February 28, 2013

Community White Paper for Arctic Observing Summit
Vancouver, BC
30 April - 2 May, 2013

**Observing Adaptation Strategies of Arctic Communities to Climate Change:
A View from Applied Psychology**

Enrico J. Wensing PhD (1,2,3)

1) Visiting Scientist, Caribbean Green Technology Center, University of the Virgin Islands, St. Thomas, USVI (enrico.wensing@uvi.edu).
2) Associate Scientist, Saybrook University, San Francisco, CA
3) NSF funding OPP #1128004 (2011-2012) and pending.

Summary

The social indicators project of the Arctic Observation Network (AON-SIP) was concluded with the 2011 publication of a special issue in *Polar Geography* (Berman, 2011; Kruse et al., 2011). The AON-SIP sought to develop a system of social observations that could be utilized to compile and compare data that could be analyzed for its adequacy with regard to three objectives, namely: "observing changes in well-being of arctic residents, observing arctic changes relevant to global society, and understanding ongoing social change in the arctic" (Berman, 2011, p. 125). Berman utilized the indicators for well-being set-out in the Arctic Social Indicators Report (ASI) and the Study of Environmental Arctic Change (SEARCH) as frames of reference to begin to construct a model for social system observation.

As others have observed (c.f. Mills, van de Bunt, de Bruijn, 2006; Smelser, 2003), Berman recognized there are inherent challenges and limitations of cross-scale, cross-cultural, and cross-situational comparative analysis of research. He also noted, as others have, that climate change was not the only driver of social change in the Arctic. Nonetheless, Berman's work has provided an important baseline that other researchers can use to understand the human dimensions of Arctic change and stakeholders might use to adapt to those changes.

As detailed in this paper, I seek to expand upon the AON-SIP by conducting a comparative analysis of 1) the changes in action being taken within and between Arctic communities to improve well-being in a transition toward sustainability, in general, and toward adaptation to climate change, in particular, 2) how these Arctic adaptation strategies compare to other community strategies worldwide, 3) the extent to which these adaptations are being guided by and/or fulfilling the six domains of the Arctic Social Indicators Report, 4) which other social indicators might support Berman's social observation model, and 5) how networking and presentation of results might best disseminate the value of continuing the development of the AON-SIP to track human development in the Arctic over time.

1. Introduction

The objective of the Arctic Observing Network Social Indicators Project (AON-SIP) was to develop a system of social observations that can answer the question, 'Is the arctic system moving to a new state?' Berman (2011) showed that while data sets were available to evaluate certain areas, such as Alaska and Norway, in terms of the human dimensions of interaction with climate change and social indicators of well-being, issues of comparability of data and gaps in data accumulated in general limited their utility. To develop the Arctic social observation system, therefore, statistical agencies were encouraged to pursue internationally comparable data as well as to obtain essential new primary data.

This study, termed the Arctic Adaptation Strategies Project (AASP) will serve to build and broaden the base of an Arctic social observation system and seek to help accurately reflect the real-world interaction dynamics (human-environment and human-human) that are leading communities toward or away from sustainability and adaptation to climate change. The AASP will seek to build on Berman's Arctic social system model (Berman, 2011, p. 133) to further elucidate "...the most quantitatively important and most easily observed drivers that could affect observable social outcomes at a relatively short (annual to decadal) time scale. It represents key strategies people in the arctic use to adapt to environmental and other change..."

To achieve these objectives an observation and interview process of community researchers, stakeholders and community leaders for Arctic sustainability is proposed. The results of these observations and interviews will be analyzed for shared themes and then compared to the literature. Any thematic commonalities with the literature will be further investigated in a second series of observations and interviews to deepen the understanding of the changes occurring in Arctic social systems and the means by which to best adapt to them. Ultimately, this data will seek to help build models for community building and inform policy and program strategies toward best practices for adaptation.

