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Supplement of

Reviews and syntheses: Isotopic approaches to quantify root water uptake: a review and comparison of methods

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nb	Authors (Year)	Journal	S-single, D-dual, and DS-double single isotope framework	Natural isotopic abundance /labeling study	Plant cover type	Soil information	Method class	Details on the method
1	White et al. (1985)	Geochimica et Cosmochimica Acta	S	Natural	Trees	None	2	Linear mixing model function of time
2	Ehleringer et al. (1991)	Oecologia	S	Natural	Grasses and shrubs	None	1	None
3	Walker and Richardson (1991)	Chemical Geology	DS	Natural	Crops and trees	None	1	Direct inference (Brunel et al., 1995)
3	Walker and Richardson (1991)	Oecologia	S	Natural	Grasses and shrubs	None	1	None
4	Dawson and Ehleringer (1991)	Nature	S	Natural	Trees	None	2	None
5	Flanagan et al. (1992)	Plant, Cell and Environment	S	Natural	Shrubs and trees	None	1	None
6	Busch et al. (1992)	Ecological Applications	S	Natural	Shrubs and trees	None	1	Direct inference (Brunel et al., 1995)
7	Dawson and Ehleringer (1993)	Geochimica et Cosmochimica Acta	S	Natural	Trees	None	1	None
8	Thorburn and Walker (1994)	Oecologia	DS	Natural	Trees	None	1	None
9	Lin and Sternberg (1994)	Bulletin of Marine Science	S	Natural	Trees	None	1	Direct inference (Brunel et al., 1995)
10	Phillips and Ehleringer (1995)	Trees-Structure and Function	DS	Natural	Trees	Texture	1	None
11	Brunel et al. (1995)	Journal of Hydrology	D	Natural	Trees	Structure	1	Direct inference (Brunel et al., 1995)
12	Leroux et al. (1995)	Oecologia	S	Natural	Grasses and shrubs	Texture	1	Direct inference (Brunel et al., 1995)
13	Thorburn and Ehleringer (1995)	Plant and Soil	S	Natural	Trees	None	1	Direct inference (Brunel et al., 1995)
14	Komor and Magner (1996)	Water Resources Research	S	Natural	Trees	Texture	1	None
15	Dawson and Pate (1996)	Oecologia	S	Natural	Shrubs and trees	Texture	2	None
16	Emerman and Dawson (1997)	Plant and Soil	S	Labeling	Crops	Artificial soil	1	None
17	Bleby et al. (1997)	Plant, Cell and Environment	S	Natural	Grasses	Structure	1	Direct inference (Brunel et al., 1995)
18	Brunel et al. (1997)	Journal of Hydrology	S	Natural	Shrubs	Texture	1	Direct inference (Brunel et al., 1995)
19	Weltzin and McPherson (1997)	Oecologia	D	Natural	Trees	Classification	1	Direct inference (Brunel et al., 1995)
20	Dodd et al. (1998)	Oecologia	S	Natural	Grasses	Texture and classification	1	None
21	Le Roux and Bariac (1998)	Oecologia	S	Natural	Grasses and shrubs	Formation	1	None
22	Midwood et al. (1998)	Plant and Soil	DS	Natural	Shrubs and trees	Texture	1	Direct inference (Brunel et al., 1995)
23	Ewe et al. (1999)	Forest Ecology and Management	DS	Natural	Trees	None	1	None
24	Roupsard et al. (1999)	Functional Ecology	S	Natural	Trees	Texture, structure, and particle size distribution	1	None
25	Cramer et al. (1999)	Agricultural Water Management	DS	Natural	Trees	None	1	Direct inference (Brunel et al., 1995)
