

## REFERENCES

- Abbott, M. B. & Refsgaard, J. Ch. (1996) *Distributed Hydrological Modelling*. Water Science and Technology Library 22. Kluwer Academic Publishers, Dordrecht, The Netherlands.
- Bader, J. C. (1992) Consignes de gestion du barrage à vocation multiple de Manantali: détermination des côtes limites à respecter dans la retenue. *Hydrol. Continent.* **7**, 3–12.
- Bagirathan, V. R. & Shaw, E. M. (1978) Rainfall depth-duration-frequency studies for Sri Lanka. *J. Hydrol.* **37**, 223–239.
- Beaumont, P. (1968) Qanats on the Varamin Plain, Iran. *Trans. Inst. Brit. Geogr.* **45**, 169–179.
- Beaumont, P. (1971) Qanat systems in Iran. *Hydrol. Sci. Bull.* **16**(1), 39–50.
- Bell, J. P. (1976) *Neutron Probe Practice*. Institute of Hydrology Report no. 19, Wallingford, UK.
- Bell, J. P. & McCulloch, J. S. G. (1966) Soil moisture estimation by the neutron scattering method in Britain. *J. Hydrol.* **4**, 254–263.
- Beran, M. A. & Sutcliffe, J. V. (1972) An index of flood-producing rainfall based on rainfall and soil moisture deficit. *J. Hydrol.* **17**, 229–236.
- Bernier, J. (1956) Sur l'application des diverses lois limites des valeurs extrêmes aux débits de crue. *La Houille Blanche* **5**, 718–725.
- Beven, K. J. (2001) *Rainfall–Runoff Modelling: The Primer*. John Wiley and Sons, Chichester, UK.
- Bishop, W. W. (1969) Pleistocene stratigraphy in Uganda. *Geological Survey Uganda, Memoir 10*. Entebbe, Uganda.
- Black, A. R. & Law, F. M. (2004) Development and utilization of a national web-based chronology of hydrological events. *Hydrol. Sci. J.* **49**(2), 237–246.
- Blackie, J. R., Edwards, K. A. & Clarke, R. T. (eds) (1979) Hydrological research in East Africa. *E. Afr. Agric. For. J.* **43** (Special Issue).
- Bras, R. G. & Rodriguez-Iturbe, I. (1994) *Random Functions and Hydrology*. Dover Books, New York, USA.
- Brown, R. H. (1953) Selected procedures for analysing aquifer test data. *J. Am. Water Works Assoc.* **45**, 844–866.
- Butzer, K. W. (1971) Recent history of an Ethiopian delta. *University of Chicago Geography Department Research Paper 136*. Chicago, USA.
- Calder, I. R. & Neal, C. (1984) Evaporation from saline lakes: a combination approach. *Hydrol. Sci. J.* **29**(1), 89–97.
- Centre for Ecology & Hydrology (CEH) (2001) *Regional Flood Frequency Analysis Software (FLOODS)*. CEH, Wallingford, UK.
- Chow, V. T. (ed.) (1964) *Handbook of Applied Hydrology*. McGraw-Hill, New York, USA.

- Chow, V. T., Maidment, D. R. & Mays, L. W. (1988) *Applied Hydrology*. McGraw-Hill, New York, USA.
- Cole, J. A. (1973) Examples of flow-balance solutions for aquifer T and S by an automatic optimisation procedure. *Water Research Association TM 85*. Medmenham, UK.
- Cunnane, C. (1978) Unbiased plotting positions—a review. *J. Hydrol.* **37**, 205–222.
- Doorenbos, J. & Pruitt, W. U. (1977) *Crop Water Requirements*. Irrigation and Drainage Paper 24. Food and Agriculture Organization, Rome, Italy.
- Drew, F. (1875) *The Jummoo and Kashmir Territories: A Geographical Account*. Edward Stanford, London, UK.
- Eagleson, P. S. (2002) *Ecohydrology: Darwinian Expression of Vegetation Form and Function*. Cambridge University Press, UK.
- El Moushid, B. E. F., El Awad, O. M. A. & Ahmed, S. E. (1997) Environmental effect of the Blue Nile sediment on reservoirs and irrigation canals. In: *5th Nile 2002 Conf.* (Addis Ababa, Ethiopia).
