

Collection of worldwide field studies on the hyporheic exchange across a broad range of hydrogeological, topographical and geological settings. Table shows references, geographical zone and state, river name, and information on reach, valley and, catchment scale: geology (sediment size and hydraulic conductivity), topographical/morphological, ecological (in-channel vegetation), anthropogenic (agricultural or human infrastructure).

Source	Reach	Valley				Catchment								
		Geological-sediment size and hydraulic conductivity	Topographical	Ecological	Anthropogenic	Hydrological	Hydrogeological	Topographical	Ecological	Anthropogenic	Hydrogeological	Topographical	Anthropogenic	
Angermann et al., 2012	midsize gravel, different sizes of sand, fine silty materials.	hydraulic conductivities: 10^{-3} to 10^{-5} ms^{-1} and 10^{-8} to 10^{-9} ms^{-1} (Krause et al., 2012)	Meander, pool-riffle-pool bedforms	/	/	Mean discharge is 0.9 m^3 s ⁻¹ with Q95 of 0.4 m^3 s ⁻¹ and Q10 of 1.39 m^3 s ⁻¹	/	lowland	/	agricultural	Europe, UK; Atlantic biogeographic region; River Tern; Rainfall 583 mm / yr	Dominant geology is Permo-Triassic sandstone	/	/
Anibas et al., 2012	loamy sand deposits; thick deposits of fluvio-glacial sands and gravels which are covered by a variety of organic soil.	see Table 2 for hydraulic conductivities	meander and straight section steep banks	banks mostly are covered with / reed plants.	regular flood event after snowmelt in the upper catchment peatland is mostly groundwater fed	The morainic plateau is composed of heterogeneous loamy sand deposits. The flat alluvial valleys are filled with thick deposits of fluvio-glacial sands and gravels which are covered by a variety of organic soils.	lowland mashes and peat lenses (2-5 cm)	oak-beech forests, 2-reed vegetation in the center of the valley and sedges closer to the slope crack	arable lands meadow and pastures in the lower section of the catchment	Europe/Poland/Continental biogeographic region 550-700mm/yr 3 subcatchments	extensive depression formed during the last glaciations. Unconsolidated aquifers intermixed with confined ones	/	/	mostly natural but in the low areas of the catchment meadows and pastures
Anibas et al., 2009	fine sand and some organic material	thermal conductivity: $1.8 \text{ Js}^{-1} \text{ m}^{-1} \text{ K}^{-1}$	straight and canalized	/	/	/	lowland	/	agricultural landuse	Europe; Belgium; Continental biogeographic region	/	/	agricultural landuse and weirs structures	
Aritzen et al., 2006	cobble (>64 to <=128mm) in a matrix of fine sand (>0.062 to <=0.5mm). At rkm 602 site, the median grain size—D50 was 57.7mm. At rkm 582 site, the dominant substrate was coarse gravel (>16 to <=64mm) in a matrix consisting mostly of fine sand (<0.062 to <=0.5 mm). The D50 at rkm 582 was 35.5mm. At rkm 577, the dominant substrate was coarse gravel (>16 to <=64mm) in a matrix consisting of fine sand. However, there was a silt component at rkm 577 much larger than at the other two locations. The D50 at rkm 577 was 22.3mm.	hydraulic conductivities: $8.8 \times 10^{-3} \text{ cms}^{-1}$ to $2.9 \times 10^{-4} \text{ cms}^{-1}$	/	/	/	gaining condition	unconfined aquifer	various topography	/	/	USA; Washington; Columbia River; Hanford Reach; Continental biogeographic region	Miocene to Pliocene of the Ringold Formation, Pleistocene flood gravels of the Hanford Formation	/	/
Bourke et al., 2014	/	hydraulic conductivity 1500 and 3700 md^{-1}	straight, section with pools, riffles and glides bedforms	/	/	losing	/	lowland	/	/	Australia; Subtropical biogeographic region; Marillana Creek	pisolitic goethite, chert and dolerite	/	mine
Briggs et al., 2010	hallow soils and glacial deposits	/	meander section	beaver activity and wood dams	/	/	/	med/low gradient	/	wetland, agricultural land, woodland and urban areas	USA; Massachusetts; Ipswich River; humid continental biogeographic region	/	/	three main stem anthropogenic dams
