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How scale matters in joint knowledge production for nature-based solutions. Dynamic proximity among stakeholders in climate adaptive water management for brook catchment Aa, the Netherlands

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The question 'how scale matters' from experienced policy makers in adaptive water management motivated us to explore the issue. In search for climate resilience of brook catchments stakeholders collaborate. Those collaborations involve dynamic proximity, giving rise to innovative, creative solutions using natural hydrological and landscape processes. Dynamic proximity is known from innovation research in the field of high-tech regional economic development. The question is whether dynamic proximity among stakeholders influences success of joint knowledge production (JKP) processes as well. We focus on a more nature-tech context of regional economic development: creating nature-based solutions (NbS) to support climate resilience. The conceptual model to study the creative process of JKP combines the four dimensions of JKP with four forms of dynamic proximity. Along this matrix quotes of stakeholders were analysed from seven semi-structured interviews. At least one stakeholder in the process for the brook-restoration of the Aa (the Netherlands) was selected from industry, academia, government and non-profit organizations (following the 'quadruple helix model'). Findings show that stakeholders who are versatile in using various forms of social, cognitive, institutional and geographical dynamic proximity in the process of JKP experience the process as more successful. Moreover, stakeholders overdoing the institutional or geographical aspects of proximity run into adverse effects, a mechanism recognized in economic geography as the proximity paradox. Furthermore, stakeholders are better supported when they use knowledge instruments, but only when keeping in mind the balance of forms of dynamic proximity. Findings were validated against two stakeholders' experiences in another process for the Aa of Weerijis (the Netherlands). We suggest refining the model by adding two forms of dynamic proximity relating to interests and to resources, enabling a sharper focus on knowledge production under the heading of cognitive proximity. So, scale matters in such rural, natural processes. The perspective on proximity helps innovation, if proximity among stakeholders does not become too proximate. We have summarised findings in the form of a proximity tool, which is useful for optimizing the science-policy interface in regional adaptive water management.