- FAO (1993) *A Climatic Database for Irrigation Planning and Management*. Irrigation and Drainage Paper 49. Food and Agriculture Organization, Rome, Italy.
- Farquharson, F. A. K. & Sutcliffe, J. V. (1998) Regional variations of African river flows. In: *Water Resources Variability in Africa during the XXth Century* (ed. by E. Servat, D. Hughes, J.-M. Fritsch & M. Hulme) (Proc. Abidjan '98 Conf., Côte d'Ivoire, November 1998), 161–169. IAHS Publ. 252. IAHS Press, Wallingford, UK.
- Farquharson, F. A. K., Lowing, M. J. & Sutcliffe, J. V. (1975) Some aspects of design flood estimation. In: *Inspection, Operation and Improvement of Existing Dams* (ed. by A. I. B. Moffat) (Symposium at Newcastle upon Tyne, Sept. 1975), 4.7-1–4.7-9. British National Commission on Large Dams/University of Newcastle upon Tyne, UK.
- Farquharson, F. A. K., Meigh, J. R. & Sutcliffe, J. V. (1992) Regional flood frequency analysis in arid and semi-arid areas. *J. Hydrol.* **138**, 487–501.
- Farquharson, F. A. K., Sutcliffe, J. V. & Meigh, J. R. (1993) Caractéristiques statistiques de la crue régionale en Afrique de l'Ouest. *Hydrol. Continent.* **8**, 3–16.
- Farquharson, F. A. K., Plinston, D. T. & Sutcliffe, J. V. (1996) Rainfall and runoff in Yemen. *Hydrol. Sci. J.* **41**(5), 797–811.
- Flood Estimation Handbook (1999) See: Institute of Hydrology (1999).
- Flood Studies Report (1975) See: Natural Environment Research Council (1975).
- Fréchet, M. (1927) Sur la loi de probabilité de l'écart maximum. *Annales de la Société Polonaise de Mathématiques* **6**, 93–117. Krakow, Poland.
- Gardner, C. M. K., Robinson, D. A., Blyth, K. & Cooper, J. D. (2001) Soil water content. In: *Soil and Environmental Analysis: Physical Methods* (second edn) (ed. by K. A. Smith & C. E. Mullins), 1–64. Marcel Dekker Inc., New York, USA.
- Garstin, W. (1904) Report upon the basin of the Upper Nile (In a dispatch from His Majesty's Agent and Consul-General at Cairo). *Parliamentary Accounts and Papers 1904* **111**, 315–735.
- Gash, J. H. C. (1979) An analytical model of rainfall interception by forests. *Quart. J. Roy. Met. Soc.* **105**, 43–55.
- Grijzen, J. G., Snoeker, X. C., Vermeulen, C. J. M., Mohamed el Amin Moh. Nur & Yasir Abbas Mohamed (1992) An information system for flood early warning. In: *Third Int. Conf. on Floods and Flood Management*, 263–289.
- Grindley, J. (1970) Estimation and mapping of evaporation. In: *World Water Balance*, vol. 1, 200–213. IAHS Publ. 92. IAHS Press, Wallingford, UK.

- Grove, A. T., Street, F. A. & Goudie, A. S. (1975) Former lake levels and climate change in the rift valley of southern Ethiopia. *Geogr. J.* **141**, 177–202.
- Gumbel, E. J. (1941) Probability interpretation of the observed return period of floods. *Trans. Am. Geophys. Un.*, Part III, 836–850.
- Gunston, H. (1998) *Field Hydrology in Tropical Countries: A Practical Introduction*. Intermediate Technology Publications, London, UK.
- Hardy, S., Dugdale, G., Milford, J. R. & Sutcliffe, J. V. (1989) The use of satellite derived rainfall estimates as inputs to flow prediction in the River Senegal. In: *New Directions for Surface Water Modelling* (ed. by M. L. Kavvas) (Proc. Baltimore Symp., May 1989), 23–30. IAHS Publ. 181. IAHS Press, Wallingford, UK.