26	Meinzer et al. (1999)	Oecologia	S	Natural	Trees	None	1	Direct inference (Brunel et al., 1995)
27	Alstad et al. (1999)	Oecologia	S	Natural	Trees	None	2	None
28	Pate and Dawson (1999)	Agroforestry Systems	S	Natural	Trees	None	2	None
29	Plamboeck et al. (1999)	Oecologia	D	Labeling	Trees	Classification	3	4-end mixing model with three tracers: $\delta^{18}\text{O}$ Natural + $\delta^2\text{H}$ labelled + $\delta^3\text{H}$
30	Zhang et al. (1999)	Agricultural Water Management	S	Natural	Grasses	Particle size distribution	4	WAVES
31	Zubrinich et al. (2000)	Tree Physiology	DS	Natural	Trees	None	1	None
32	Moreira et al. (2000)	Plant and Soil	S	Labeling	Grasses and shrubs	Classification	1	Direct inference (Brunel et al., 1995)
33	Stratton et al. (2000)	Oecologia	S	Natural	Trees	Texture and classification	1	Direct inference (Brunel et al., 1995)
34	Williams and Ehleringer (2000)	Ecological Monographs	S	Natural	Trees	Texture	2	None
34	Williams and Ehleringer (2000)	Ecological Monographs	S	Labeling	Trees	Texture	2	None
35	Grieu et al. (2001)	Plant and Soil	S	Labeling	Grasses	Artificial soil	1	Direct inference (Brunel et al., 1995)
36	Retzlaff et al. (2001)	Trees-Structure and Function	S	Natural	Trees	Texture	2	None
37	Sekiya and Yano (2002)	Field Crops Research	S	Natural	Crops	Texture and chemical properties	1	None
38	Schwinning et al. (2002)	Oecologia	S	Labeling	Grasses and shrubs	None	1	Direct inference (Brunel et al., 1995)
39	Sternberg et al. (2002)	Plant and Soil	S	Labeling	Trees	Classification	1	Direct inference (Brunel et al., 1995)
40	Ewe and Sternberg (2002)	Oecologia	S	Natural	Trees	Classification	2	None
41	Zencich et al. (2002)	Oecologia	D	Natural	Trees	Classification (non FAO)	3	3-end mixing model $\delta^{18}\text{O}$ and $\delta^2\text{H}$ are uncorrelated
42	Martin-Gomez et al. (2015)	Environmental and Experimental Botany	S	Labeling	Trees	None	1	None
43	Angert et al. (2003).	Oecologia	S	Natural	Shrubs and trees	Classification	1	Direct inference (Brunel et al., 1995)
44	Snyder and Williams (2003)	Functional Ecology	S	Labeling	Trees	None	2	None
45	February et al. (2004)	South African Journal of Science	S	Natural	Grasses	None	1	None
46	Zegada-Lizarazu and Iijima (2004)	Plant Production Science	S	Labeling	Crops	Texture	1	None
47	Chimner and Cooper (2004)	Plant and Soil	S	Natural	Shrubs	Texture	1	Direct inference (Brunel et al., 1995)
48	Sekiya and Yano (2004)	Field Crops Research	S	Labeling	Crops	Texture	1	Direct inference (Brunel et al., 1995)
49	Ogle et al. (2004)	Ecology	D	Natural	Shrubs	None	4	Biophysical model of Campbell (1991)
50	Andrade et al. (2005)	Trees-Structure and Function	S	Natural	Trees	None	1	None
51	Iijima et al. (2005).	Plant Production Science	S	Labeling	Crops	Texture	1	None
52	Araki and Iijima (2005)	Plant and Soil	S	Labeling	Crops	Texture and physical properties	2	None
53	Zegada-Lizarazu and Iijima (2005)	Plant Production Science	S	Labeling	Crops	Texture	2	None
54	Boujamlaoui et al. (2005)	Comptes Rendus Geoscience	DS	Natural	Crops	Formation	4	Mass balance with consideration of root masses per