2. A View from Applied Psychology

The dictionary of the American Psychological Association defines psychology as the disciplined inquiry into "the collection of behaviors, traits, attitudes and so forth that characterize an individual or group" (Van den Bos, 2007, p. 754). Behaviors, attitudes, and motivation; the subject and research domain of psychology, play an essential role in generating a sustainable future across global societies.

The role of psychology in a transition toward a sustainable global future has been recognized for some time. For instance, writing in the journal *American Psychologist* Marsella (1998) advocated for the development of a superordinate or meta-discipline of psychology termed "global community psychology" which, he defined as " a set of premises, methods, practices for psychology based in multicultural, multidisciplinary, multisectoral, and multinational foundations of global interest, scope, relevance, and applicability" (p.1282).

Applied psychology, as the name suggests, takes theory and research and seeks to apply it to solve practical problems of human experience; both individual and collective. For example, recent research in applied psychology has begun to further demonstrate the positive link between social identity, health, and well-being (Haslam, Jetten,

Postmes, & Haslam, 2008). While it has been around for a long time (see for example, Freyd, 1926), applied psychology has furcated over time to include, amongst others, the domains of organizational psychology, applied social psychology, and educational psychology. The research and practice of applied psychology can therefore help inform and guide the multiple social dimensions of a transition toward sustainability across cultures over the longer-term and adaptation to climate change in the immediate term.

The present study seeks to observe adaptation strategies of Arctic communities to climate change from an applied psychology perspective at both the individual and community level.

3. Community Adaptation Strategies in the Arctic

Research in mitigating and adapting to climate change, while taking a justified place at center stage, is but one dimension of the multitudinous wicked problem of sustainability (Parris & Kates, 2003; Miller, 2012). It is now well understood that a transition toward sustainability from the local to global level requires the coordination of collaboration and action within and between communities worldwide. To optimize efficacy, local and non-local experts, stakeholders, policy makers, and many others must form collaborative groups. In a very real sense these groups must, for optimal efficacy and just representation, be thought of and act as communities themselves. To this end, these groups may be called collaborative communities for sustainability (CCS). Participants in CCS are, ideally, both local and non-local experts and stakeholders that are connected through a larger network that links the global to the local. CCS are integral in sharing and building knowledge; for the effective translation, mediation, and dissemination of that knowledge and for building the salience, legitimacy, and credibility to encourage implementation at the local level (Cash et al., 2003).

There are no panacea "cure-all" type fixes to climate change adaptation or a transition toward sustainability; and those fixes that are successful are, typically, only temporary and often exclusively suited only to the community for which they are designed and implemented (Anderies et al., 2007; Meinzen-Dick, 2007).

Similarly, the Arctic has unique features with regard to human climate change adaptation and sustainability transitions. For instance, as Berman (2011, p. 131) described,

> In the Arctic, where agriculture and forestry are minor activities, social system links to the earth system are largely unidirectional through the cryosphere's effects on transportation modes and access, and through local and regional ecological variability and change (ACIA 2004). These biophysical effects on the human system are locally heterogeneous, and human occupation of the Arctic is discontinuous and sporadic across a large geographic space. Consequently, models of human activities aggregated to the level of states or nations link poorly to climate or earth system models. Linked climate-social models of one community or small region (Berman et al. 2004) cannot easily be scaled up. In the Arctic, a social system model to assist design of a broad-area, spatially detailed observing system is a pioneering endeavor.

Thus, the dynamics of CCS are best evolutionary. That is, a hermeneutic type of spiraling participatory process of inquiry (Emery & Flora, 2006; Safarzyńska, Frenken, & van den Bergh, 2012) in which participants share leadership (Laszlo, 2012). In a sense, these social processes are a form of biomimicry since ecosystems are evolving globally; but in particular at an accelerated rate in the Arctic.

