



Citizen and Community Science for Resilience Education

Linking program design and outcomes in diverse learning environments

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International
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Resilience

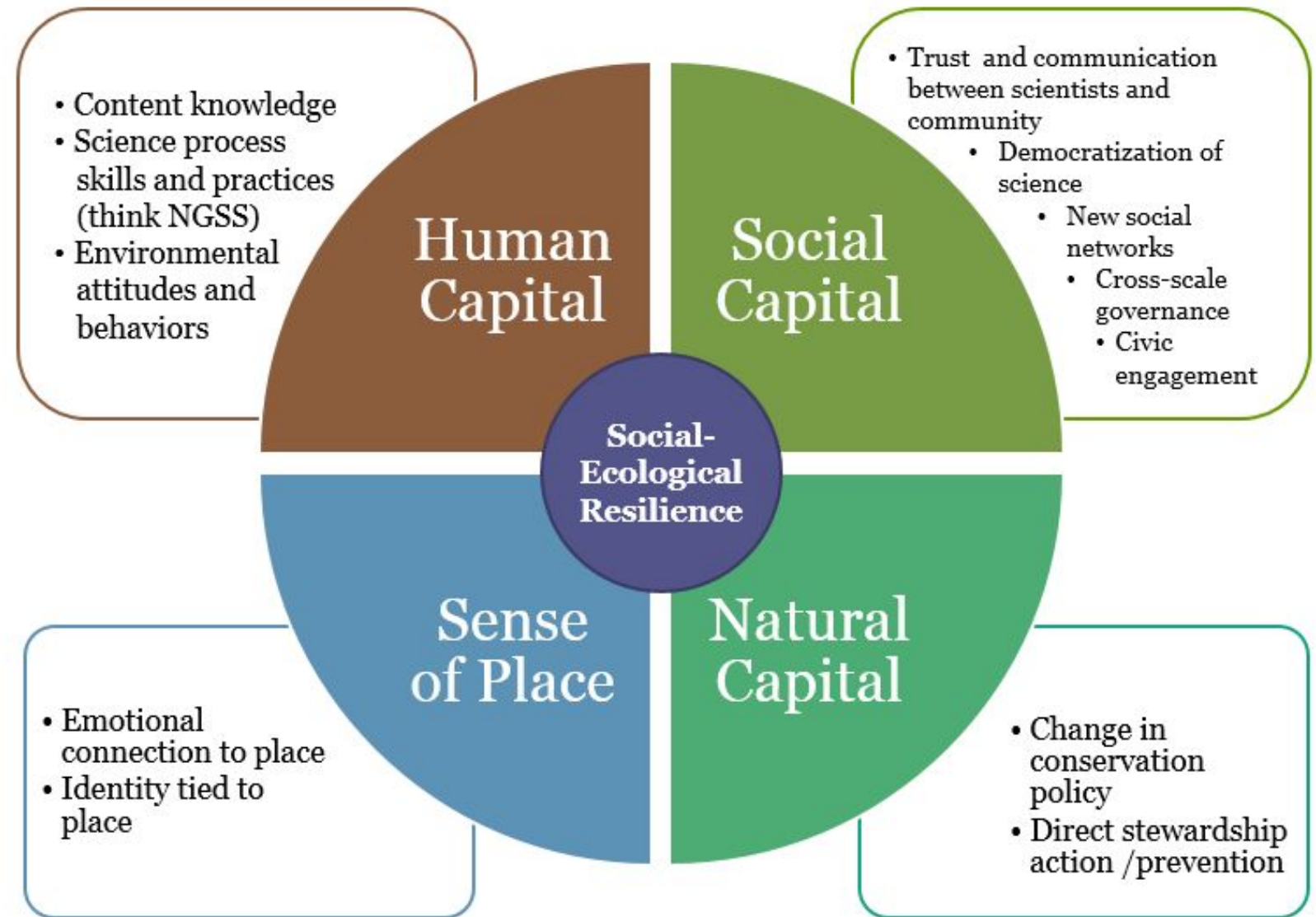
The ability of a system to anticipate, absorb, accommodate and shape the path to a desired state after a disturbance.



Community and Citizen Science can support community resilience.