Czernuszkeno et al., 1998	/	/	Straight Low simosity	/	/	/	/	lowland	/	/	Europe/Moldavia; Borna, Byk and Koginik Rivers; Continental biogeographic region	/	/	/
Datry et al 2008	gravels, cobbles, and small boulders	/	riffles, prafluvial bars, terraces	annual grasses and herbs	/	larger gaining and losing sections of the valley	/	/	shrubs	/	New Zealand; Selwyn River, Atlantic biogeographic region	confined and semi-confined aquifers	/	/
Dujardin et al 2014	silty and clay- loam	hydraulic conductivities see Table 2	/	/	/	/	/	lowland	/	/	Europe; Belgium; Continental biogeographic region ;Zenne River	/	/	considerable chemical industrial activity
											Rainfall 852 mm/year			

Duke et al 2007	clay-rich vertisol	0.104 cm h ⁻¹	/	<i>J. ashei</i>	/	/	/	/	Riparian forest: <i>Ulmus crassifolia</i> , <i>Fraxinus texensis</i> , <i>Juniperus ashei</i>	agriculture, small	USA; Texas; Cow Bayou Stream; Humid Subtropical biogeographic region	Eagle Ford shale	/	Dam structure agriculture and rangeland small riparian forest of <i>Ulmus crassifolia</i> , <i>Fraxinus texensis</i> , <i>Juniperus ashei</i>
Edwardson et al., 2003	cobble, gravel, peat but variable according to site	hydraulic conductivities: see Table 3	pool riffles, meanders, Debris dam	/	/	/	/	braided, sinuous	<i>Carex aquatilis</i> and <i>Eriophorum vaginatum</i> <i>Betula nana</i>		USA; Alaska; Kuparuk River; Oceanic-Arctic biogeographic region	/	/	/
Fernald et al., 2001	gravel Holocene deposit	10 ⁻² and 10 ⁻³ m s ⁻¹	two large island complexes with anastomosing channels and extensive exposed gravels.	/	/	/	/	/	/	/	USA; Oregon; Willamette River; Humid-semiarid biogeographic region	Holocene alluvium	/	/
Gooseff et al., 2003	very porous	/	/	/	/	/	/	/	/	/	Antarctica; Delta Stream and Green Creek; Polar biogeographic region	/	/	/
Haggard et al., 2001	cobbles with some fines	/	/	/	/	/	shallow silt loams.	/	sycamore trees in Dry Creek and a mix of sycamore trees and other hardwoods in Cloud Creek and Cherokee Creek.	Dry Creek and Cherokee Creek had large grass pastures whereas the up-slope vegetation at Cloud Creek was characterized by humid-subtropical underbrush and forest layers	USA; Oklahoma; Dry Creek, Cloud Creek, and Cherokee Creek (Lake Euchla-Spavinaw Basin);	karstic	/	/
Hall et al., 2002	cobbles and boulders	/	debris dams	/	/	/	/	medium/low gradient	American beech sugar maple yellow birch		USA; New Hampshire; 13 Streams; Continental Biogeographic region	bedrock superficial	/	forested: <i>Fagus grandifolia</i> <i>Acer saccharum</i> <i>Betula alleghaniensis</i>
Hart et al., 1999	gravel and cobbles, bedrock outcrops	/	boulders and debris dams are	input of deciduous forest: leaves	/	/	/	/	deciduous forest		USA; Tennessee; West Fork of Walker Branch; Continental biogeographic region	bedrock outcrops	/	/
Harvey and Fuller, 1998 Harvey et al., 2003	sand and gravel	/	straight section cobbles and channel parallel bars at side and central channel	/	/	/	/	medium/low gradient	tamarisk seedlings, willows		USA; Arizona; Pinal Creek; semi-desert biogeographic region	regional aquifer composed of partially cemented basin fill, a more shallow one is present (sand and gravel). The aquifer presents igneous rock formations and can be constricted	/	/
Jones et al., 2008	basalt gravel, cobbles, and boulders intermixed with silt and sand lenses	300 to 700 m day ⁻¹	naturally unbranched	in-channel macrophytes vegetation (season dependent)	/	/	/	bedrock valley with spring	/	/	USA; Oregon; Umatilla River; humid-semidesertic biogeographic region	Columbia Plateau basalt	naturally unbranched	/
Kasahara et al., 2003	coarse-textured gravel	/	/	/	/	/	/	upland bedrock contrained and unconstrained sections	/	/	USA; Oregon; Lookout Creek; Humid-semiarid biogeographic region	/	/	forested <i>Pseudotsuga menziesii</i> , <i>Tsuga heterophylla</i> , <i>Thuja plicata</i> , <i>Alnus rubra</i> and <i>Salix</i> spp.