As Berman (2011, p.126) noted, "Since the Arctic is constantly evolving, it is not obvious how one would define when the pattern of change has become a new state, and how would one measure that pattern of change?" Indicators of social change within a changing Arctic, while essential, have limitations (Turcu, 2012). Similarly, so-called critical success conditions or factors of collaborative methods (Walter & Scholz, 2007) and critical steps in the community implementation process (Meyers, Durlak, & Wandersman, 2012) are inherently "fluid."

Despite these challenges there has been a call for the development of community adaptation strategies. For instance, with regard to the threat climate change poses to public health worldwide there has been a call to identify, develop, and implement adaptations; and that these actions "must not be delayed by contrarians, nor by catastrophic fatalists who say it is all too late" (Costello et al., 2011, p.1866).

In the Arctic adaptation research remains in its early stages, largely considering vulnerability assessment and potential actions for adaptations (Ford et al., 2010; Pierce et al., 2012). As per Ford "early scholarship was dominated by work documenting Inuit observations of climate change, with research employing vulnerability concepts and terminology now common. Adaptation studies which seek to identify and evaluate opportunities to reduce vulnerability to climate change and take advantage of new opportunities remain in their infancy" (Ford, et al., 2012, p. 1) Therefore, the time is right, as this study seeks to do, to move toward comparative community research to characterize the best practices in terms of community dynamics and optimal community leadership behavior and attitudes for sustainability. This comparative research will serve to develop and implement valid and effective community based models for climate change adaptation and sustainability transitions across Arctic communities.

4. Community Leaders for Adaption in the Arctic

Not everyone believes in the ongoing and future deleterious effects of climate change, nor that something particularly can or should be done about it. Anthony Leiserowitz at Yale University has chronicled the disbelief surrounding climate change and has been able to categorize American's along a gradient of six degrees of perceived harm, cause, scientific agreement, and solvability (Leiserowitz et al., 2012)

Similarly, not everybody participates in community adaptation and yet, some do more than most. As the psychologist Urie Bronfenbrenner noted many years ago,

> We began our inquiry by seeking out... [those] who were outstanding
> in their participation in community affairs. Such persons were not
> difficult to find. Among residents of the community, as among our own
> observers, there was clear consensus about a score of individuals who
> were judged to be the guiding lights of community endeavor. Moreover,
> these persons did appear to differ in their social outlook from the
> ordinary citizen and especially from the non-participant in community
> affairs. (Bronfenbrenner, 1960, p. 54)

While the so-called dragons of inaction, that is, the psychological barriers that limit the human mitigation and adaption to climate change are under study by psychologists (Gifford, 2011), this study takes an alternative approach. Instead of considering behavior, attitude, and motivation modification or change, this study seeks to move toward the development and optimization of those individuals that already manifest those behaviors and attitudes most equitable with collaborative adaptation to climate change and generating a transition toward a sustainable community future; from the local to the global community level.

Who and where are these people? As Bronfenbrenner suggests, those persons are not difficult to find. Fortunately, an increasing number of individuals are forwarding initiatives for sustainability. They are variously described in the literature as world benefit leaders, cultural creatives, evolutionary leaders, positive deviants, social entrepreneurs, international social workers, sustainability champions, adaptive network leaders, knowledge managers, transition managers, and boundary managers. Active in a variety of settings from small rural villages to multinational corporations, they are considered key agents for change in public opinion, for example on global climate change (Krosnick, et al., 2006) and key agents for public action, for example by building local capacity rather than encouraging dependency (Bornstein, 2007). In general terms, these individuals can all be regarded as community leaders for sustainability (CLS) because through their unrelenting drive, leadership and/or management they are all striving toward the achievement of the various criteria (goals, targets, indicators) and driving the social changes necessary for global sustainable development (c.f. Parris & Kates, 2003). CLS are often engaged in action beyond their local communities and institutions, often linking local communities and institutions across cultures and across scales (c.f. Bradley et al., 2009) suggesting that the phenomenon is based in global similarities, that is, shared human attributes, rather than differences. It is the CLS that will likely be most effectual in helping to drive communities toward what are seen as the optimum limits of a community's adaptation to climate change (c.f. Adger et al., 2009).