- Herschy, R. (2003) *World Catalogue of Maximum Observed Floods*. IAHS Publ. 284. IAHS Press, Wallingford, UK.
- Hewitt, K. (1982) Natural dams and outburst floods of the Karakorum Himalaya. In: *Hydrological Aspects of Alpine and High Mountain Areas* (ed. by J. W. Glen), 259–269. IAHS Publ. 138. IAHS Press, Wallingford, UK.
- Hodnett, M. G. & Bell, J. P. (1986) Soil moisture investigations of groundwater recharge through black cotton soils in Madhya Pradesh, India. *Hydrol. Sci. J.* **31**(3), 361–381.
- Holder, R. L. (1985) *Multiple Regression in Hydrology*. Institute of Hydrology, Wallingford, UK.
- Hosking, J. R. M., Wallis, J. R. & Wood, E. F. (1984) Estimation of the generalised extreme value distribution by the method of probability weighted moments. *Technometrics* **27**, 251–261.
- Howell, P. P., Lock, J. M. & Cobb, S. M. (eds) (1988) *The Jonglei Canal: Impact and Opportunity*. Cambridge University Press, UK.
- Hurst, H. E. (1952, 1957 2nd enlarged edn) *The Nile*. Constable, London, UK.
- Hurst, H. E. & Phillips, P. (1938) *The Hydrology of the Lake Plateau and Bahr el Jebel. The Nile Basin*, vol. V. Government Press, Cairo, Egypt.
- Hurst, H. E., Black, R. P. & Simaika, Y. M. (1946) *The Future Conservation of the Nile. The Nile Basin*, vol. VII. Government Press, Cairo, Egypt.
- Institute of Hydrology (1978) Nile Waters Study: Hydrology. Report to Sir Alexander Gibb & Partners. Institute of Hydrology, Wallingford, UK.
- Institute of Hydrology (1993) *HYDATA v 3.1 Operation Manual*. Institute of Hydrology, Wallingford, UK.
- Institute of Hydrology (1999) *Flood Estimation Handbook: Procedures for Flood Frequency Estimation*, five vols. Institute of Hydrology, Wallingford, UK.
- Institution of Civil Engineers (1978) *Floods and Reservoir Safety: An Engineering Guide*. Institution of Civil Engineers (ICE), London, UK.
- ISO (1993) *Soil Quality—Determination of Dry Matter and Water Content on a Mass Basis—Gravimetric Method*. Doc. ISO 11465. International Standards Organization, Geneva, Switzerland.
- ISO (1997a) *Soil Quality—Determination of Dry Matter and Water Content on a Volume Basis—Gravimetric Method*. Doc. ISO 11461. International Standards Organization, Geneva, Switzerland.
- ISO (1997b) *Measurement of Liquid Flow in Open Channels—Velocity-Area Methods*. Doc. ISO 748. International Standards Organization, Geneva, Switzerland.
- Jenkinson, A. F. (1955) The frequency distribution of the annual maximum (or minimum) values of meteorological elements. *Quart. J. Roy. Met. Soc.* **87**, 158–171.

- Jonglei Investigation Team (1954) *The Equatorial Nile Project and its Effects in the Anglo-Egyptian Sudan. Report of the Jonglei Investigation Team*, four vols. Sudan Government, Khartoum.
- Kirby, C., Newson, M. D. & Gilman, K. (1991) *Plynlimon Research: The First Two Decades*. Institute of Hydrology, Report no. 109, Wallingford, UK.
- Klein, C. (1965) On the fluctuations of the level of the Dead Sea since the beginning of the 19th century. *Hydrological Paper no. 7, Israel Hydrological Service*.
- Knight, E. F. (1893) *Where Three Empires Meet*. Longmans Green, London, UK.
- Knill, J. L. & Jones, K. S. (1968) Ground-water conditions in Greater Tehran. *Quart. J. Engng Geol.* **1**, 181–194.
- Lazenby, J. B. C. & Sutcliffe, J. V. (1994) Transitional control of the River Senegal. In: *Integrated River Basin Development* (ed. by C. Kirby & W. R. White), 503–513. John Wiley & Sons, Chichester, UK.
