



Boom goes the blue space: Transitions in surface water allocations in America's Boomburbs

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Boomburbs, or booming suburbs, represent rapid economic growth and urban sprawl but also reflect a substantial redistribution of blue space (surface waters). In this study, the addition, modification, and removal of stream channels and inland waters for 17 boomburbs, most located within the Sunbelt region of the U.S., were analyzed. Historic (pre-development) and present-day stream flowlines and inland lake / pond boundaries were digitized and edited off the first available USGS 1:24000 scale topographic maps and from the National Hydrography Dataset (NHD), respectively. Additionally, the count and distribution of residential pools provided data on the reallocation of surface water for several boomburbs. Except for one boomburb in California (Elk Grove), which had no significant loss or gain, stream loss was otherwise high, including more than 70% channel loss in both Nevada boomburbs (Henderson and North Las Vegas). Much of the channel loss was due to centralizing surface runoff through a few major channels and canals. Inland waters, in contrast, were typically added to the urban landscape. As an example, Chandler (AZ) had no noteworthy surface waters in 1955, but now has 1.545 square km of inland waters, mostly situated within residential communities and golf courses. Compounding the water allocation problem, Chandler had over 24,000 residential pools (approximately 1 for every 3 homes), which would be equivalent to an inland lake exceeding 1 square km. This study illustrates a common, but problematic, practice of simplifying the urban stream network in desert-like conditions, while adding excess water jigsawed into the urban landscape to support housing development and recreational purposes that usually offer limited ecosystem services. The results also suggest a disproportionate distribution of water based on socioeconomic status. These boomburbs are only a small fraction of sprawling metropolitan areas, but the overall demand for urban water in the Sunbelt region is extremely high and results in transbasin diversions, an abundance of dams and reservoirs, and groundwater depletion. Sustainable water management will need to focus more on reducing water reliance, rather than just water recycling, in order to prepare for the effects of a changing climate and continued shifts in development.