CLS individuals demonstrate so-called key competencies in both general terms of "how they work" (Wiek, Withycombe, & Redman, 2011) as well as, more specifically, key attributes of individual and social behavior, attitudes, and motivation (Wensing, 2012, 2013). Thus, in my research I seek to characterize the psychological and sociocultural competencies that make CLS effective, and those that make the communities they seek to help generate sustainable. My questions include: are certain characteristics shared across cultures and can they be further developed through cross-cultural collaboration on sustainability initiatives?

Within the context of this study I seek to observe adaptation strategies of Arctic communities to climate change to profile best practices and add to the research and development of social indicators by providing both quantitative and qualitative measures of success. The premise here is that adaption strategies to climate change are social phenomena that can be guided by indicators not only related to well being of communities in general, but also by indicators related to the development of optimum community leadership and community dynamics for adaptation to climate change; both within and between communities in general, and also within and between collaborative communities for sustainability (CCS) in particular.

Ultimately, the goal is to develop a means by which to optimize those attitudes, behaviors, and motivations most equitable with adapting to climate change and for transitioning toward a sustainable future. This study seeks to profile and then help

develop those individuals that already display some of these characteristics. Optimizing existent individual and community behavior, attitudes, motivation, and collaborative dynamics compliments positive inquiry (Whitney & Trosten-Bloom, 2010); a recommended guiding approach in rural community development (Emery & Flora, 2006), and addresses the urgency with which climate change adaption must occur by focusing on the faster acting optimization approach rather than an individual transformation approach.

5. The Sustainable Futures Protocol

A quick review of the literature reveals some 30 or more promising adaptation strategies in the sustainability transitions and climate change literature; presented in both theory and in multiple case studies. Three of the more promising strategies appear to be adaptive co-management (Armitage et al., 2007), community capitals framework (Flora & Flora, 2008), and knowledge systems for sustainable development (Cash et al., 2003).

Most recently, I am researching and developing an approach I have called the Sustainable Futures Protocol (SFP) within which the best practices from the spectrum of adaptation strategies can be incorporated (Wensing, 2012, 2013). The distinction of the SFP, however, is that it seeks to identify, assess, and develop an idealized set of behavior and attitudes for community leaders for sustainability (CLS) that will make them most successful across boundaries in both their collaborative communities for sustainability (CCS), as well as their target communities in general.

The SFP is a mixed methods approach utilizing both qualitative and quantitative research input. Integrating qualitative and quantitative research in social science is not new (c.f Jick, 1979) and appears to be an optimal approach in understanding the human dimensions to climate change adaptation (c.f. Denscombe 2008; Harrison et al., 2012).

This Arctic adaptation strategies project will support the development of the SFP and, conversely, ongoing SFP research in other regions including the Caribbean and continental USA will help inform this Arctic project. For instance, many investigators consider tropical island communities and Arctic communities on the forefront of the effects of climate change (for example, see www.manystrongvvoices.org).

6. Measuring Social Change

How do you best measure social change toward or away from well-being? Berman (2011) proposed 19 indicators along the six domains of the ASI report (Larsen, Schweitzer, & Fondahl, 2010). In psychological research, Minkov (2009) identified several factors such as "life control" as a key facet of well-being that is shared by societies in 97 nations worldwide, especially in those that lack a cultural legacy of highly intensive agriculture.

Among others, Mccool and Stankey (2004) have argued that public inclusiveness is necessary, that the search for sustainability has been dominated by the scientific elite making it, largely, a technical/scientific exploration when it is, in their view, actually a moral and ethical issue.