55	Fritzsche et al. (2006)	Tree Physiology	S	Natural	Trees	Classification	1	horizon
56	Greaver and Sternberg (2006)	Ecology	S	Natural	None	Texture	1	None
57	Holland et al. (2006)	Australian Journal of Botany	S	Natural	Trees	None	1	None
58	Zegada-Lizarazu et al. (2006)	Plant Production Science	S	Labeling	Crops	Texture	1	None
59	Kulmatiski et al. (2006)	Plant and Soil	DS	Natural	Grasses	Texture	1	Direct inference (Brunel et al., 1995)
60	Iijima et al. (2007)	Plant Production Science	S	Labeling	Crops	Physical properties	1	None
61	McCole and Stern (2007)	Journal of Hydrology	DS	Natural	Trees	Classification	1	None
61	McCole and Stern (2007)	Journal of Hydrology	S	Natural	Trees	Structure	2	None
62	Zegada-Lizarazu et al. (2007)	Plant Production Science	S	Natural	Crops	Texture	1	None
63	Asbjornsen et al. (2007)	Agriculture, Ecosystems and Environment	S	Natural	Grasses, crops, and trees	Texture and classification	1	Direct inference (Brunel et al., 1995)
63	Asbjornsen et al. (2007)	Agriculture, Ecosystems and Environment	S	Natural	Grasses, crops, and trees	Texture and classification	3	IsoSource (Phillips and Gregg, 2003)
64	Li et al. (2007)	Journal of Hydrology	DS	Natural	Trees	Classification	1	Direct inference (Brunel et al., 1995)
65	Snyder and Williams (2007)	Forest Ecology and Management	S	Labeling	Trees	Texture	2	None
66	Nippert and Knapp (2007)	Oecologia	S	Natural	Grasses	Texture	3	IsoSource (Phillips and Gregg, 2003)
67	Querejeta et al. (2007)	Oecologia	D	Natural	Trees	Classification	3	IsoSource (Phillips and Gregg, 2003)
68	Lambs et al. (2008)	Rapid Communications in Mass Spectrometry	DS	Natural	Trees	None	1	None
69	Schwinning (2008)	Oecologia	DS	Natural	Trees	Classification	1	None
70	Asbjornsen et al. (2008)	Plant and Soil	S	Natural	Grasses, shrubs, and trees	Texture and classification	1	Direct inference (Brunel et al., 1995)
71	(Costelloe et al., 2008)	Oecologia	S	Natural	Trees	None	1	Direct inference (Brunel et al., 1995)
72	Sánchez-Perez et al. (2008)	Hydrological Processes	S	Natural	Trees	Particle size distribution and physical properties	1	Direct inference (Brunel et al., 1995)
73	Fernandez et al. (2008)	Agroforestry Systems	S	Natural	Grasses and trees	None	2	None
74	Rowland et al. (2008)	Transactions of the ASABE	S	Labeling	Crops	Texture and classification	2	None
75	Izumi et al. (2009)	Plant Production Science	S	Labeling	Crops	None	1	Direct inference (Brunel et al., 1995)
76	Saha et al. (2009)	Ecohydrology	S	Natural	Trees	None	2	None
77	Eggemeyer et al. (2009)	Tree Physiology	D	Natural	Trees	Classification	3	IsoSource (Phillips and Gregg, 2003)
78	Saha et al. (2010)	Wetlands Ecology and Management	DS	Natural	Trees	Formation	1	None
79	Armas et al. (2010).	Oecologia	DS	Natural	Shrubs	Texture	1	Direct inference (Brunel et al., 1995)
80	Wang et al. (2010)	Agricultural Water Management	DS	Natural	Crops	Texture	1	Direct inference (Brunel et al., 1995)
80	Wang et al. (2010)	Agricultural Water Management	D	Natural	Crops	Texture	3	IsoSource (Phillips and Gregg, 2003)