Kasahara et al., 2006	cobbles	<0.1m day ⁻¹ to >10 m day ⁻¹	riffles and step from restoration project	/	/	/	/	lowland	grass-vegetated floodplai	residential and agriculture fields	Canada; Ontario; Rouge River tributary 1 Rouge River tributary 2 Silver Creek; continental biogeographic region	unconfined aquifer	/	/
Kasahara et al., 2007	gravel bed channel, silt and clay	0.3 to >20m day ⁻¹	gravel bar and meander bends were selected for studying	/	/	/	/	/	willows along the banks	agricultural (crop and soya beans)	Canada; Ontario; Boyne River and others; continental biogeographic region	/	/	/

Kaser <i>et al.</i> , 2013	soft sediment	2.7–2.8x10 ⁹ ms ⁻¹	meander riffle-pool sequences	/	/	gaining	/	meanders within a narrow floodplain (<100)	/	/	Europe; UK; River Leith; Atlantic biogeographic Rainfall 900 mm/yr	aeolian Penrith Sandstone	/	/	
Knust <i>et al.</i> , 2009	cobbles and boulders	/	straighter and wider	/	/	/	/	lowland	coniferous forest	/	USA; Nevada; Truckee River; Desert biogeographic Rainfall 18cm/year	/	/	coniferous forests	
Krause <i>et al.</i> , 2013	Midsized gravel. Different sizes of sand. Fine silty materials	hydraulic conductivities 10 ⁻³ to 10 ⁻⁵ ms ⁻¹	meandering section steep river banks, pool-riffle-pool sequences	/	/	/	/	lowland	/	extensive agricultural land use	Europe; UK; River Tern; Atlantic biogeographic	Permo-Triassic sandstone	/	/	
Laenen and Bencala, 2001	sands, silts, and clays	/	meandering and braided channel with many islands and sloughs.	/	/	/	/	lowland alluvial fans	/	/	USA; Oregon; Willamette River; Humid-semiarid biogeographic	late Pleistocene	/	/	
Lamontagne and Cook, 2007	coarse sand, gravel, and cobble	porosity of ~0.4	/	/	/	/	/	/	/	/	Australia; Swamp Oak creek; Subtropical biogeographic region	/	/	/	
Lansdown <i>et al.</i> , 2012	sand, gravel, and cobbles on sands and silts	/	riffle and pool sequences	/	/	/	/	lowland	/	agricultural fields	Europe; UK; River Leith; Atlantic biogeographic	Permo-Triassic sandstone	/	/	
Lautz and Siegel, 2006 Lautz and Siegel, 2007	gravel and fine sand but also silt	hydraulic conductivity see Table 1 Lautz and Siegel 2006	meandering and straight sections	/	/	debris dams and small log dams (natural and non)	/	upland	/	/	USA; Wyoming; Red Canyon Creek Semi-arid Intermountain province	Phosphoria Formation. Chugwater Formation gravel terraces	/	/	livestock grazing
Malcolm <i>et al.</i> , 2005	Podzols, gleys and peats	/	/	/	/	mean discharge of 0.5 m ³ s ⁻¹ , varying between <0.01 m ³ s ⁻¹ in the summer and >23 m ³ s ⁻¹ during floods	/	upland	heather (Calluna) moorland	/	Europe; UK Glen Girmock; Atlantic biogeographic region	schists and gneisses	/	semi-natural heather (<i>Calluna</i>) moorland	
Malcolm <i>et al.</i> , 2010	overlain by glacial till and meltwater deposits and overlain by glacial and fluvio-glacial deposits.	/	deepened and straightened pool riffles/bars	/	/	/	/	lowland	/	heather moorland, and commercial and semi-natural forest in the lower catchment	Europe; UK Newmills Burn Girmock Burn; Atlantic biogeographic region	psammite and pelite, granite and schist	/	arable farming and livestock	
Malzone <i>et al.</i> , 2015	sand, gravel, clay, and till	/	pool and riffles sequences	/	/	gaining	/	gaining stream	/	/	USA; New York State; Elton Creek Continental biogeographic region	Glaciated Appalachian Plateau	/	Land use is primarily forest, dairy, and agriculture with few urban regions	