Documented outcomes from Citizen Science



**The design of
community &
citizen science
programs
influences the
outcomes.**



**Theoretical or
generalizable
priorities**



**Local
Community
priorities**

Element	Contributory	Co-Created
Question	Researcher	Community members
Methods Design	Researcher	Community Members & Researcher
Data collection	Community members	Community members
Data Analysis	Researcher	Community Members & Researcher
Use of findings	Researcher & Community Members	Community Members & Researcher

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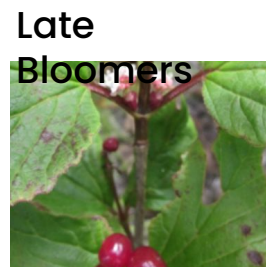
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Use of findings	Researcher & Community Members	Community Members & Researcher
	<p>Large Scale Publishable dataset, Large scale policy impact, Slower timescale for impact, Shorter timescale for program design</p>	<p>Deep Individual learning, Local policy impact, Rapid timescale for impact, slower timescale for program design</p>

A decade of public science projects

Theoretical or generalizable priorities



Local Community Priorities



Communities	5	23	17	30	20 CBMT + 80 CitSci	80
People Involved	800	107	240	1500+	917	2860
Budget	\$	\$	\$\$	\$\$\$	\$\$\$\$	\$\$\$\$





Arctic and Earth SIGNs

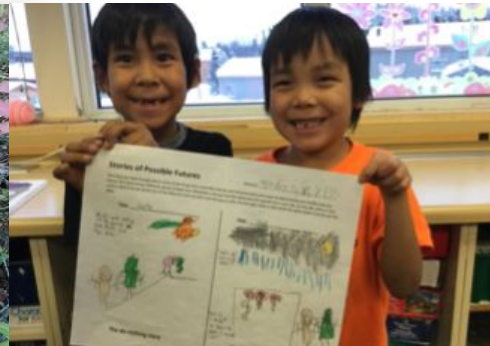
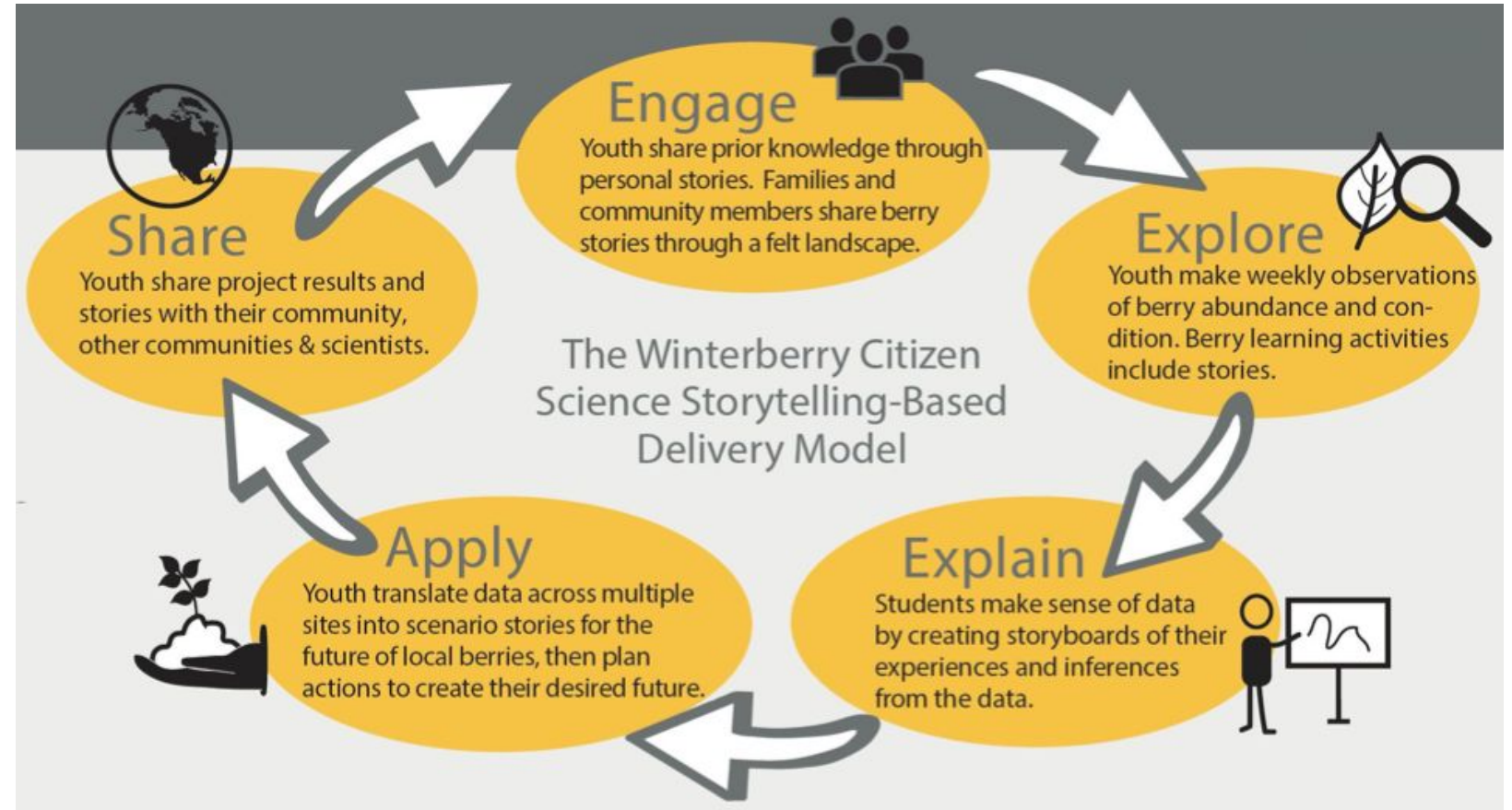
Co-produce
local
projects,
connect to
global
projects





