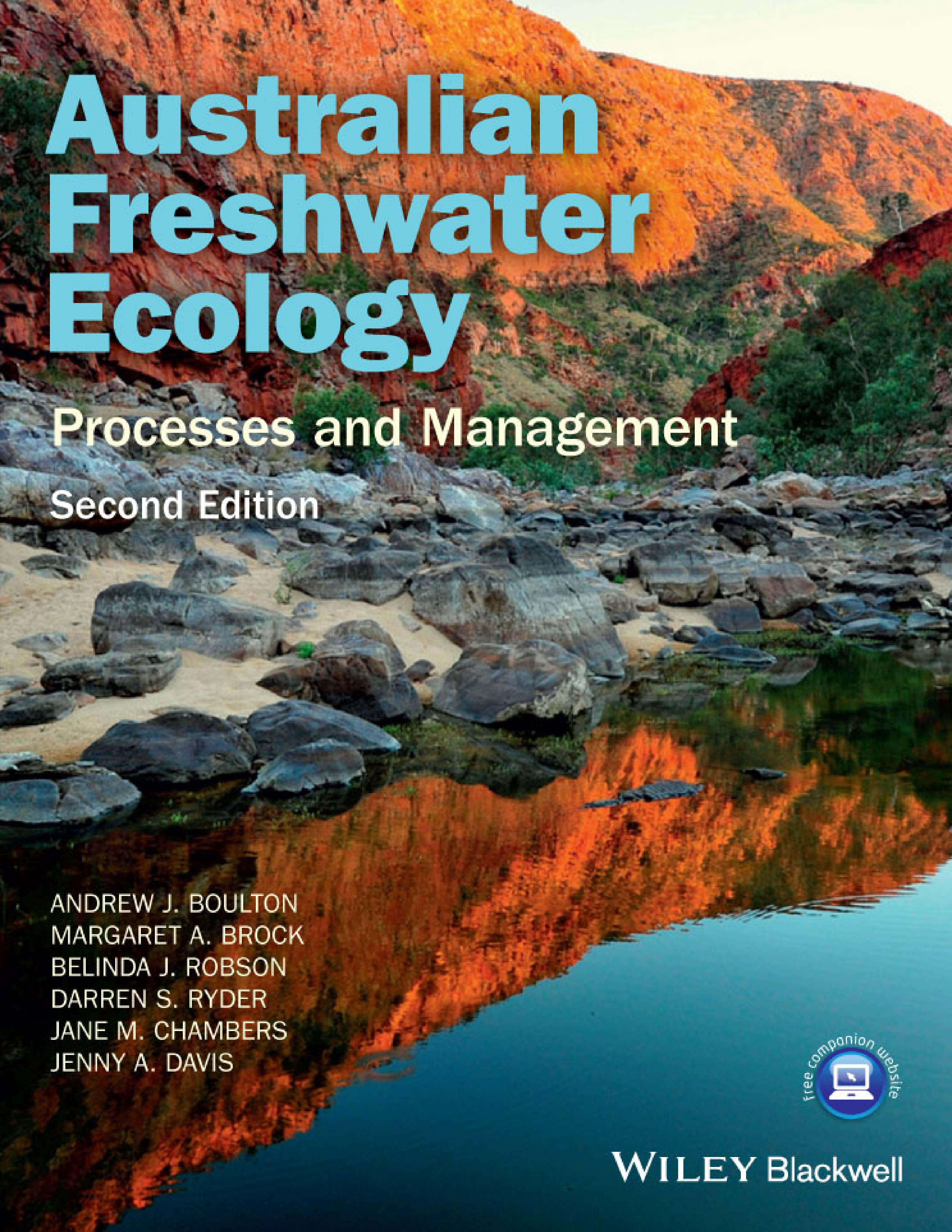

Australian Freshwater Ecology

Processes and Management

Second Edition

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estimate based on more recent models is presented in Trenberth *et al.* (2007). (Source: Smith 1998. Reproduced with permission of Oxford University Press Australia and New Zealand.)

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top of the sampling box; (c) a plankton net, with a sample-jar screwed to the apex, about to be cast out into the water and towed back to shore; (d) a stove-pipe sampler (the middle person is using a bilge pump to evacuate the contents of the sampling box (right) into a collecting net (left). (Source: (a) and (b) Darren Ryder, (c) and (d) Jenny Davis.)

Figure 4.4 The two major pathways by which energy flows (solid arrows) and organic material and nutrients cycle (broken lines and arrows) through standing waters: a heterotrophic detritus–decomposer–consumer food chain (left-hand side of figure) and an autotrophic producer–consumer food chain (right-hand side). All decomposers and consumers excrete nutrients and, when they die, decompose to become detritus (pathways not shown). (Source: Image drawn by Belinda Cale.)

Figure 4.5 Relative sizes of some lentic producers. Macroscopic plants include the filamentous green alga *Spirogyra* (A), floating plants such as duckweed *Landoltia punctata* (B), submerged plants such as *Myriophyllum* (C) and emergent plants like *Juncus* (D). Microscopic plants (with a close-up of *Spirogyra*: A) include phytoplankton such as the desmid *Micrasterias thomasiana* (E), dinoflagellates like *Peridinium* sp. (F), golden-brown algae (G), diatoms (H), and green unicellular algae (I). Many bacteria (represented as a small dot, J) are also producers. (Source: Adapted from Brock 1994 and reproduced with permission of Cambridge University Press. Images: *Landoltia punctata* – Mark Wapstra; algae – Joan Powling; emergent plant – Margaret Brock.)

Figure 4.6 Water regime plays a major role in governing the ecology of producers in aquatic

Figure 4.12 In the WA wheatbelt, shallow lakes of differing salinity exist in different states that are either dominated by submerged plants, by phytoplankton or by microbial mats. These lakes may occur close to each other yet have very different assemblages. (Source: Jenny Davis.)

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Figure 4.19 Trophic cascades can be considered as either 'top-down' where changes in the abundance of the top consumers (e.g. golden perch) cascade down the food chain to influence the abundance of lower trophic levels, or 'bottom-up' where changes in factors such as nutrients released from the sediments through bioturbation (i.e. biological disturbance by worms burrowing or fishes such as common carp feeding in the sediments, etc.) influence the abundance of producers and cascade up the food chain, ultimately affecting the abundance of top predators. (Source: Image drawn by Belinda Cale.)

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shrink, concentrations of ions increase through evaporation. (Source: Andrew Boulton.)

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Figure 7.9 Time to pray. The plate-like labium of this aeshnid dragonfly nymph unfolds forward to twice its length and the toothed mandibles at the end seize the prey. (Source: Gooderham and Tsyrlin 2002. Reproduced with permission of John Gooderham and Eddie Tsyrlin.)

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