- Linsley, R. K., Kohler, M. A. & Paulhus, J. L. H. (1958) *Hydrology for Engineers*. McGraw-Hill, New York, USA.
- Lyons, H. G. (1906) *The Physiography of the River Nile and its Basin*. Survey Department, Cairo, Egypt.
- McMahon, T. A. & Mein, R. G. (1978) *Reservoir Capacity and Yield*. Developments in Water Science no. 9. Elsevier, Amsterdam, The Netherlands.
- Maidment, D. R. (1993) *Handbook of Hydrology*. McGraw Hill, New York, USA.
- Mandeville, A. N., O'Connell, P. E., Sutcliffe, J. V. & Nash, J. E. (1970) River flow forecasting through conceptual models: Part III, The Ray catchment at Grendon Underwood. *J. Hydrol.* **11**, 109–128.
- Meigh, J. R. (1995) The impact of small farm reservoirs on urban water supplies in Botswana. *Natural Resources Forum* **19**(1), 71–93.
- Meigh, J. R., Farquharson, F. A. K. & Sutcliffe, J. V. (1999) A worldwide comparison of regional flood estimation methods and climate. *Hydrol. Sci. J.* **42**(2), 225–244.
- Midgley, D. C. (1952) A preliminary study of the surface water resources of the Republic of South Africa. PhD Thesis, University of Natal, South Africa.
- Midgley, D. C. & Pitman, W. V. (1969) *Surface Water Resources of South Africa*. Report no. 2/69. Hydrological Research Unit, University of Witwatersrand, South Africa.
- Migahid, A. M. (1948) *Report on a Botanical Excursion to the Sudd Region*. Fouad I University Press, Cairo, Egypt.
- Migahid, A. M. (1952) *Further Observations on the Flow and Loss of Water in the "Sudd" Swamps of the Upper Nile*. Fouad I University Press, Cairo, Egypt.
- Monteith, J. L. (1985) Evaporation from land surfaces: progress in analysis and prediction since 1948. In: *Advances in Evapotranspiration*, 4–12. Am. Soc. Agric. Engrs.
- Moss, M. E. (1982) *Concepts and Techniques in Hydrological Network Design*. WMO Operational Hydrology Report no. 19. World Meteorological Organization, Geneva, Switzerland.
- Nash, J. E. (1960) A note on a investigation into two aspects of the relation between rainfall and storm runoff. In: *Surface Waters, Proc. IAHS General Assembly Helsinki*, vol. 1, 567–578. IAHS Publ. 51. IAHS Press, Wallingford, UK.
- Nash, J. E. & Sutcliffe, J. V. (1969) Flood-wave formation. In: *Hydrological Forecasting*, 147–155. WMO Technical Note no. 92. World Meteorological Organization, Geneva, Switzerland.
- Nash, J. E. & Sutcliffe, J. V. (1970) River flow forecasting through conceptual models: Part I, A discussion of principles. *J. Hydrol.* **10**, 282–290.

- Natural Environment Research Council (NERC) (1975) *Flood Studies Report*, five vols. NERC, Wallingford, UK.
- Newson, M. D. (1992) *Land, Water and Development: River Basin Systems and Their Sustainable Management*. Routledge, London, UK.
- Parks, Y. P. & Gustard, A. (1982) A reservoir storage yield analysis for arid and semi-arid climates. In: *Optimal Allocation of Water Resources* (ed. by M. J. Lowing) (Proc. Exeter Symposium, July 1982), 49–57. IAHS Publ. 135. IAHS Press, Wallingford, UK.
- Parks, Y. P. & Smith, P. J. (1983) Factors affecting the flow of aflaj in Oman: a modelling study. *J. Hydrol.* **65**, 293–312.
- Parks, Y. P. & Sutcliffe, J. V. (1987) The development of hydrological yield assessment in NE Botswana. In: *Proc. Brit. Hydrol. Soc. National Hydrology Symposium, Hull*, 12.1–12.11.
- Penman, H. L. (1948) Natural evaporation from open water, bare soil and grass. *Proc. Roy. Soc.* **193**, 120–145.