81	Liu et al. (2010)	Agricultural and Forest Meteorology	S	Natural	Trees	Classification	2	None
82	Feikema et al. (2010)	Plant and Soil	D	Natural	Trees	Texture	2	Thorburn (1993) - 2D mixing model
83	Kulmatiski et al. (2010)	New Phytologist	S	Labeling	Trees	Texture	3	Proportional ² H uptake
84	Kowaljow and Fernandez (2011)	Journal of Arid Environments	S	Labeling	Shrubs	Texture	2	None
85	Sun et al. (2011)	Tree Physiology	S	Natural	Trees	Classification	2	None
86	Xu et al. (2011)	Ecohydrology	S	Natural	Trees	None	2	None
87	Yang et al. (2011)	Plant and Soil	S	Natural	Grasses	Particle size distribution	2	None
88	Drake et al. (2011)	Tree Physiology	S	Natural	Trees	Texture	3	None
89	Liu et al. (2011)	European Journal of Soil Biology	D	Natural	Trees	None	3	IsoSource (Phillips and Gregg, 2003)
90	Zhang et al. (2011)	Journal of Hydrology	D	Natural	Crops	Texture	3	IsoSource (Phillips and Gregg, 2003)
91	Jia et al. (2012)	PLoS ONE	DS	Natural	Shrubs	Texture	1	Direct inference (Brunel et al., 1995)
92	Moreno-Gutierrez et al. (2012)	New Phytologist	S	Natural	Grasses and shrubs	Classification	1	Direct inference (Brunel et al., 1995)
93	Nie et al. (2012)	Journal of Hydrology	S	Natural	Shrubs and trees	Texture	1	Direct inference (Brunel et al., 1995)
94	Bijoor et al. (2012)	Urban Ecosystem	D	Natural	Trees	Urban soils	2	Thorburn (1993) - 2D mixing model
95	Bertrand et al. (2012)	Ecohydrology	D	Natural	Trees	Classification	3	IsoSource (Phillips and Gregg, 2003)
96	Meissner et al. (2012)	Biogeosciences	S	Natural	Trees	Texture and bulk density	3	IsoSource (Phillips and Gregg, 2003)
97	Nie et al. (2012)	Journal of Hydrology	S	Natural	Shrubs and trees	Texture	3	IsoSource (Phillips and Gregg, 2003)
98	Rossatto et al. (2012)	Environmental and Experimental Botany	D	Natural	Shrubs	Classification	3	IsoSource (Phillips and Gregg, 2003)
99	Rothfuss et al. (2012)	Journal of Hydrology	S	Natural	Grasses	Particle size distribution and physical properties	4	SiSPAT-Isotopes
100	Stumpp et al. (2012)	Vadose Zone Journal	S	Natural	Grasses	Texture	4	HYDRUS-1D
101	Stumpp et al. (2012)	Hydrology and Earth System Sciences	D	Natural	Grasses	Particle size distribution	4	HYDRUS-1D
102	February et al. (2013)	Plant Ecology	DS	Natural	Shrubs	Classification	1	Direct inference (Brunel et al., 1995)
103	Hu et al. (2013)	PLoS ONE	S	Natural	Grasses and shrubs	None	1	Direct inference (Brunel et al., 1995)
104	Kerhoulas et al. (2013)	Forest Ecology and Management	S	Natural	Trees	Classification	1	Direct inference (Brunel et al., 1995)
105	Singer et al. (2013)	Ecohydrology	S	Natural	Trees	Classification	1	Direct inference (Brunel et al., 1995)
106	Stahl et al. (2013)	Oecologia	D	Labeling	Trees	Classification	1	Direct inference (Brunel et al., 1995)
106	Stahl et al. (2013)	Oecologia	D	Labeling	Trees	Classification	1	Romero-Saltos et al. (2005)

107	Wei et al. (2013)	Trees-Structure and Function	S	Natural	Trees	Classification	1	Direct inference (Brunel et al., 1995)
