The Power of Language in Feedback Metaphors: A Response to Kennedy

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Kennedy (2012) makes an impassioned plea that urban metabolism (UM) research makes worthy contributions. Here we can agree: Material and energy flow accounting (MEFA) *is* a commendable activity. The merit of accounting for the resource consumption of cities—delineating their inflows and outflows—is not being questioned. Rather, precisely *because* it is a useful tool, it is important to understand what it does—and does not—offer to the interdisciplinary community of researchers and practitioners interested in understanding socio-ecological systems and finding sustainable solutions to global environmental change.

Where we part ways is the extent of its usefulness. The language chosen to convey ideas, and the science and theory underpinning them, *matter* for both the researchers engaged in the generation of knowledge and those who consume it. The way a community contextualizes its subject affects its investigations and interpretations (Larson 2011). Once adopted, such ideas have staying power, and allegiance to them can interfere with informed understanding. Kennedy illustrates this by dismissing the perceived small contribution natural components make to overall urban accounts. Certainly, the liberal and colloquial use of language has influenced ecology (Craigie 2001; Larson 2011). Indeed, it may be beneficial for ecologists to review the pros and cons of “ecosystem metabolism” and other metaphors within the discipline and across interdisciplinary endeavors. Kennedy argues that UM researchers already know how ecological theory and science differ from the ill-fitting comparisons imposed by the UM device. Some may; but others surely do not, as evidenced in the literature where, among other things, can be found the confusion between biological and ecological concepts as well as the use of *superorganism* (cf. Golubiewski 2012).

Importantly, it is not only UM researchers affected by the use of UM but also those outside the UM circle. In practice, this can lead some adherents to argue (vociferously) that they must present an organismal analogy when working with city planners and policy-makers because it makes the connections to the environment more real, and that the ecosystem argument would not be understood. Apparently (according to this logic), it is easier to conceive of a river cutting through the city as flowing blood (in the organismal city’s “circulatory system”) than it is to consider it a waterway with connections to the adjacent riparian vegetation and built environment as well as upland communities and the air above. But in this era of environmental awareness, people increasingly make connections and link the environment to the city. And in this era of global environmental change, people—especially environmental practitioners—most likely understand systems (and should be expected to). If an appropriate exposition of the urban ecosystem cannot be made, then there is little hope for the sustainable city.

To be sure, it is the urban research community’s remit to get the message across. Care with language is everyone’s responsibility. Literary devices are not always well thought-out and are created for a variety of reasons: to convey a new insight, to explain a difficult topic, or to gain attention. We should be willing to evaluate and review them, to use them as far as they are productive but to always recognize their limitations.

To bequeath the city organismic properties permits obscuring responsibility for and approaches to sustainability. The city is not a cognizant entity making decisions, consuming resources, and growing into the countryside of its own accord. The city is not doing anything to us; we create it. The composition and pace of resource use, as well as the form and size of the city, are the results of many

separate decisions and actions. Humans are not external to the urban system, but an integral part. So too the environment: it is not simply a “hinterland” providing resources; rather, the urban system needs to be understood in situ along with its imports and exports. Certainly, scale is an important issue as addressed in Golubiewski (2012); however, scale is not the same thing as levels of organization (e.g., Likens 1992).

In sum, the accounting process itself is a tool. But it does not provide the elusive link between ecology and economics, nor does it provide sustainability solutions. In this important respect, the UM model is not interdisciplinary even if a diverse group contributes to accounting. Something more is required. The needs for richer language and a more nuanced understanding have been recognized as pertinent to addressing the challenges faced by the urban global environmental change research community, which include the need to decompose the urban black box and to incorporate spatiality (Seto 2010).

It is precisely because material and energy flow accounting has a role to play—cataloging throughput—that we need to scrutinize the language, concepts, and theory underlying it.

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