- Penman, H. L. (1950) The water balance of the Stour catchment area. *J. Instn Water Engrs* **4**(6), 457–469.
- Penman, H. L. (1963) *Vegetation and Hydrology*. Commonwealth Agricultural Bureaux, Farnham Royal, UK.
- Pereira, H. C. (ed.) (1962) Hydrological effects of changes in land use in some East African catchment areas. *E. Afr. Agric. For. J.* **27** (Special Issue).
- Piper, B. S., Plinston, D. T. & Sutcliffe, J. V. (1986) The water balance of Lake Victoria. *Hydrol. Sci. J.* **31**(1), 25–47.
- Piper, B. S., Sutcliffe, J. V. & Parks, Y. P. (1994) The Victoria Project, Sri Lanka: Hydrological analysis for Victoria dam. *Proc. Civ. Engrs Water, Marit. & Energy* **106**, 43–52.
- Pitman, W. V. (1973) *A Mathematical Model for Generating Monthly River Flows from Rainfall Data in South Africa*. Report no. 2/73. Hydrological Research Unit, University of Witwatersrand, South Africa.
- Price, M. (1996) *Introducing Groundwater*. Nelson Thornes, London, UK.
- Reed, D. W. (1999) *Flood Estimation Handbook* vol. 1: *Overview*. Institute of Hydrology, Wallingford, UK.
- Rodda, J. C. (1962) An objective method for the assessment of areal rainfall amounts. *Weather* **17**, 54–59.
- Rodier, J. A. & Roche, M. (1984) *World Catalogue of Maximum Observed Floods*. IAHS Publ. 143. IAHS Press, Wallingford, UK.
- Rosenbrock, H. H. (1960) An automatic method of finding the greatest or least value of a function. *Computer J.* **3**.
- Rushton, K. R. (2003) *Groundwater Hydrology: Conceptual and Computational Models*. John Wiley & Sons, Chichester, UK.
- Sene, K. J. & Plinston, D. T. (1994) A review and update of the water balance of Lake Victoria in East Africa. *Hydrol. Sci. J.* **39**(1), 47–63.
- Shahin, M. (2002) *Hydrology and Water Resources of Africa*. Kluwer Academic Publishers, Dordrecht, The Netherlands.
- Shaw, E. M. (1994) *Hydrology in Practice*, third edn. Chapman Hall, London, UK.
- Shaw, J. (2000) Sanchi and its archaeological landscape: Buddhist monasteries, settlements and irrigation works in central India. *Antiquity* **74**, 775–776.
- Shaw, J. & Sutcliffe, J. V. (2001) Ancient irrigation works in the Sanchi area: an archaeological and hydrological investigation. *South Asian Studies* **17**, 55–75.

- Shaw, J. & Sutcliffe, J. V. (2003) Ancient dams, settlement archaeology and Buddhist propagation in central India: the hydrological background. *Hydrol. Sci. J.* **48**(2), 277–291.
- Smith, P. J. & Piper, B. S. (1978) A non-linear optimisation method for the estimation of aquifer parameters. *J. Hydrol.* **39**, 255–271.
- Strangeways, I. C. (2003) *Measuring the Natural Environment* (second edn). Cambridge University Press, UK.
- Sumanasekere, P. (1977) An analysis of rainstorms in the Upper Mahaweli catchment. Meteorological Department, Colombo, Sri Lanka. Unpublished report.
- Sutcliffe, J. V. (1957) The hydrology of the Sudd region of the upper Nile. PhD Thesis, University of Cambridge, UK.
- Sutcliffe, J. V. (1966) The assessment of random errors in areal rainfall estimation. *Hydrol. Sci. Bull.* **11**(3), 35–42.
- Sutcliffe, J. V. (1967) Report on ground-water extraction on Bahrain Island and coastal area. British Geological Survey/Institute of Hydrology Report to ODA.
- Sutcliffe, J. V. (1974) A hydrological study of the southern Sudd region of the upper Nile. *Hydrol. Sci. Bull.* **19**(2), 237–255.
- Sutcliffe, J. V. (1975) Choice of estimation techniques. In: *Flood Studies Conference*, 67–69. Institution of Civil Engineers, London, UK.