Morrice <i>et al.</i> , 1997	2% gravel 46% sand 42% silt 10% clay 36% gravel 53% sand 9% silt 2% clay boulders cobbles gravel and sand	/	/	/	/	/	/	upland	/	/	USA; New Mexico; Aspen Creek Calaveras Gollina Creek; Semiarid biogeographic region	Permian sandstone and siltstone Bandelier turf granite/gneiss	/	/	
Mouw <i>et al.</i> , 2009	gravel to sand	/	anastomosing channels pools	/	/	/	/	lowland Large alluvial flood plains	<i>Populus balsamifera</i> and shrub communities by <i>Salix</i> sp and <i>Alnus incana</i> on surfaces flooded. Forested benches are dominated by <i>P. balsamifera</i> , <i>Picea engelmannii</i> , <i>Pseudotsuga menziesii</i> , <i>Larix occidentalis</i> , <i>Abies lasiocarpa</i>	cottonwood and spruce forests	Alaska; Middle Flathead River Talkeetna River; Arctic biogeographic region	/	/	/	

Munz <i>et al.</i> , 2011	silt to coarse sand	/	meandering section of the river longitudinal pool-riffle-pool sequence	riparian reed and grass vegetation, wet grassland and sparse riparian soft-wood vegetation alongside	/	/	lowland narrow floodplain 100m wide steep slopes with occasional outcrops of the PTS bedrock	grassland vegetation	livestock grazing	Europe; UK River Leith; Atlantic biogeographic region Rainfall 900 mm/yr	Permotriassic Sandstone	/	/
Mutz <i>et al.</i> , 2000	Fine/ medium sand With some gravel	/	sinuous	<i>Alnus glutinosa</i> and <i>Carpinus petusbus</i> In channel wood	/	/	lowland many springs and small streamlets draining from the valley slopes into the stream	/	/	Europe; Germany; Schlaube Stream; Continental biogeographic region	/	/	/
Mutz <i>et al.</i> , 2003	coarse to fine sands	/	/	/	/	/	lowland	woodland	/	Europe; Germany; Schlaube Stream; Continental biogeographic region	/	/	/
O'Connor <i>et al.</i> , 2008	boulders	/	riffle-pool slope of 0.026 sinuosity ratio of 1.1	/	/	/	lowland	/	/	USA; California; Elder Creek; Mediterranean biogeographic region	/	/	/
Ock <i>et al.</i> , 2015	coarse gravel	/	4 channel-gravel features (bars and vegetated islands)	/	/	/	/	/	/	USA; California; The Trinity River; Mediterranean biogeographic region	/	/	Impounded by the Trinity Dam and the Lewiston Dam since 1964 Flow diverted into the Sacramento River for field irrigation
Pinay <i>et al.</i> , 2009	gravel	2x10 ⁴ and 3x10 ³ cms ⁻¹	/	/	/	/	/	willow <i>Salix</i> sp., moist tundra communities at low elevations; and extensive stands of green alder, <i>Alnus crispa</i> , at higher elevations. Little alder is found in riparian areas	/	Alaska; Lynx Creek; Arctic biogeographic region	/	boreal forest association of white spruce, <i>Picea glauca</i> , interspersed with balsam poplar, <i>Populus balsamifera</i>	/
Ruehl <i>et al.</i> , 2006	/	/	/	/	/	mean daily discharge 0 and 610 m ³ /s from 1939 to 2003.	lowland	/	/	USA; California; Pajaro River; Mediterranean biogeographic region. Rainfall 33-55 cm/yr	Holocene deposits, the Aromas Formation (Pleistocene), Purisima Formation (Pliocene)	/	agriculture land use
Sawyer <i>et al.</i> , 2012	Mix cobbles, gravel on silt	4.0 m d ⁻¹	two straight runs separated by a meander. Pool and riffle sequences	grasses and forbs.	/	/	lowland unconfined valley	/	/	USA; New Mexico; San Antonio Creek; Semiarid biogeographic region Rainfall 476 mm/yr	/	/	/
Stofleth <i>et al.</i> , 2008	silt and clay soils over sand	/	tortuous reach section mild channel slope	/	/	/	lowland straightened (upstream) and channelized (downstream) the chosen reach	/	Little Topashaw Creek: cultivated valley floors and forested hillslopes	USA; Mississippi; Topashaw Creek; Continental biogeographic region	/	/	/
