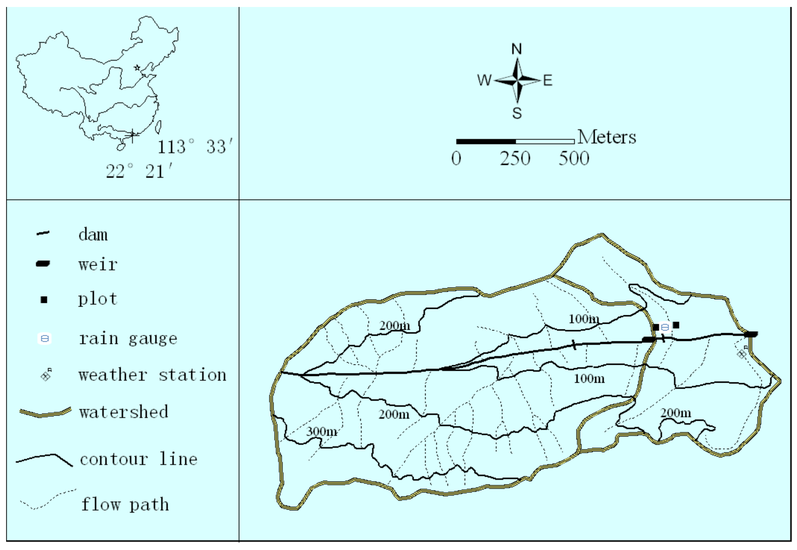
Zhuhai Campus Basin, Sun Yatsen University, China

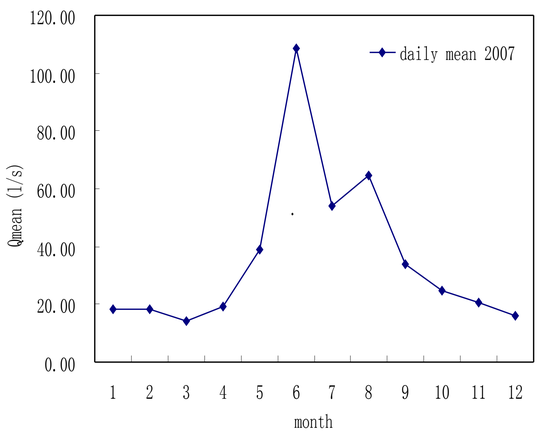
Basin characteristics

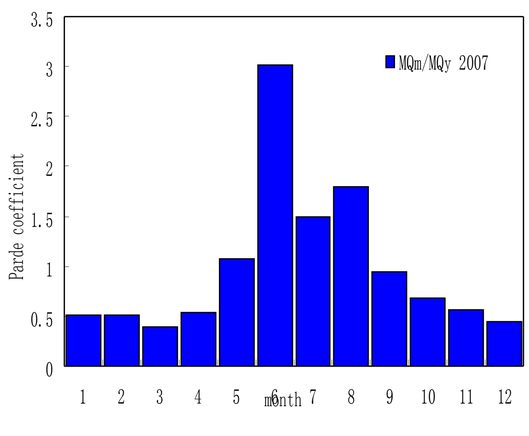
River Basin / River Basin (according EU-WFD)	Your text here.
Operation (from… to…)	Since 2005, still in operation
Gauge coordinates / Gauge datum:	22°21'; 113°33'
Catchment area:	1.3km² (the whole basin), 0.99 km² (the upper basin)
Elevation range:	20 — 412m
Basin type: (alpine, mountainous, lowland)	Hilly area
Climatic parameters: (mean precipitation, temperature and others)	1800-2000mm (annual precipitation), 1100mm/a (pan evaporation)
Land use:	Brushwood
Soils:	laterite
Geology:	granite
Hydrogeology: (Type of aquifers, hydraulic conductivity)	Your text here.
Characteristic water discharges: (Q_{min}, Q_{max}, Q_{mean})	8.7l/s, 710.08l/s, 35.6l/s (2007)

Map of the research basin



Mean hydrograph / Pardé flow regime





Special basin characteristics (hydrogeology, lakes, reservoirs etc.)

1. Two reservoirs inside the basin, not operated since 2000, when the campus was built up.
2. The basin is next to the sea, and the tide fluctuation is also measured every 30 min.
3. The depth of soil layer is well related to the vegetation, slope and etc. The depth is generally 2-3 m in the place where the slope is gentle with pine tree, while it is less than 1 m in the place with shrub or outcrop

Instrumentation and data

Measured hydrological parameters	Measuring period	Temporal resolution	Number of stations
Stream flow	Oct 2006 - cont	30min	2
precipitaion	Nov 2006 - cont	Impuls/0.1mm	3
evaporation	April 2006 - cont	daily	2
Temperature, Air pressure,Humidity,Radiation	Oct 2006 - cont	30min	1
Groundwater/Tide	Oct 2006 - cont	30min	17/1
Soil moisture, potential	Oct.2006-	30 min	3

Applied models

1. Baseflow separation models (Kalinin, digital filter, Smoothed minima, and etc)

2. FEFLOW

Main scientific results regarding base flow

1. Data series of 12h for 29 events at the upper weir were constructed for recession analysis by matching strip method. The master recession curve (MRC) was drawn. Recession constant for interflow K (i) and base flow K (b) was estimated to be 0.9622 and 0.9733, and recession index to be 0.03853 and 0.02706 respectively with an average of 0.0328.

2. Base flow analysis in the upper reach was operated by using smoothed minima, digital filter, Kalinin, and empirical methods, which have been proposed to separate base flow from the hydrograph. BFI was calculated to be a range of 0.43-0.86 for the year of 2007, while it shows a maximum of 0.96 in the dry season from November to March, and a minimum of 0.29 in the rainy season from April to October.

3. The average of D and ^{18}O value from the precipitation samples is -13.78‰ and -2.35‰, while it is -32.88‰ and -4.92‰ respectively for the river water. The average of the D and 18O value from the groundwater samples of recharge area is -41.30‰ and -5.97‰, indicating that groundwater is the main component of the stream flow. According to water and isotopic balance, the average ratio of groundwater contribution to the total flow during the period of February to May was estimated to be 73.7% in the upper reach and 68% in the lower reach.

4. Compared BFI in the upper reach during the period of February to May by different base flow separation methods, and that calculated by the 3rd digital filter method is the most close to the isotope analysis, which is 0.73.

Key references for the basin

1. Fu CS, Chen JY, Zeng SQ, Zhao XF, 2008. Statistical analysis on impact of tide water table fluctuation in coastal aquifer. SHUILI XUEBAO, 39: 1365-1376 (in Chinese)
2. Zhao XF, Chen JY, Tang CY, Zeng SQ, Lu YT, 2007. Hydrochemical characteristics and evolution of groundwater in a small catchment of Pearl River delta. Ecology and Environment, 16(6): 1620-1626 (in Chinese)
3. Zhao XF, Chen FJ, Chen JY*, Tang CY, 2008. Hydrochemical characteristics and evaluation of nitrate contamination in a coastal urban aquifer, Xiangzhou District, Zhuhai City, China. IAHS Redbook 324, 11-17.

Contact

Prof. Dr Jianyao Chen
Department of Water Resources and Environment
School of Geography and Planning
Sun Yat-sen University
chenjyao@mail.sysu.edu.cn or chenjianyao@hotmail.com