

Table S-3. Estimated mean annual groundwater recharge as a percentage of water input for baseline conditions in the East Mauna Kea aquifer sector of the Island of Hawai'i, compiled by land-cover type and precipitation amount (refer to USGS SIR 2011–5078).

[<, less than; –, not applicable; water input is defined as the sum of mean annual rainfall, fog, and irrigation; baseline conditions are defined as 2008 land cover and mean annual rainfall for the period 1916–83; the East Mauna Kea aquifer sector consists of the Honoka'a, Pa'auilo, Hakalau, and Onomea aquifer systems and is defined by the Hawai'i Commission on Water Resource Management (see http://www.state.hi.us/dlnr/cwrm/mapsillustrations/gwhu_hawaii.pdf); reported mean recharge is an area-weighted average; no distinction is made between fog and non-fog conditions for shrubland, coffee, and eucalyptus forest plantations]

Land-cover description	Mean annual rainfall plus fog equal to 40 inches or less			Mean annual rainfall plus fog greater than 40 inches and less than 80 inches			Mean annual rainfall plus fog equal to 80 inches or greater		
	Number of water-budget subareas	Area (square miles)	Mean recharge as a percentage of water input ¹	Number of water-budget subareas	Area (square miles)	Mean recharge as a percentage of water input ¹	Number of water-budget subareas	Area (square miles)	Mean recharge as a percentage of water input ¹
Open native forest (outside fog zone)	0	–	–	1,869	2.84	3.8	10,058	18.25	9.2
Closed native forest (outside fog zone)	0	–	–	679	0.64	2.8	5,890	32.70	6.2
Alien and mixed forest (outside fog zone)	36	0.04	0.7	1,745	2.27	0.2	13,163	36.81	1.3
Open native forest (inside fog zone)	122	0.90	4.9	1,647	5.01	25.4	4,624	42.89	35.5
Closed native forest (inside fog zone)	6	0.01	9.8	188	0.30	23.0	3,997	100.40	37.1
Alien and mixed forest (inside fog zone)	72	0.29	2.7	772	3.75	4.6	877	5.05	15.0
Shrubland	816	8.36	36.4	2,218	14.50	51.5	3,540	9.64	45.4
Agriculture: Macadamia	0	–	–	19	0.06	14.2	1,645	5.97	32.0
Coffee	0	–	–	0	–	–	0	–	–
Diversified	0	–	–	35	0.01	42.3	12,547	35.50	29.2
Forest (eucalyptus)	0	–	–	0	–	–	480	1.61	19.2
Fallow/Grassland	0	–	–	0	–	–	2,887	8.51	28.2
Golf course	0	–	–	54	0.11	51.3	24	0.19	55.9
Low-intensity developed	1	<0.005	18.3	858	0.85	34.5	4,823	2.80	31.7
High-intensity developed	10	<0.005	73.9	357	0.21	53.6	3,809	1.20	43.4
Grassland	1,505	46.38	8.3	6,331	98.26	28.9	16,392	68.85	39.8
Sparsely vegetated	1,054	39.36	30.9	901	2.98	48.7	3,382	4.33	30.9
Wetland vegetation	0	–	–	0	–	–	0	–	–
Water body ²	2	0.01	–	48	0.08	–	30	0.07	–

¹Recharge as a percentage of water input was calculated for each subarea using the formula: $[(\text{recharge} - \text{direct recharge}) / (\text{rainfall} + \text{fog} + \text{irrigation})] \times 100$. Values for each subarea in a particular land-cover category were then multiplied by the area and summed, and that sum was then divided by the total area of that category to obtain a mean. Direct recharge is described in USGS SIR 2011–5078.

²Recharge was not calculated using the water-budget model (see USGS SIR 2011–5078, p. 28).