Stonedahl <i>et al.</i> , 2012	gravel, pebble, and coarse sandy glacial	/	pools and riffles	/	/	/	lowland ditched and straightened	/	Goodwin Creek predominately is forest, pasture, and fallow lands agricultural fields	USA; Indiana; Sugar Creek; Continental biogeographic region	/	/	/
Storey <i>et al.</i> , 2003	recent alluvium	2 x 10 ⁻⁴ ms ⁻¹	/	/	/	/	lowland	/	/	Canada; Ontario; Speed River Continental biogeographic region	primary aquifer is in the dolomite bedrock. The bedrock is overlain by layers of low-permeability glacial till, kame, and outwash deposits	/	/
Swanson <i>et al.</i> , 2010	sand and gravel	3.2x10 ⁻⁵	losing condition of the reach and pool-riffle-pool sequence	banks stabilized by dense communities of grasses	/	/	sinuous, with steep stream banks	/	/	USA; New Mexico; Jaramillo Creek; Semiarid biogeographic region	/	/	/
Thomas <i>et al.</i> , 2003	colluvial sediments coarse material	/	steep colluvial sections	arge oak-hickory stands with cove hardwoods common along the stream channel	/	/	steep	mountain laurel (<i>Kalmia latifolia</i> L.) and rhododendron (<i>Rhododendron maximum</i> L.)	/	USA; North Carolina; Snake Den Branch; Continental biogeographic region; Rainfall 200 cm/yr	crystalline rock, schists, gneiss	/	/

Triska <i>et al.</i> , 1993	gravel	/	/	/	/	/	/	/	\	/	/	USA; California; Little Lost Man Creek; Continental biogeographic region	/	/	/
Wagenhoff <i>et al.</i> , 2014	gravels and sand	/	wood logs in both streams	/	/	/	/	/	upland	/	/	New Zealand; Kiripaka Stream Whakakai Stream; Atlantic biogeographic region	sedimentary sandstones and siltstones	/	Kiripaka Stream native forest in the headwaters and intensive pasture grazed by sheep and cattle. Whakakai Stream evergreen podocarp-hardwood forest and
Wagner <i>et al.</i> , 2003	gravel to fine	/	steep slope in the upstream section. Downstream section characterized by wetland area between the hill and the left bank	Riparian vegetation: <i>Salix caprea</i> L., <i>Salix myrsinifolia</i> <i>Picea abies</i> L., <i>Fraxinus excelsior</i> L., <i>Acer pseudoplatanus</i> L., <i>Fagus sylvatica</i> L. and <i>Corylus avellana</i> L. Also present but less abundant are <i>Acer platanoides</i> L., <i>Alnus incana</i> <i>Cornus sanguinea</i> L. and <i>Crataegus monogyna</i>	/	/	/	/	alpine	/	/	Europe; Austria; Oberer Seebach; Continental biogeographic region	/	/	/
Wondzell <i>et al.</i> , 2009	fine gravel to sand	/	low gradient	/	/	/	/	/	lowland	/	natural	USA; Alaska; Bambi Creek; Arctic biogeographic region Rainfall 1600 mm/a	/	/	/
Wondzell <i>et al.</i> , 2006	boulders, cobbles, gravels and finer textured sediment	9.2 m day ⁻¹	steep channels	wood debris	/	/	/	/	unconstrained	/	/	USA; Oregon Andrews Experimental Forest; humid-semiarid biogeographic region	bedrock outcrops	/	/
Wroblicky <i>et al.</i> , 1998	poorly sorted, gravelly, coarse sand with occasional cobbles and boulders.	see Table 2 for hydraulic conductivities	/	/	/	/	/	/	variable	/	/	USA; New Mexico; Aspen Creek, Rio Calavera; semiarid biogeographic region	Lower Permian fine sandstones and siltstones of the Meseta Blanca Member of the Lower Yeso Formation	/	/
Zarnetske <i>et al.</i> , 2011	sand, gravel, cobbles, and boulders.	/	planebed and riffles 0.007 m m ⁻¹ (reach slope)	/	/	/	/	/	/	/	/	USA; Oregon Drift Creek; humid-semiarid biogeographic region. Rainfall 1190 mm/yr	/	/	agriculture (lower catchment) forestry (upper catchment)

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