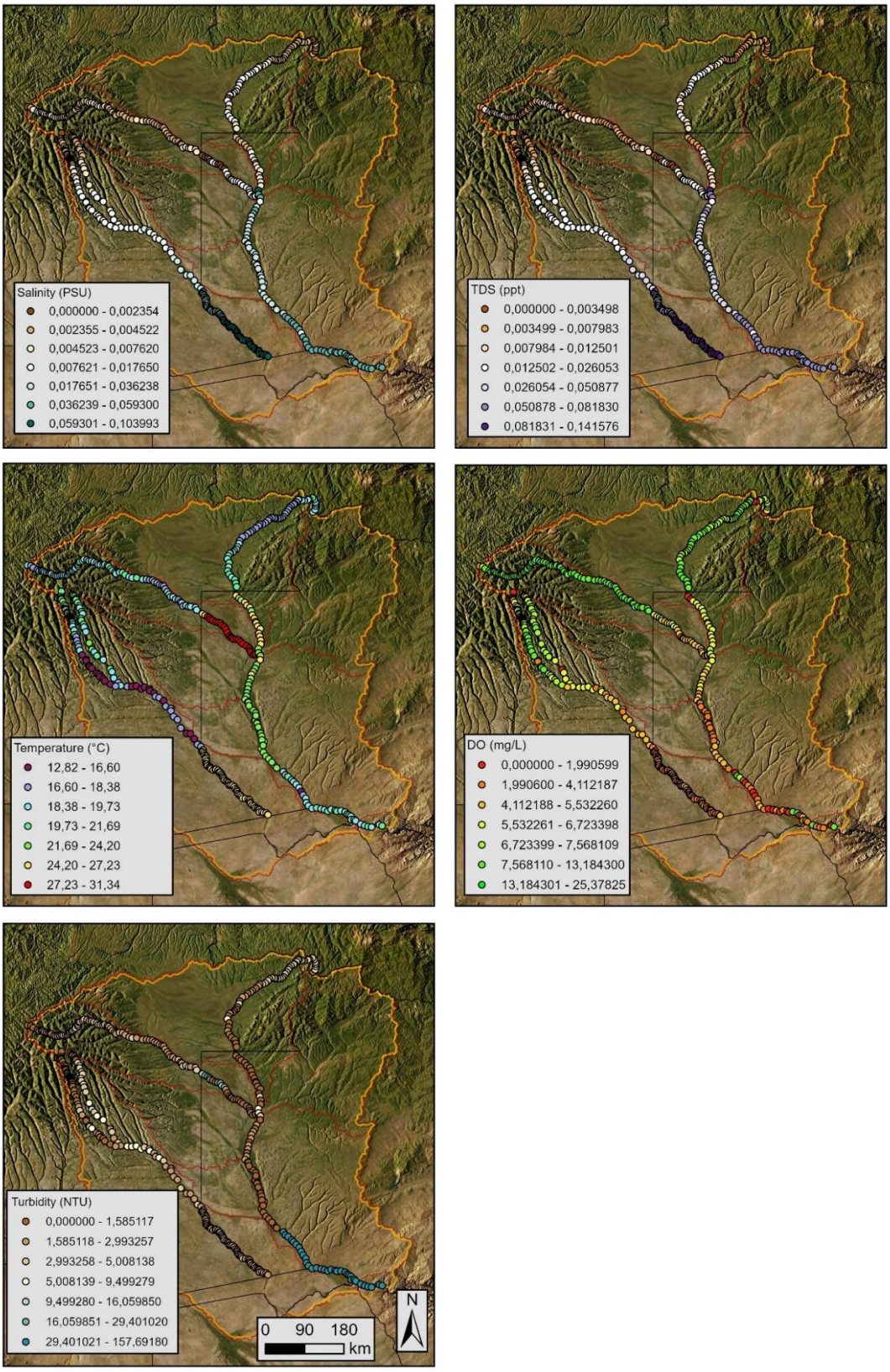

Figure S5. TWP river expedition water quality parameters including salinity, total dissolved solids (TDS), temperature, dissolved oxygen (DO), and turbidity for the Upper Zambezi Segment.

