Surface Water

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1. General background

The stream flows in Israel are divided to Western and Eastern drainage areas (see figure 1). The Western stream flows are drainage into the Mediterranean Sea while the Eastern stream flows are drainage to the Lake of Galilee, the Dead Sea and the Red Sea. The Israeli Hydrological Service is operation over 100 hydrometric stations all over Israel. The stations are measuring water levels and using a rating curve (based on direct discharge measurements) for each station the water level is it being translated into discharge and water volumes.



Figure 1: The Western and Eastern drainage area in Israel

2. Annual flood volumes in Israel

The surface stream flow volumes are divided to "Full flow" and "Flood flow". Full flow volumes are defined as all the flow that is measured in the gauges. It includes base flow from spring, water coming from flood events and sewage that is drainage into the streams. Flood volumes are just the water volumes that come from floods events during the rainy season.

Over 90% of the annual flood flow volumes in Israel are drainage to the Mediterranean Sea (the precipitation amount at the Eastern region downstream from the Kinneret are low. This area is arid due to the fact that it located on the lee side of the Judea and Samaria hills. The Kinneret basin was excluded from this chapter and it being presented in a separate paragraph).

The area covered by hydrometric stations in the western drainage area is around 9,000 km^2. This area is just 87% out of the total Western drainage area so the flow volumes for the rest 13% (mostly urban area) are not measured and where evaluated according to rainfall / runoff coefficients.

Table 1 presents the annual measured flood stream flow and the runoff / precipitation ratio at the Western drainage area from 1985 to 2009. Those volumes do not include the water volumes from the 13% not measured area. The flood coming from this area is evaluated to be around 40 mcm.

Table 2 present the averages and medians flood volumes at the total Western drainage area (87% measured and 13% evaluated) for the periods 1985-2009, 1993-2009. It can be seen in the table that the average flood volumes in the Western drainage area is between 180 to 210 mcm,

depend in the time period. Additional 25 mcm coming from the Eastern drainage area should be added to this volume in order to get the total flood volumes in the country.

Table 1: Annual measured flood volumes and runoff/ precipitating ratio at the Western drainage area

Year	Flood volume [mcm]	Runoff / percipitation ratio [%]
1986/87	168	3.7
1987/88	200	4.4
1988/89	45	1.6
1989/90	74	2.4
1990/91	70	2.5
1991/92	967	15.6
1992/93	247	8.6
1993/94	38	2.7
1994/95	322	9.2
1995/96	78	3.7
1996/97	140	4.6
1997/98	84	3.7
1998/99	20	3.1
1999/00	111	4.8
2000/01	39	2.2
2001/02	154	4.6
2002/03	346	7.5
2003/04	116	5.6
2004/05	147	3.01
2005/06	74	2.8
2006/07	60	2.5
2007/08	59	1.8
2008/09	72	3.6
2009/10	118	3.9
Average	**165**	**4.5**
Median	**107**	**3.7**

Table 2: Average and median flood volumes in the Western drainage area

Period	Flood volumes (mcm)
Average:1985 -2009	210
Median:1985 -2008	157
Average:1993 -2009	178
Median:1993 -2009	138

3. Summary

- 90% of the flood volumes in Israel are coming from the Western drainage area.
- The average flood volumes for the period 1993-2009 is 178 mcm and the median is 138 mcm.
- The salinity concentration is the flood water is mostly under 100 mg/l.
- The monitored area covered by hydrometric stations in the western drainage area is 87% of out of the total Western drainage area. The water volumes for the rest 13% of the area was calculated according to runoff coefficients.