It is now widely acknowledged that the social development of a community is the most difficult of the so-called three pillars upholding sustainable development (economic and the environment being the other two) (c.f. Boström, 2012) and that social capital is possibly the most important of all the so-called capitals of a sustainably developing society (Emery & Flora, 2006); notably, I have recently argued (Wensing, 2012, 2013) that development of identity capital (Côté 1996, 2011) and psychological capital (Luthans et al., 2004, 2007; Walumbwa et al., 2009) are key dimensions in a societies transition toward sustainability.

As a construct and field of inquiry human well-being has long been part of the research agenda in psychology. For instance, McNulty and Fincham (2012, p.101) have recently argued that "any movement to promote well-being may be most successful to the extent that it (a) examines the conditions under which the same traits and processes may promote versus threaten well-being, (b) examines both healthy and unhealthy people, (c) examines well-being over substantial periods of time, and (d) avoids labeling psychological traits and processes as positive or negative." The next step, and a goal of this research, is to ascertain how these psychological theories can be applied to the context of Arctic communities seeking to adapt to climate change.

7. Data Sources - Comparative Research

Qualitative research methods will be utilized in this research. Five common approaches to qualitative research in the social sciences are narrative research, phenomenology, grounded theory, ethnography, and case study: interviewing and observation are often used as data collection sources in all five approaches (Creswell, 2013).

Feedback to research participants and communities from the various community research cycles observations and interviews will be utilized to incite further network participation and collaboration, especially with regard to moving toward mitigating the limitations of comparability and filling the data gaps Berman (2011) noted in his research.

With regard to Arctic community adaptation to climate change this study will seek to:

Observe changes
Observe challenges
Observe collaboration
Observe coordination
Observe assessments of success and failures

This study will compare all of the above between various Arctic communities worldwide.

Collection of data will require the participation of a wide field of researchers, community stakeholders, students, etc. In my experience, many community leaders for sustainability (CLS) are forthcoming with telling their story, describing the challenges of their initiatives, their successes and failures, and their visions for a sustainable future and the best way to get there.

7. Study's Intellectual Merit, Broader Impact and Contribution to the AON-SIP

Adaptation to climate change is a complex challenge for communities worldwide, with certain specificities to location (for example, urban versus rural populations) and culture. Nonetheless, there appears to be a great degree of similarity with regard to adaptation strategies and the people most active in forwarding those strategies. (c.f. Bierbaum et al., 2013; Flora & Flora, 2008; Moser & Ekstrom, 2010; Wensing, 2012).

i) Intellectual Merit

The applied psychology approach of this study will explore the behavior, attitudes and motivations most equitable with generating community resilience through the development of adaptation strategies in the face of climate change.

Communities seeking to transition toward sustainability must include various experts and stakeholders, both local and non-local in the action based collaborative process.

The intellectual merit of this study is therefore that it will be of interest to the wide variety of participants of the collaborative communities seeking to bridge knowledge into action at the local and global level. It will inform them as to best practices for adaptation to climate change. Which behaviors work and which don't.

ii) Broader Impact

Observations of ongoing initiatives toward climate change adaptation that serve to help inform best practices are of interest to all societies on our shared planet. The Arctic communities like small island communities can serve as a role model for the rest of the world.

Developing valid and effective adaptation strategies at the local level and linking these initiatives worldwide is the next step in generating a sustainable global future.

iii) Contribution to the AON-SIP

The AON-SIP sought to develop a system of social observations that could be utilized to compile and compare data that could be analyzed for its adequacy with regard to three objectives, namely: "observing changes in well-being of arctic residents, observing arctic changes relevant to global society, and understanding ongoing social change in the arctic" (Berman, 2011, p. 125).