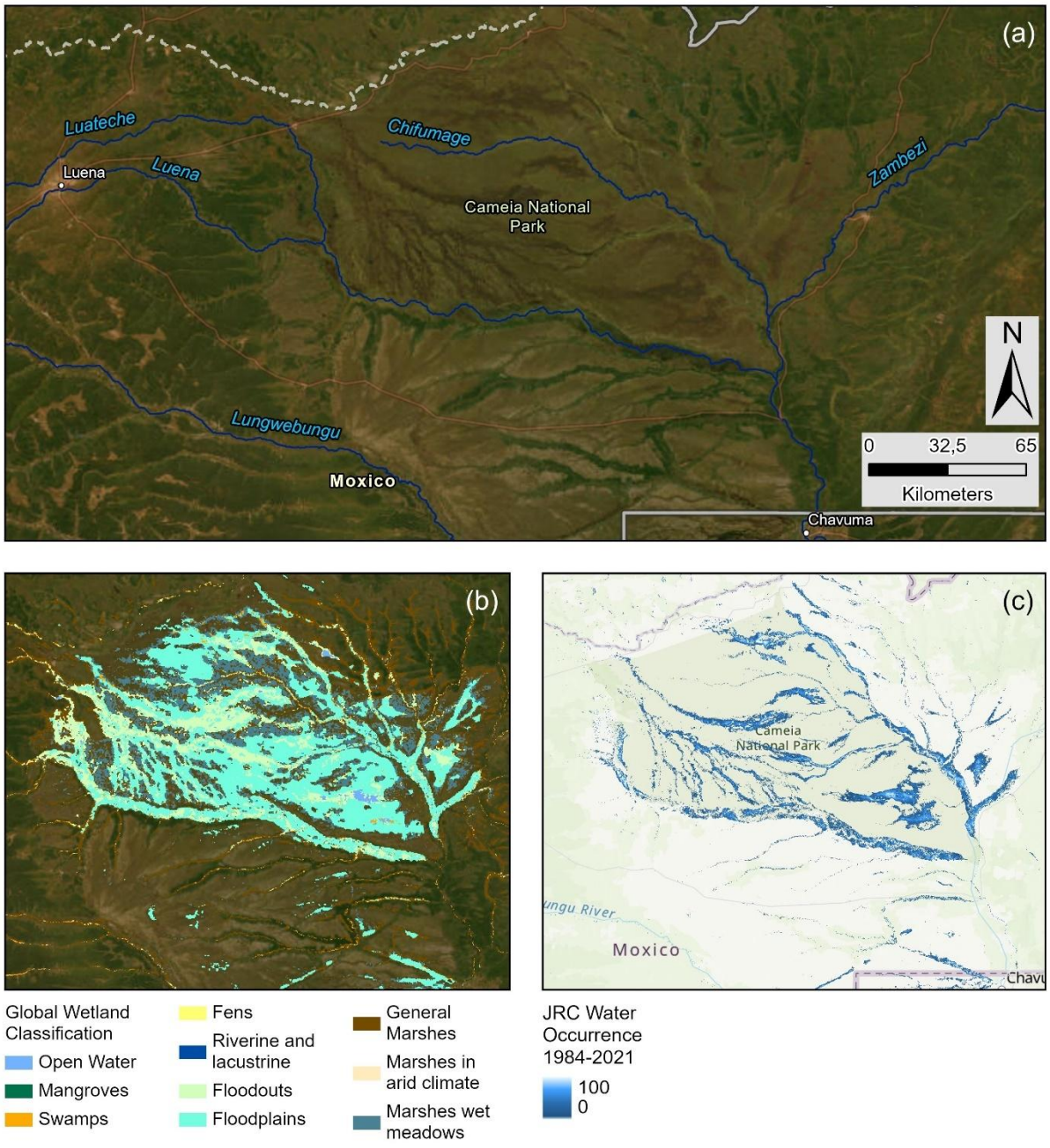

Figure S6. (a) Satellite view of the Kameia floodplain region including major rivers of the Upper Zambezi segment, Moxico Province, Angola (source: ESRI World Imagery), (b) CIFOR wetland classification, and (c) JRC water occurrence 1984–2021.