Winterberry

Supplement
contributory
projects with
storytelling

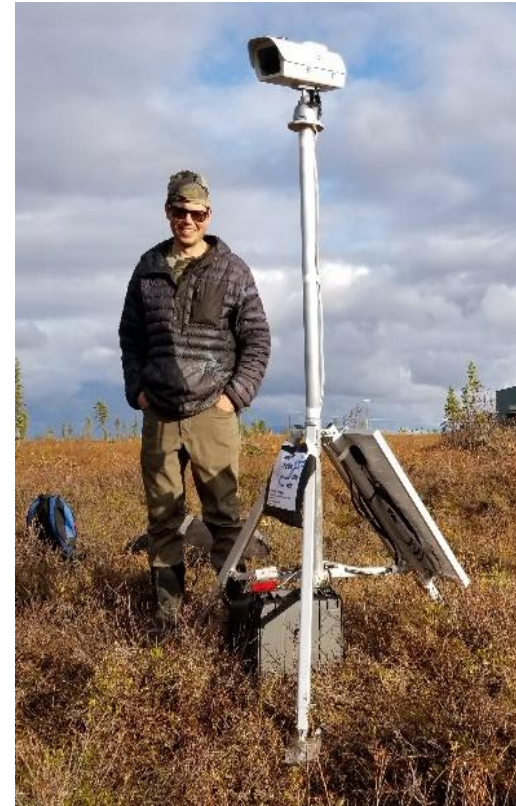




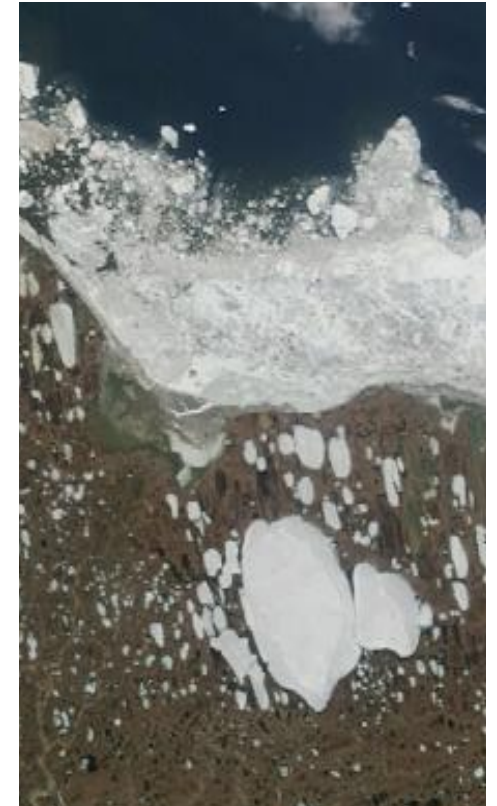
Multiple
modes of
engagement
increase
diversity of
participation.