Through observation, interview, and project result feedback to the participants and communities this Arctic Adaptation Strategies Project (AASP) seeks to contribute to the continuation and expansion of the AON-SIP in several ways. This includes:

Further elucidate the climate related social changes in the Arctic
Compare community based adaptation strategies to those changes
Seek to motivate improved data collection for cross region comparison

Ultimately, the purpose of this study is to build a collaborative and comparative research network for linking CLS and their respective CCS as they seek to help their

communities mitigate and adapt to climate change and transition toward sustainability worldwide. Cross-border collaboration through the inherent motivation of CLS is a powerful way to forward and sustain the long-term well-being of Arctic populations as guided by a concurrent growing understanding of how to effectively act upon social indicators without compromising the sustainability of future generations.

The best adaptive changes are those that build resilience, reduce vulnerability, and empower human flourishing within a sustainable context. The social drivers of those types of changes appear both emergent and embedded within and between communities. The development of key competencies described from within culture (c.f. Owlijoot, 2008) and science (c.f. Wensing, 2012, 2013; Wiek, Withycombe, & Redman, 2011) promise to help lead the way.

The work of this study goes beyond documenting social impacts of climate change and identifying adaptation criteria. It seeks to identify, evaluate, and prioritize adaptation strategies. Data will be compared across communities to develop models of these strategies into replicable collaborative action systems. Acting through networks, CLS will help disseminate and drive these systems forward.

8. References

Adger, W. N., Dessai, S., Goulden, M., Hulme, M., Lorenzoni, I., Nelson, D. R., et al (2009). Are there social limits to adaptation to climate change?. *Climatic change*, *93*(3), 335-354.

Anderies, J. M., Rodriguez, A. A., Janssen, M. A., & Cifdaloz, O. (2007). Panaceas, uncertainty, and the robust control framework in sustainability science. *Proceedings of the National Academy of Sciences of the United States of America. 104,* 15194-15199.

Armitage, D.R., Plummer, R., Berkes, F., & Doubleday, N.C. (2007). (Eds.). *Adaptive co-management: Collaboration, learning, and multi-level governance.* UBC Press: Vancouver, B.C.

Berman, M. (2011). Next steps toward an Arctic human dimensions observing system. *Polar Geography, 34,* 125-143.

Bierbaum, R., Smith, J. B., Lee, A., Blair, M., Carter, L., Chapin, F. S., et al. (2013). A comprehensive review of climate adaptation in the United States: more than before, but less than needed. *Mitigation and Adaptation Strategies for Global Change*, 1-46.

Bornstein, D. (2007). *How to change the world: Social entrepreneurs and the power of new ideas.* New York: Oxford University Press.

Boström, M. (2012). The problematic social dimension of sustainable development: the case of the Forest Stewardship Council. *International Journal of Sustainable Development & World Ecology,19,* 3–15.

Bradley, E. H., Curry, L. A., Ramanadan, S., Rowe, L., Nembhard, I. M., & Krumholz, H. M. (2009). Research in action: Using positive deviance to improve quality of health care. *Implementation Science, 4,* 1-11.

Bronfenbrenner, U. (1960). Personality and participation: The case of the vanishing variables. *Journal of Social Issues*, *16*(4), 54-63.

Cash, D. W., Clark, W. C., Alcock, F., Dickson, N. M., Eckley, N., Gustson, D. H., et al. (2003). Knowledge systems for sustainable development. *Proceedings of the National Academy of Sciences of the United States of America, 100,* 8086-8091.

Costello A, Maslin M, Montgomery H, Johnson AM, Ekins P. (2011). Global health and climate change: moving from denial and catastrophic fatalism to positive action. *Philososphical Transactions A: Mathematics, Physics and Engineering Science, 369* (1942), 1866-1882.

Côté, J.E. (1996). Sociological perspectives on identity formation: The culture-identity link and identity capital. *Journal of Adolescence, 19,* 417- 428.

Côté, J.E. (2011).The place of the positive youth development perspective within the larger project of mapping human development: Invited commentary. *Journal of Adolescence 34,* 1225–1227.

