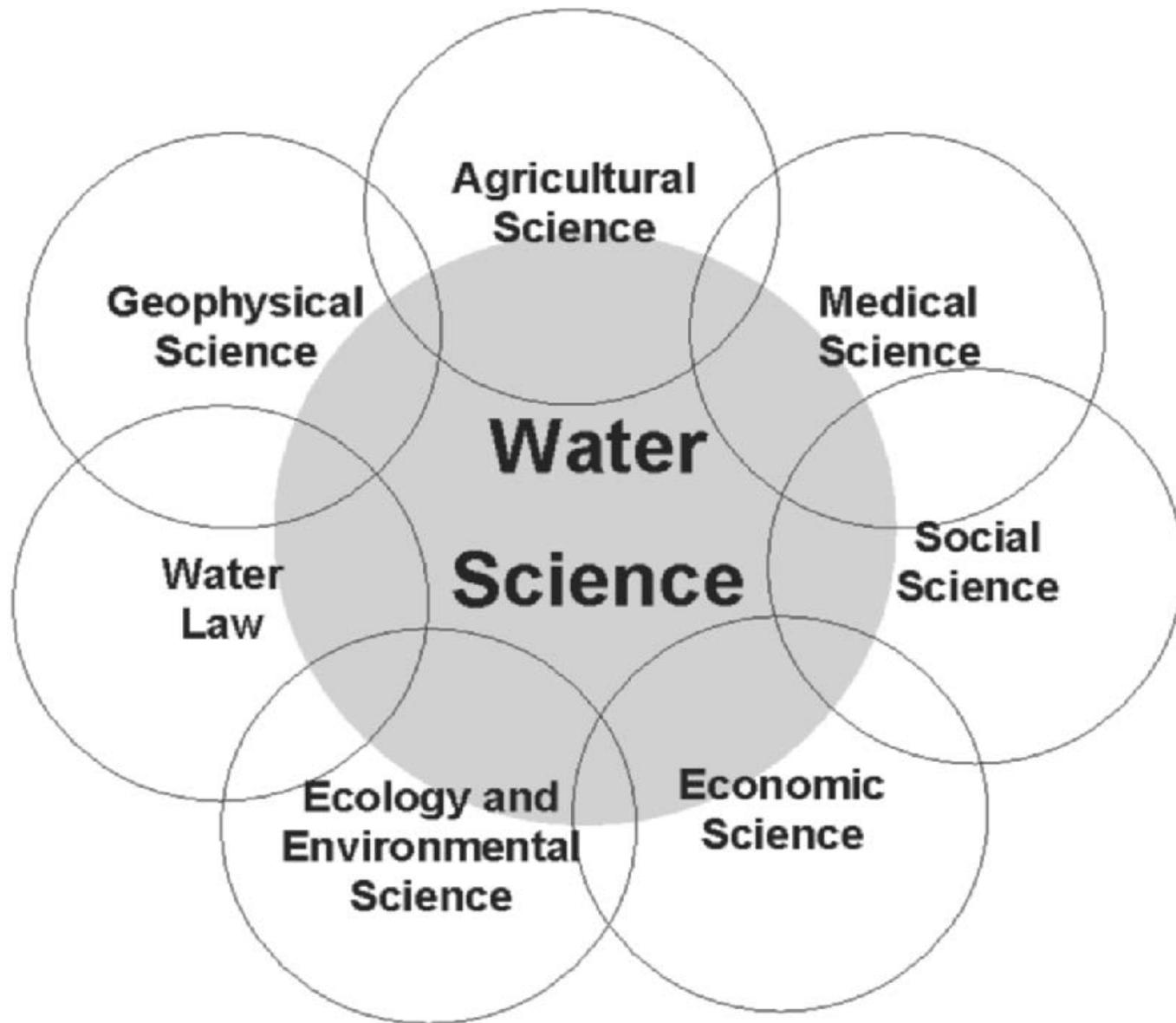


A Transdisciplinary Research Framework



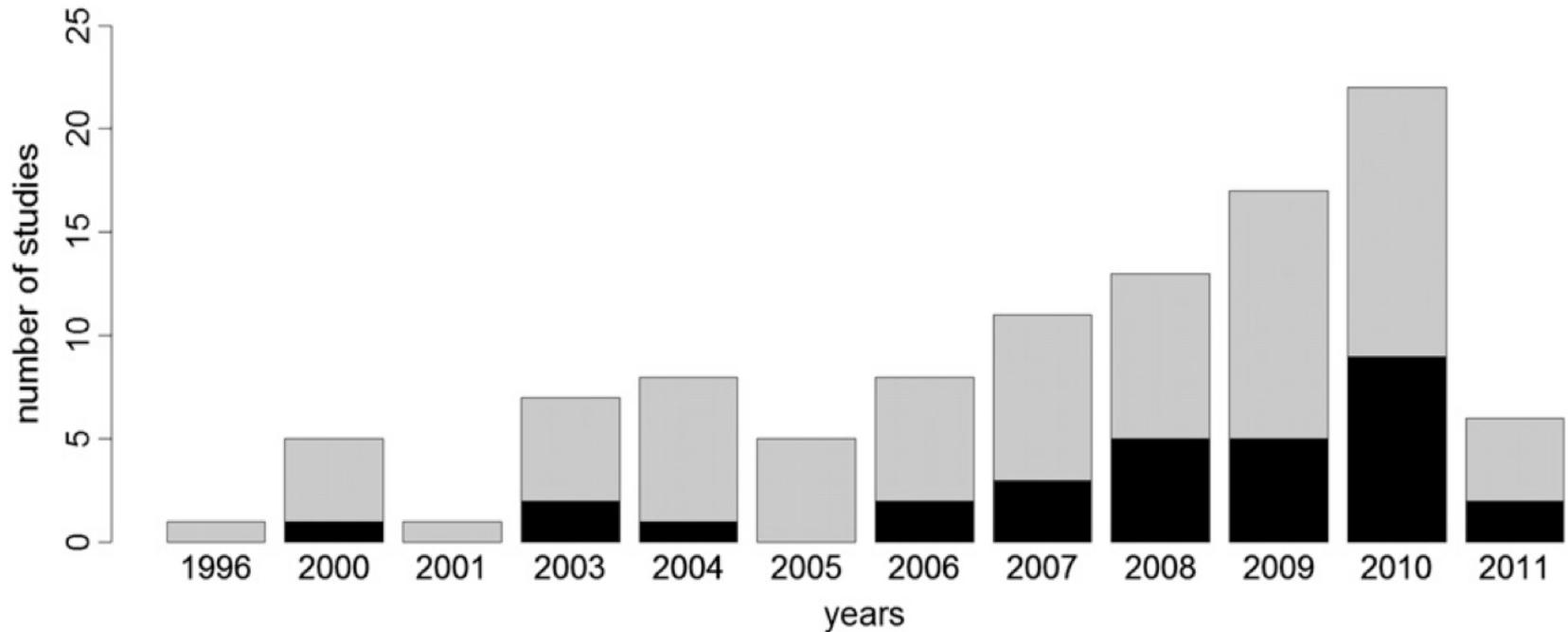


Malin Falkenmark. *Towards integrated catchment management: opening the paradigm locks between hydrology, ecology and policy-making*. (2004) *International Journal of Water Resources Development*, 20:3, 275-281.

Need for Transdisciplinary Approach

- The differentiation, specialization and fragmentation of science into disciplines over the last centuries have gone hand in hand with extraordinary progress both in the quantity and quality of knowledge produced. The accompanying self-dynamics of scientific progress with the division of labour and the emerging incentive systems strongly supported the trend for individual scientists or groups of scientists to invent their own languages, journals, career systems and curricula, and eventually to tailor their research questions according to their ability to cope with their own cultural, technological and/or organizational structures
- On the one hand disciplines are good at providing essential knowledge, methods and tools. On the other hand, disciplinary approaches tend not to have the capability to handle complex challenges (e.g. climate change, public health, food and water insecurity) that demand cross-disciplinary collaboration.