Surveys and field studies



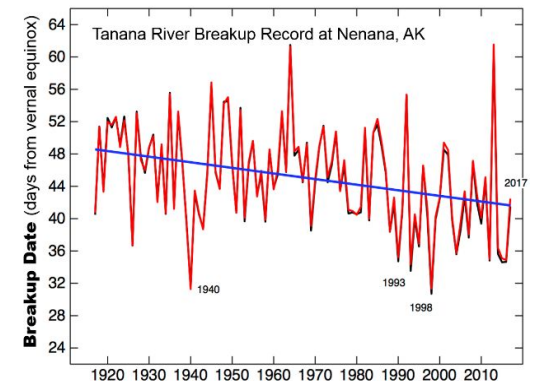
Real-time cameras & ice buoys



Remote Sensing



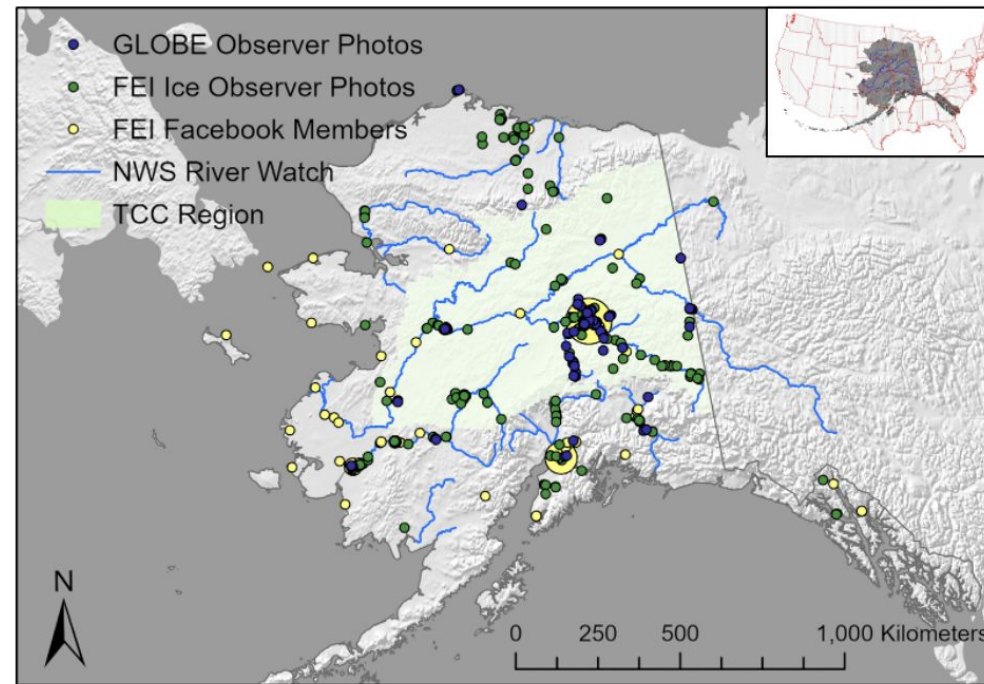
Community Based Monitoring and Education



Archiving and analysis of
historical data



Multiple modes of engagement & real time use of data enhances community resilience.



Data for Today:

- Ice thickness
- Ice conditions sharing across social media
- NWS winter travel safety and flood forecasting



Data for Tomorrow:

- Long term planning for winter travel timing and routes
- Trend analysis for changing ice conditions
- Youth data literacy and education

Take Home...

- **Think and Listen** - What resilience-related attribute needs to be supported?
- **Act and Evaluate** - Be collaborative, creative and deliberate in the design of community and citizen science projects and evaluate the outcomes.



Credit: T. Gentry





Contact

WEBSITES

<https://sites.google.com/alaska.edu/winterberry/>

<https://arcticandearthsigns.org>

<https://www.fresheyesonice.org>

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National Science Foundation Awards

- 1713156 (Arctic Harvest-Winterberry)
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- 1636476 (Bonanza Creek LTER)
- 1836523 (Fresh Eyes on Ice)

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NASA Awards

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