Creswell, J. W. (2013). (3rd Ed.). *Qualitative inquiry and research design: Choosing among five approaches*. Thousand Oaks, CA: SAGE Publications.

Denscombe, M. (2008). Communities of practice: A research paradigm for the mixed methods approach. *Journal of Mixed Methods Research, 2,* 270- 283.

Emery, M., & Flora, C. (2006). Spiraling-up: Mapping community transformation with community capitals framework. *Community Development*, *37*(1), 19- 35.

Flora, C. & Flora, J. (2008). *Rural communities: Legacy and change* (3rd Ed.). Boulder, CO: Westview Press.

Ford, J. D., Bolton, K., Shirley, J., Pearce, T., Tremblay, M., & Westlake, M. (2011). Mapping human dimensions of climate change research in the Canadian Arctic. *AMBIO: A Journal of the Human Environment*, 1-15.

Ford, J. D., Pearce, T., Duerden, F., Furgal, C., & Smit, B. (2010). Climate change policy responses for Canada's Inuit population: the importance of and opportunities for adaptation. *Global Environmental Change*, *20*(1), 177-191.

Freyd, M. (1926). What is applied psychology?. *Psychological Review*, *33*(4), 308.

Gifford, R. (2011). The dragons of inaction: Psychological barriers that limit climate change mitigation and adaptation. *American Psychologist*, *66*(4), 290.

Hamilton, L. C., & Lammers, R. B. (2011). Linking pan-Arctic human and physical data. *Polar Geography*, *34*(1-2), 107-123.

Harrison, P. A., Holman, I. P., Cojocaru, G., Kok, K., Kontogianni, A., Metzger, M. J., & Gramberger, M. (2012). Combining qualitative and quantitative understanding for exploring cross-sectoral climate change impacts, adaptation and vulnerability in Europe. *Regional Environmental Change*, 1-20.DOI 10.1007/s10113-012-0361-y

Haslam, S. A., Jetten, J., Postmes, T., & Haslam, C. (2008). Social identity, health and well-being: An emerging agenda for applied psychology. *Applied Psychology*, *58*(1), 1-23.

Jick, T. D. (1979). Mixing qualitative and quantitative methods: Triangulation in action. *Administrative science quarterly*, *24*(4), 602-611.

Krosnick, J. A., Holbrook, A. L. Lowe, L., & Visser, P. S. (2006). The origins and consequences of democratic citizens' policy agendas: A study of popular concerns about global warming. *Climatic Change, 77,* 7–43.

Kruse, J., Lowe, M., Sharman, H., Fay, G., Hamilton, L., & Berman, M. (2011). Arctic observing network social indicators project: overview. *Polar Geography, 34,* 1-8.

Larsen, J.N., Schweitzer, P. & Fondahl, G. (2010). (Eds.) *Arctic social indicators: A follow-up to the Arctic Human Development Report.* Copenhagen: Nordic Council of Ministers.

Laszlo, K. C. (2012). From systems thinking to systems being: The embodiment of evolutionary leadership. *Journal of Organisation Transformation & Social Change*, *9*(2), 95-108.

Leiserowitz, A., Maibach, E., Roser-Renouf, C., & Hmielowski, J. (2012). Global warming's six Americas, March 2012 & Nov. 2011. *Yale University and George Mason University. New Haven, CT: Yale Project on Climate Change Communication*.

Luthans, F., Avolio, B. J., Avey, J. B., & Norman, S. M. (2007). Positive psychological capital: Measurement and relationship with performance and satisfaction. Personnel Psychology, 60, 541–572.

Luthans, F., Luthans, K. W., & Luthans, B. C. (2004). Positive psychological capital: Beyond human and social capital. Business Horizons, 47, 45–50.

Mccool, S. F., & Stankey, G. H. (2004). Indicators of sustainability: challenges and opportunities at the interface of science and policy. *Environmental Management*, *33*(3), 294-305.

