1. **Sardooi et al., Modeling the water security in a watershed using the water footprint concept and water scarcity indicators, Water Supply Vol 24 No 1, 235 doi: 10.2166/ws.2023.323**
   (water security in a watershed in Iran)

**Water stress index**

**WSI = WU / WRA,** where WU = water use, WRA = water resources availability

| WSI | 0-0.15 | no water stress |
|---|---|---|
| … | | |
| WSI | 0.81-0.9 | very high water stress |
| WSI | 0.91-1 | extreme water stress |

2. **Jun et al., WATER SECURITY ASSESSMENT BASED ON THE CONCEPT OF BLUE AND GREEN WATER FOOTPRINTS, E-proceedings of the 38th IAHR World Congress, September 1-6, 2019, Panama City, Panama, doi:10.3850/38WC092019-0474**
   (water security assessment, Korea, Modelling with SWAT)

Blue water footprint $BW_{FP}$ = consumptive water use = difference between water withdrawal and returned flow (Hoekstra et. Al., 2011). According to OECD (2015): returned flows are 65% of domestic and industrial water use, and 35% of agricultural water use

**Blue water scarcity:**

$$BW_{scarcity} = BW_{footprint} / BW_{availability}$$

3. **Rodrigues et al. Assessing uncertainties in surface water security: An empirical multimodel approach, WRR, doi:10.1002/2014WR016691**
   (assessing uncertainty in surface water security (Brazil, USA) (SWAT and HYMOD modelling))

Water Security indicators:

**Water Scarcity = Water Consumption /Median Water Provision**

**Water Vulnerability = Water Abstraction / Low Water Provision**

4. **Smakhtin and P. Doell, Environmental water requirements and glovbal water availability, at www.researchgate.net, No. 228362098:**
   (environmental water requirements and water stress indicator)

**"Traditional" Water stress indicator: WSI = Withdrawals / MAR,**
**New Environmental Water stress indicator: EWSI = Withdrawals / (MAR – EWR),**
where = mean annual runoff (MAR) = Total water resources in a river basin; EWR = environmental water requirements (range globally from 20 to 50% of total available water)

Categorization of "Environmental Water Scarcity":
| WSI < 0. 3 | slightly exploited |
|---|---|
| 0.3 < WSI < 0.6 | moderately exploited |
| 0.6 < WSI < 1 | heavily exploited |
| WSI > 1 | overexploited |

Two global maps: WSI and EWSI (Figs. 6 and 7)