- Sutcliffe, J. V. (1978) *Methods of Flood Estimation: a Guide to the Flood Studies Report*. Report no. 49, Institute of Hydrology, Wallingford, UK.
- Sutcliffe, J. V. (1987) The use of historic records in flood frequency analysis. *J. Hydrol.* **96**, 159–171.
- Sutcliffe, J. V. (1990) The use of hydrological models in water resources planning. In: *United Nations International Workshop on Water Resources Planning and Management in China* (ed. by R. M. North), 107–133. UNDTCD/SSTC, New York, USA.
- Sutcliffe, J. V. (1995) Hydrology in the developing world. In: *Time and the River: Essays by Eminent Hydrologists* (ed. by G. W. Kite), 59–92. Water Resources Publications, LLC, Highlands Ranch, Colorado, USA.
- Sutcliffe, J. V. (1996) The role of local hydrological studies in the water resources management of the Nile basin. In: *4th Nile 2002 Conference* (Kampala, Uganda).
- Sutcliffe, J. V. & Carpenter, T. G. (1967) The assessment of runoff from a mountainous and semi-arid area in western Iran. In: *Hydrological Aspects of the Utilization of Water* (IAHS General Assembly of Bern), 383–394. IAHS Publ. 76, IAHS Press, Wallingford, UK.
- Sutcliffe, J. V. & Farquharson, F. A. K. (1998) Flood frequency studies using regional methods. In: *Statistical and Bayesian Methods in Hydrological Sciences* (ed. by E. Parent, P. Hubert, B. Bobée & J. Miquel), 341–355. IHP-V Technical Documents in Hydrology, UNESCO, Paris, France.
- Sutcliffe, J. V. & Green, C. S. (1986) Water balance investigations of recharge in Madhya Pradesh, India. *Hydrol. Sci. J.* **31**(3), 383–394.
- Sutcliffe, J. V. & Knott, D. G. (1987) Historical variations in African water resources. In: *The Influence of Climate Change and Climatic Variability on the Hydrologic Regime and Water Resources* (ed. by S. I. Solomon, M. Beran & W. Hogg) (Proc. Vancouver Symp., August 1987), 463–475. IAHS Publ. 168, IAHS Press, Wallingford, UK.
- Sutcliffe, J. V. & Lazenby, J. B. C. (1989) Hydrology and river control on the Niger and Senegal. In: *The Sahel Forum* (Ouagadougou, Burkina Faso), 611–620. International Water Resources Association, Urbana, Illinois, USA.

- Sutcliffe, J. V. & Lazenby, J. B. C. (1990) Hydrological data for surface water resources assessment. In: *The Hydrological Basis for Water Resources Management* (ed. by U. Shamir & Chen Jiaqi) (Proc. Beijing Symp., October 1990), 251–259. IAHS Publ. 197, IAHS Press, Wallingford, UK.
- Sutcliffe, J. V. & Parks, Y. P. (1982) *A Hydrological Estimate of the Effects of the Jonglei Canal on Areas of Flooding*. Report to FAO. Institute of Hydrology, Wallingford, UK.
- Sutcliffe, J. V. & Parks, Y. P. (1987) Hydrological modelling of the Sudd and Jonglei Canal. *Hydrol. Sci. J.* **32**(2), 143–159.
- Sutcliffe, J. V. & Parks, Y. P. (1989) Comparative water balances of selected African wetlands. *Hydrol. Sci. J.* **34**(1), 49–62.
- Sutcliffe, J. V. & Parks, Y. P. (1996) Hydrological controls of Sudd ecology. In: *Water Management and Wetlands in Sub-Saharan Africa* (ed. by M. C. Acreman & G. E. Hollis), 51–72. IUCN, Gland, Switzerland.
- Sutcliffe, J. V. & Parks, Y. P. (1999) *The Hydrology of the Nile*. IAHS Special Publ. 5. IAHS Press, Wallingford, UK.
- Sutcliffe, J. V. & Piper, B. S. (1986) Bilan hydrologique en Guinée et Togo-Bénin. *Hydrol. Continent.* **1**, 51–61.