McNulty, J. K., & Fincham, F. D. (2012). Beyond positive psychology? Toward a contextual view of psychological processes and well-being. *American Psychologist*, *67*(2), 101-110.

Meinzen-Dick, R. (2007). Beyond panaceas in water institutions. Proceedings of the National Academy of Sciences of the United States of America, 104, 15200-15205.

Meyers, D. C., Durlak, J. A., & Wandersman, A. (2012). The Quality Implementation Framework: A synthesis of critical steps in the implementation process. *American Journal of Community Psychology*, 1-19.

Minkov, M. (2009). Predictors of differences in subjective well-being across 97 nations. *Cross-Cultural Research*,*43*(2),152-179.

Mills, M. van de Bunt, G.G., de Bruijn, J. (2006). Comparative research: Persistent problems and promising solutions. *International Sociology, 21,* 619–631.

Moser, S. C., & Ekstrom, J. A. (2010). A framework to diagnose barriers to climate change adaptation. *Proceedings of the National Academy of Sciences*, *107*(51), 22026-22031.

Nymand Larsen, J., Schweitzer, P. Fondahl, G. (2010). (Ed.). *The Arctic Social Indicators.* Copenhagen: Council of Ministers.

Owlijoot, P. (2008). Guidelines for working with Inuit elders. Nunavut Arctic College, Nunavut, Canada. Retrieved from http://www. arcticcollege. ca/publications/books/elder%20guide%20english. pdf

Parris, T. M., & Kates, R. W. (2003). Characterizing a sustainability transition: Goals, targets, trends, and driving forces. *Proceedings of the National Academy of Sciences of the United States of America, 100,* 8068-8073.

Pearce, T., Ford, J. D., Caron, A., & Kudlak, B. P. (2012). Climate change adaptation planning in remote, resource-dependent communities: an Arctic example. *Regional Environmental Change, 12* (4), 825-837.

Ratner, C. & Lumei, H. (2003). Theoretical and Methodological Problems in Cross-Cultural Psychology. *Journal for the Theory of Social Behaviour, 33*, 67- 94.

Safarzyńska, K., Frenken, K., & van den Bergh, J. C. (2012). Evolutionary theorizing and modeling of sustainability transitions. *Research Policy, 41,* 1011-1024.

Smelser, N.J. (2003). On comparative analysis, interdisciplinarity and internationalization in sociology. *International Sociology, 18,* 643–657

Taylor, J. (2008). Indigenous Peoples and Indicators of Well-being: Australian Perspectives on United Nations Global Frameworks. *Social Indicators Research, 87*,111–126.

Turcu, C. (2012). Re-thinking sustainability indicators: local perspectives of urban sustainability. *Journal of Environmental Planning and Management,* 1-25. iFirst article.

Walter, A. I., & Scholz, R. W. (2007). Critical success conditions of collaborative methods: a comparative evaluation of transport planning projects. *Transportation*, *34*(2), 195-212.

Walumbwa, F. O., Luthans, F., Avey, J. B., & Oke, A. (2009). Authentically leading groups: The mediating role of collective psychological capital and trust. *Journal of Organizational Behavior*, *32*(1), 4-24.

Whitney, D. D., & Trosten-Bloom, A. (2010). The Power of Appreciative Inquiry: A Practical Guide to Positive Change (Revised, Expanded). San Francisco: Berrett-Koehler Publishers.

Wensing, E.J. (2012). *A social science research protocol for the assessment and development of community leaders for sustainability and sustainable communities.* 127 pages. Saybrook University Doctoral Dissertation: Proquest 3541444.

Wensing, E.J. (2013). Human Development for Sustainability: An Adaptation and Evolution Strategy Beyond Going Green from Psychology. (*Manuscript in preparation).*

Wiek, A., Withycombe, L., & Redman, C. L. (2011). Key competencies in sustainability: a reference framework for academic program development. *Sustainability Science*, *6*(2), 203-218.

....