Transdisciplinary Studies published 1996 - mid 2011



Number of case studies employing transdisciplinary methods over time shown by grey bars. Black color indicates the proportion of studies that used the term “transdisciplinary”. Search was conducted **July 18, 2011**.

Steps for transdisciplinary research:

1. Collaboratively identify an actual problem creating or likely to result in significant conflict or harm.

“It was one of the most interesting and useful outcomes of this study, that team performance is not at all necessarily combined with a high degree of accordance amongst team members but that it rather seems closely connected to the consciousness of team heterogeneity and to a very open and down-to-earth analysis of divergences.

A most striking result of the monitoring study was the observation that a number of projects that had been merged by the programme management and that consequently passed through an extremely difficult start phase of team building performed very well in the end: these merged teams soon enjoyed and cultivated the very direct style of discussion they had developed during the hot kick-off periods of the projects, and they felt more satisfied with their scientific results than many of the other teams that had started off in harmony and that later had great difficulties to establish a culture of open confrontation of contradictory views—inevitably linked to temporary experiences of disunity and conflict.”



Steps for transdisciplinary research:

1. Collaboratively identify an actual problem creating or likely to create significant conflict or harm.
2. Create a methodological framework enabling the reintegration of knowledge.

Table 2 – Incentives and disincentives to collaborate according to professional culture.

Type of participant	Case study	No. of interviews	Incentives reported	Disincentives reported
Permanent academics	1,2,3,8,10	5	Interest in complex environmental problems Personal interest in influencing practice (once established as an academic) To win contracts for funding	Need for mono-disciplinary publications Partners may not aspire to same degree of rigour
Short-term contract academics (Post-docs, Research associates)	1,2,9	5	To address complex environmental problems Experience of working with environmental NGOs and other businesses. Access to funding	Progression to permanent job via academic publications within discipline Research not considered rigorous, due to (perceived) lack of control of variables
Environmental pressure groups/NGOs	2,3,4,6,7,8	5	To tackle environmental issues that are not within a single discipline Provide material for lobbying Dissemination to land users Access to funding	Environmental goals conflict with objectives of partners Responsibility to members Partners unwilling to release early results Academic results not available to users
Technology company (plant breeders, agrochemical companies)	3,5,6	5	Extend their capacity for research and development Obtain insights from customers Demonstrate support for customers Improve image and profile	Unwilling to share intellectual property Responsibility to shareholders Long timeframe for academic research
Commercial consultancy and research companies	3,4,5,6,7,8	10	Use their links to researchers, technology companies and land users to get funding Get resources to generate knowledge of use of their customers	Protection of intellectual property
Farmers and land managers	1,2,3,5,7,8,9	12	Knowledge generation that helps increase yield or improve land management Interdisciplinary approach mirrors their practice of balancing economic, environmental, social and technical perspectives	Formal trials and controlled variable experiments unlike actual practice Academic research not communicated to farmers Long time frames of academic research

“Transdisciplinary research is an approach. It should not seal itself off by trying to establish its own scientific glossary and procedures. Instead the approach should try to use as simple language as possible, shared by many disciplines and with results ultimately also understandable by civil society.”