108	Estrada-Medina et al. (2013)	Trees-Structure and Function	D	Natural	Trees	Classification and clay content	3	IsoSource (Phillips and Gregg, 2003)
109	Jia et al. (2013)	Forestry Chronicle	D	Natural	Trees	Texture	3	IsoSource (Phillips and Gregg, 2003)
110	Wang et al. (2013)	Environmental Earth Sciences	S	Natural	Grasses and shrubs	Texture	3	IsoSource (Phillips and Gregg, 2003)
111	Leng et al. (2013)	Journal of Vegetation Science	D	Natural	Trees	Texture and classification	3	MixSir (Moore and Semmens, 2008)
112	Rossatto et al. (2013)	Plant Biology	S	Natural	Shrubs	Classification	3	Romero-Saltos et al. (2005)
113	Esquivias et al. (2014)	Ecohydrology	DS	Natural	Shrubs	Texture	1	None
114	Isaac et al. (2014)	Agriculture, Ecosystems and Environment	S	Natural	Crops and trees	Texture	1	Direct inference (Brunel et al., 1995)
115	Berry et al. (2014)	Oecologia	D	Natural	Trees	None	3	IsoSource (Phillips and Gregg, 2003)
116	Hoekstra et al. (2014)	Biogeosciences	S	Natural	Grasses	Clay content	3	IsoSource (Phillips and Gregg, 2003)
117	Liu et al. (2014)	Ecohydrology	D	Natural	Trees	Classification	3	IsoSource (Phillips and Gregg, 2003)
118	Zhu et al. (2014)	Journal of Plant Interactions	S	Natural	Shrubs	None	3	IsoSource (Phillips and Gregg, 2003)
119	Grossiord et al. (2014)	Journal of Hydrology	S	Labeling	Trees	None	3	Romero-Saltos et al. (2005)
120	Ogle et al. (2014)	Ecological Applications	D	Natural	Shrubs	None	4	Biophysical model of Campbell (1991)
121	Comas et al. (2015)	Forest Systems	DS	Natural	Trees	Classification	1	None
122	Bachmann et al. (2015)	PLoS ONE	DS	Labeling	Grasses	Classification	1	Direct inference (Brunel et al., 1995)
123	Holdo and Nippert (2015)	Ecology	DS	Natural	Grasses and trees	Texture	1	Direct inference (Brunel et al., 1995)
124	Goebel et al. (2015)	Agricultural Water Management	S	Natural	Crops	Classification	2	None
125	Hill et al. (2015)	Oecologia	S	Natural	Grasses	None	2	None
126	Schwendenmann et al. (2015)	Ecohydrology	S	Natural	Trees	Classification and formation	2	SISUS
127	Huang and Zhang (2015)	Water	D	Natural	Shrubs	None	3	IsoSource (Phillips and Gregg, 2003)
128	Prechsl et al. (2015)	Oecologia	S	Natural	Grasses	Classification	3	SIAR (Parnell et al., 2010)
129	Dai et al. (2015)	Plant and Soil	S	Natural	Grasses and shrubs	Texture	3	IsoSource (Phillips and Gregg, 2003)
130	Deng et al. (2015)	Environmental Earth Sciences	D	Natural	Trees	Structure	3	IsoSource (Phillips and Gregg, 2003)
131	Ellsworth and Sternberg (2015)	Ecohydrology	D	Natural	Trees	Texture	3	IsoSource (Phillips and Gregg, 2003)
132	Gu et al. (2015)	Environmental Earth Sciences	D	Natural	Trees	None	3	IsoSource (Phillips and Gregg, 2003)
133	Link et al. (2015)	Agroforestry Systems	S	Natural	Trees	Texture and classification	3	IsoSource (Phillips and Gregg, 2003)
134	Yin et al. (2015)	Journal of Hydrology	S	Natural	Trees	Texture and bulk density	3	IsoSource (Phillips and Gregg, 2003)
135	Barbeta et al. (2015)	Global Change Biology	D	Natural	Trees	Classification	3	SIAR (Parnell et al., 2010)
136	Santini et al. (2015)	Hydrobiologia	S	Natural	Trees	None	3	SIAR (Parnell et al., 2010)