- Sutcliffe, J. V. & Rangeley, W. R. (1960a) Variability of annual river flow related to rainfall records. In: *IAHS Commission of Surface Waters (Helsinki Assembly)*, 182–192. IAHS Publ. 51, IAHS Press, Wallingford, UK.
- Sutcliffe, J. V. & Rangeley, W. R. (1960b) An estimation of the long-term yield of a large aquifer at Tehran. In: *IAHS Commission of Subterranean Waters (Helsinki Assembly)*, 264–271. IAHS Publ. 52, IAHS Press, Wallingford, UK.
- Sutcliffe, J. V. & Swan, C. H. (1970) The prediction of actual evaporation in semi-arid areas. In: *Symposium on World Water Balance*, 213–224. IAHS Publ. 92, IAHS Press, Wallingford, UK.
- Sutcliffe, J. V. & Wigdery, N. J. (1997) The problems of sustainable water resources management in Sudan. In: *Sustainability of Water Resources under Increasing Uncertainty* (ed. by D. Rosbjerg, N.-E. Boutayeh, A. Gustard, Z. W. Kundzewicz & P. F. Rasmussen) (Proc. Rabat Symp., April 1997), 259–265. IAHS Publ. 240, IAHS Press, Wallingford, UK.
- Sutcliffe, J. V., Agrawal, R. P. & Tucker, J. M. (1981) The water balance of the Betwa basin, India. *Hydrol. Sci. Bull.* **26**(2), 149–158.
- Sutcliffe, J. V., Dugdale, G. & Milford, J. R. (1989) The Sudan floods of 1988. *Hydrol. Sci. J.* **31**(3), 355–364.
- Tate, E. L., Sene, K. J. & Sutcliffe, J. V. (2001) A water balance study of the upper White Nile basin flows in the late nineteenth century. *Hydrol. Sci. J.* **46**(2), 301–318.
- Tate, E. L., Sutcliffe, J. V., Conway, D. & Farquharson, F. A. K. (2004) Water balance of Lake Victoria: update to 2000 and climate change modelling to 2100. *Hydrol. Sci. J.* **49**(4), 563–574.
- Thorntwaite, C. W. (1948) An approach toward a rational classification of climate. *Geogr. Rev.* **38**, 85–94.
- Turc, L. (1954) Calcul du bilan de l'eau: évaluation en fonction des précipitations et des températures. In: *Rapports de la Commission des Eaux de Surface*, vol. III (IAHS Rome Symp.), 188–202. IAHS Publ. 38, IAHS Press, Wallingford, UK.
- Underhill, H. W. (1967) Dead Sea levels and the PEF mark. *Palestine Exploration Quarterly*.

- 
- Vieux, B. E. (2001) *Distributed Hydrologic Modeling Using GIS*. Water Sciences and Technology Library 38. Kluwer Academic Publishers, Dordrecht, The Netherlands.
- Wadia, D. N. (1975) *Geology of India*. Tata McGraw-Hill, New Delhi, India.
- Ward, R. C. & Robinson, M. (2000) *Principles of Hydrology* (fourth edn). McGraw Hill, London, UK.
- Watson, K. K. (1966) An instantaneous profile method for determining the hydraulic conductivity of porous materials. *Water Resour. Res.* **2**(4), 709–715.
- Weiner, D. & Ben-Zvi, A. (1982) A stochastic dynamic programming model for the operation of the Mediterranean-Dead Sea Project. *Water Resour. Res.* **18**(4), 729–734.
- Wenzel, L. K. (1942) Methods for determining permeability of water-bearing materials. *US Geological Survey, Water-Supply Paper no. 887*.
- Willis, R. P. (1967) Geology of the Arabian Peninsula: Bahrain. *US Geological Survey Prof. Paper 560-E*.
- Wilson, E. M. (1990) *Engineering Hydrology* (fourth edn). Macmillan, London, UK.
- Wiltshire, S. E. (1986) Regional flood frequency analysis. II: Multivariate classification of drainage basins in Britain. *Hydrol. Sci. J.* **31**(3), 335–346.
- World Meteorological Organization (1994) *Guide to Hydrological Practices*. WMO, Geneva, Switzerland.