Early development of Sun City, Arizona

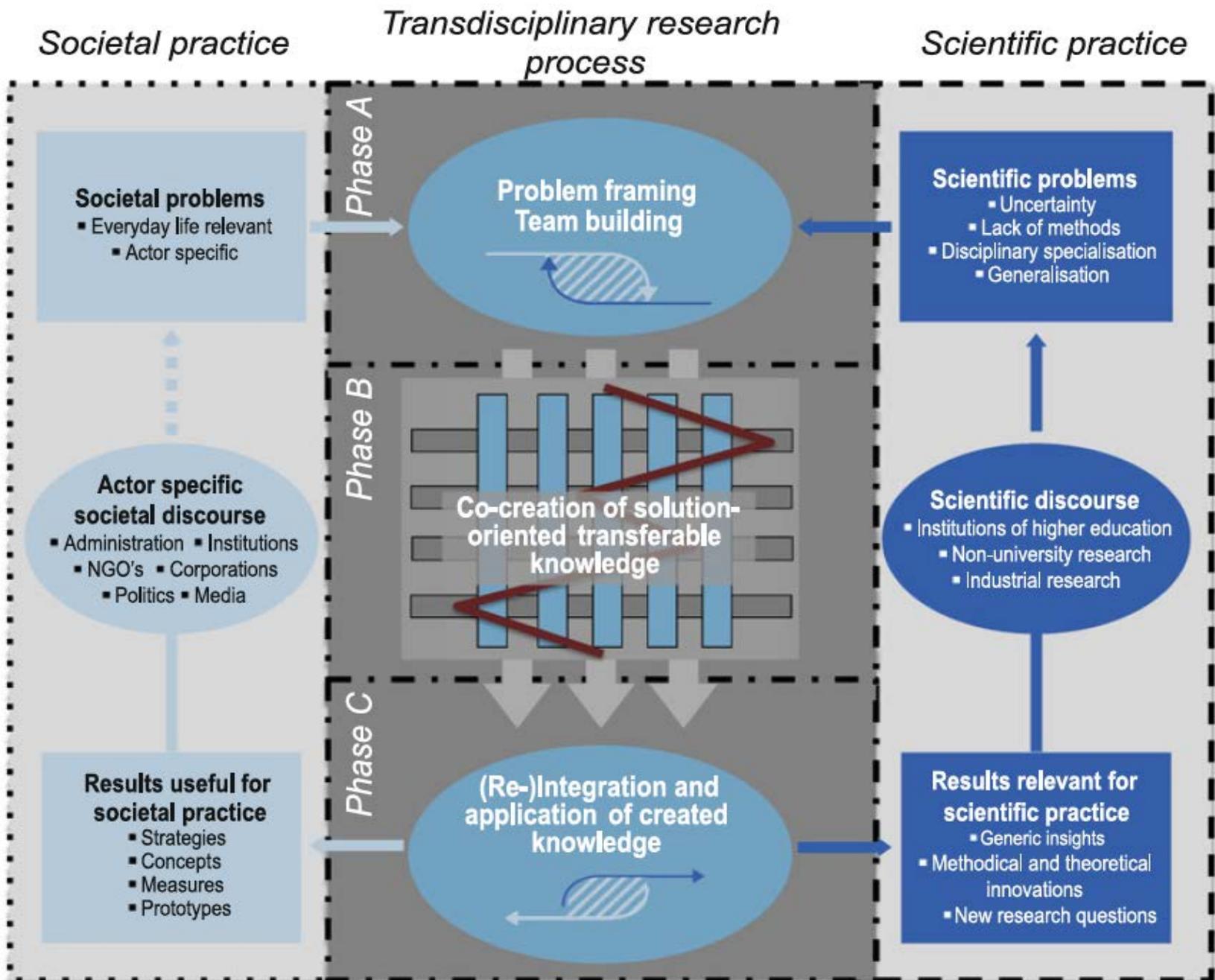
Steps for transdisciplinary research:

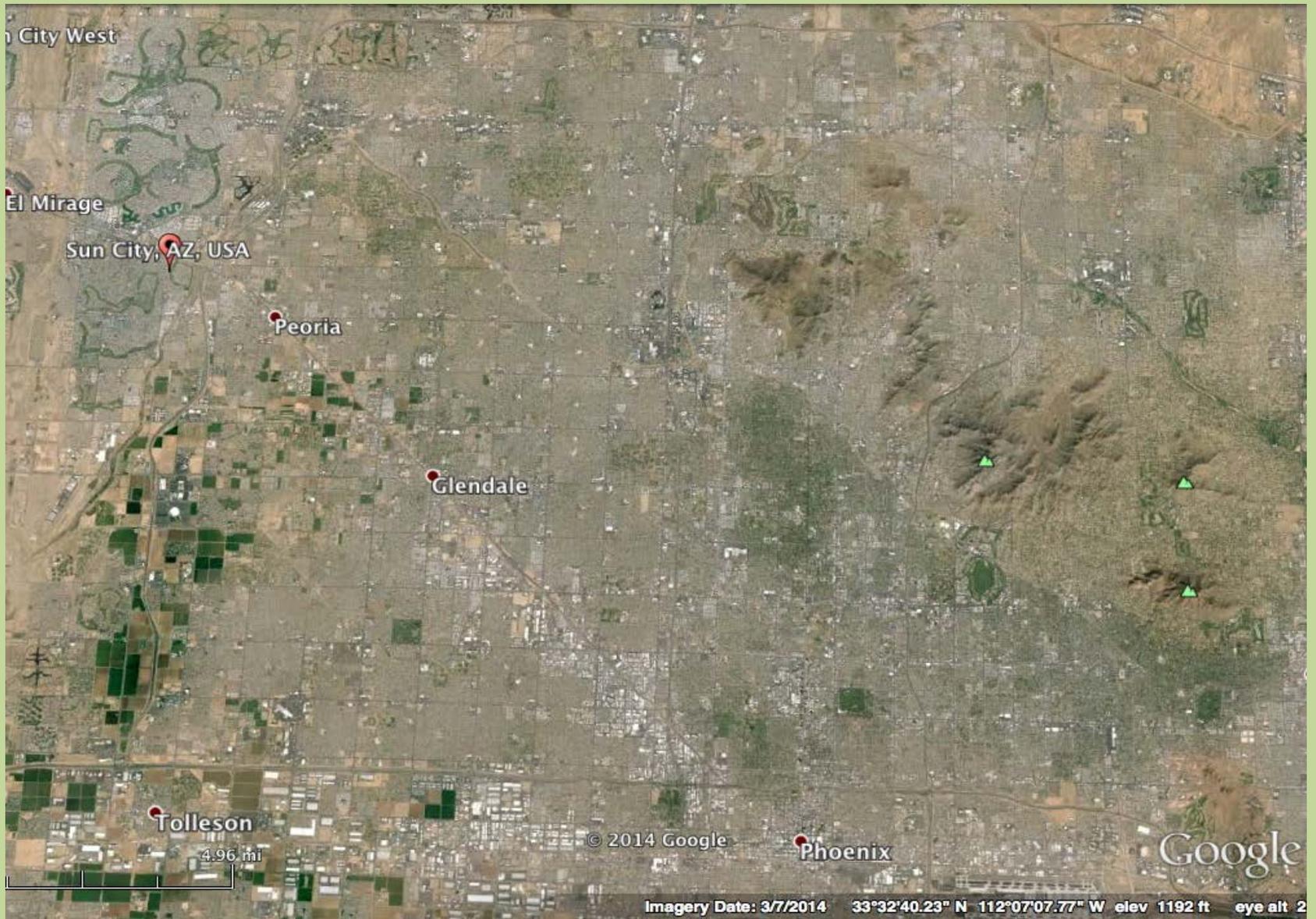
1. Collaboratively identify an actual problem creating or likely to create significant conflict or harm.
2. Create a methodological framework enabling the reintegration of knowledge.
3. Jointly create solution-oriented and transferable knowledge which requires integrating different knowledge bodies by collaboration among different disciplines as well as between researchers and real-world actors.

Lang, D.J., Wiek, A., Bergmann, M., Stauffacher, M., Martens, P., Moll, P., Swilling, M., Thomas, C.J., 2012. Transdisciplinary research in sustainability science: practice, principles, and challenges. *Sustainability Science* 7 (S1), 25–43.

Steps for transdisciplinary research:

1. Collaboratively identify an actual problem creating or likely to create significant conflict or harm.
2. Create a methodological framework enabling the reintegration of knowledge.
3. Jointly create solution-oriented and transferable knowledge which requires integrating different knowledge bodies by collaboration among different disciplines as well as between researchers and real-world actors.
4. Integrate and apply produced knowledge: (re-)integration of results into societal and scientific practice.





Current view of Sun City, surrounding towns and Phoenix
2013 population 37,500; average age is 73

Arizona Population Growth