137	Voltas Voltas et al. (2015)et al.	New Phytologist	D	Natural	Trees	Classification	3	SIAR (Parnell et al., 2010)
138	Yang et al. (2015)	Agricultural and Forest Meteorology	D	Natural	Trees	Texture	3	MixSir (Moore and Semmens, 2008)
139	Yang et al. (2015)	Scientific Reports	S	Natural	Crops	Texture	3	MixSir (Moore and Semmens, 2008)
140	Warren et al. (2015)	Journal of Arid Land	S	Labeling	Shrubs	Classification	3	Proportional ² H uptake
141	Beyer et al. (2016)	Journal of Hydrology	S	Labeling	Shrubs and trees	Physical properties	1	None
142	del Castillo et al. (2016)	Forest Ecology and Management	DS	Natural	Trees	Classification	1	None
143	Priyadarshini et al. (2016)	Ecohydrology	S	Labeling	Grasses and trees	None	1	None
144	Gaines et al. (2016)	Tree Physiology	D	Natural	Trees	Texture	2	Thorburn (1993) - 2D mixing model
145	Zhao et al. (2016)	Catena	D	Natural	Crops	Particle size distribution and physical properties	2	IsoSource (Phillips and Gregg, 2003)
146	Chen et al. (2016)	Environmental Science and Pollution Research	S	Natural	Shrubs and trees	Texture	3	IsoSource (Phillips and Gregg, 2003)
147	Guo et al. (2016)	Journal of Integrative Agriculture	D	Natural	Crops	None	3	IsoSource (Phillips and Gregg, 2003)
148	Zhu et al. (2016a)	Journal of Arid Land	D	Natural	Grasses	Texture	3	IsoSource (Phillips and Gregg, 2003)
149	Song et al. (2016)	Environmental and Experimental Botany	D	Natural	Trees	Texture	3	IsoSource (Phillips and Gregg, 2003)
149	Song et al. (2016)	Environmental and Experimental Botany	D	Natural	Trees	Texture	3	IsoSource (Phillips and Gregg, 2003)
150	Wu et al. (2016a)	Environmental Earth Sciences	S	Natural	Grasses	Texture	3	IsoSource (Phillips and Gregg, 2003)
151	Wu et al. (2016c)	Agricultural Water Management	D	Natural	Crops	Texture	3	IsoSource (Phillips and Gregg, 2003)
152	Zhu et al. (2016a)	Journal of Arid Land	S	Natural	Grasses	Texture	3	IsoSource (Phillips and Gregg, 2003)
153	Zhu et al. (2016b)	PLoS ONE	D	Natural	Shrubs	Texture	3	IsoSource (Phillips and Gregg, 2003)
154	Evaristo et al. (2016)	Hydrological Processes	D	Natural	Trees	Classification	3	SIAR (Parnell et al., 2010)
155	Muench et al. (2016)	Plant Ecology	D	Natural	Grasses and shrubs	Classification	3	SIAR (Parnell et al., 2010)
156	Volkman et al. (2016)	New Phytologist	S	Labeling	Trees	Texture and classification	3	SIAR (Parnell et al., 2010)
157	Wu et al. (2016b)	Journal of Applied Ecology	D	Natural	Crops and trees	None	3	SIAR (Parnell et al., 2010)
158	Ma and Song (2016)	Science of the Total Environment	D	Natural	Crops	Texture	3	MixSIAR (Moore and Semmens, 2008)
159	Trogisch et al. (2016)	Forest Ecology and Management	S	Labeling	Trees	None	2	Proportional ² H uptake

Table 1. Litterature overview obtained by entering the search terms ("root water uptake" or ("water source" and root) or "water uptake") and isotop*) into the ISI Web of Science search engine (webofknowledge.com). Date of consultation was January 18th, 2017.

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