Dynamic Household Water Insecurity

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Anthropology of Household Water Insecurity (HHWI)

The focus on household water insecurity is new within Anthropology. Broadly, there are several questions anthropologists explore related to water that contribute to our understanding of household water insecurity:

- How inadequate access to clean water and sanitation affects daily life.
- Contributing factors and dimensions (environmental, political, economic, cultural)
- Effects of climate change
- Effects of HHWI on health

Why pay attention to culture?

- **Cultural questions are important for understanding and addressing health issues**
  - Source preferences
  - Acceptability of infrastructure/costs
  - Trust and frustration
  - Social relationships involved
  - Health-related practices
- **Past experiences, behaviors and perceptions affect health and health-related practices.**
- **Structural inequalities affect health.**
  - poverty, gender inequalities, etc.
- **Ethnography provides vignettes**
  - Compelling exemplar stories that reflect broader trends in the data based on substantial research.
  - (Not anecdotal accounts.)

What is Household Water Security (HHWS)?

- **Household water security**: The ability to access and benefit from affordable, adequate, reliable and safe water to meet all domestic, health, and cultural needs.[1]

- **Household water <u>insecurity:</u>** "when at least one of these variables is reduced or unattainable"[1]

- Water insecurity is an **involuntary condition.**
  - **It means uncertainty:** Water insecurity means not knowing where or how much water you will be able to benefit from for a prolonged period of time.
  - **It is something beyond the immediate control of the household.**

References: [1]Jepson, Wutich, Collins, et al (2017)

Household Water Security (HHWS)

- Water security is tied to **hydro-social relations[1]:**
  - **Social/cultural relationships involved in access**
    - Examples: Who hauls water in household, water plant operators, policymakers…
  - **These relationships can have particular local importance.[2]**
    - For example, children hauling water for Elders provides opportunities for the transfer of traditional knowledge. Young men hauling water and honey buckets can constitute important and valued contributions to the household.
- As well as political, economic, environmental and other cultural factors[1, 3]

References: [1]Jepson, Budds, Eichelberger, et al (2017); [2]Eichelberger (2017); [3]Wutich, Budds, Eichelberger, et al (2017)

Dynamic Household Water Insecurity:

Reliability affects consumption

- Household **water security**: The ability to access and benefit from affordable, adequate, **reliable** and safe water.
- **But we often use static measurements to describe the problem:**
  - 30+ unserved villages (ADEC)
  - 15% of housing units in rural Alaska lack water and sewer services (HA2020)
- **Household water (in)security not a static state**
  - Varies throughout the year/year-to-year.
  - Disconnections for non-payment
  - Service interruptions: freeze-ups
  - Changes in household demographics (movement, death)
  - Changes in quality and/or perceived safety
- **My focus: Sudden or prolonged changes in access and/or water sources that affect consumption patterns in ways that may threaten health and wellbeing.**

Dynamic Household Water Insecurity

- **Household water security in rural AK is affected by numerous factors, including:**
  - policy, economy, the natural environment, the built environment (infrastructure and energy)
  - Cultural factors
  - Household demographics/hydro-social relations

- **Dynamic household water insecurity in AK will likely grow due to**
  - Climate change
  - Reduced funding for infrastructure
  - Aging infrastructure…

- **Public health significance: We need to understand…**
  - Household responses to fluctuations in access, sources, and trust that may promote health
  - Responses that may threaten health

  … so we can better address the problem of dynamic HHWI and its health effects.

My research: Ethnographic case studies of dynamic HHWI

Two primary questions:

- 1) **Dynamic water insecurity and daily life:**
  - How do fluctuations in access, trust, and sources affect water consumption and sanitation, both within the household unit and community?
    - Sources, uses, rates of consumption, trust…
  - How affect daily life
    - Stigma, health, risk perceptions…
- 2) **Responses:**
  - How do households and communities respond?
  - How tribal, state, and federal organizations understand problem and respond?

Methods

- **2008-2009; 2015-Present**
  - semi-structured interviews, observation, participation,
  - 9 Iñupiaq and Yup'ik communities
  - 136+ residents, interviewed multiple times
  - (50+ individuals in tribal, state and federal organizations)

Dynamic HHWI: Effects and responses include…

- **Sudden changes usually result in:** Lower consumption, greater/variable distance to sources, greater time involved in access, reliance on multiple sources, rationing

Household responses:

- **Rely on hydro-social relations, social networks*:**
  - Haul water <u>from</u> kin and neighbors
  - Haul <u>for</u> kin and neighbors
  - Use showers, toilets, laundry of kin and neighbors
  - Pay others to haul water, honey buckets
- **Rely on multiple sources (treated, untreated, traditional)**
  - Use **traditional knowledge** to identify evaluate sources
  - Involves **social networks, vehicles**
- **Ration water- household and community levels**
  - may include diet

*Important for women and Elders' access, households without vehicles

(Eichelberger 2010 AJPH; Eichelberger 2017 Environmental Science and Pollution Research)

Selawik: dynamic HHWI in "served" community

- Vacuum water/sewer system
- User fees: $200-250/month
- Perpetual issues
  - O&M
  - Yearly freeze-ups
  - High fees/Low affordability
  - High costs/low revenue & collection rates
  - Debt…
- Climate change

Selawik: dynamic HHWI in "served" community

Year[1]	Occupied Homes	Piped: Billed	Piped: Disconnected	Honey bucket
2016	184	160	12	12
2017	187	93	79	15

In 2017, the number of households disconnected from in-home piped water and sewer services dramatically increased:

- 42% of all occupied households were not served.
- 46% of the 172 "served" households disconnected.

Dec. 28, 2017: freeze up of "Island side"

- 40+ households lost service
- (possible double-counting of disconnected households)

[1]Data provided by Maniilaq Association

Responses to changes in access: Selawik (prelim. data)

Approximate locations of untreated/unregulated domestic water sources in Selawik (prelim. participant mapping data, Eichelberger unpublished)

Haul water from:

- Neighbors, kin
- Traditional/unregulated sources
- Pay someone to haul
- Amount haul varies by use, availability

Purchase:

- Drinking water
- Disposable dishes/utensils
- Microwavable food

Honey buckets

- Dump in river or haul to landfill – cross contamination (kids)
- Pay someone to haul

Dynamic HHWI: Responses include…

- **Water conservation strategies:**
  - **Pre-prepared food that doesn't require water (i.e. microwavable)**
  - Paper plates, cups, utensils – in order to conserve water
  - Reusing water in washbasins, washing machines
  - Reduced hygiene (bathing, laundry, dishes, etc.)
  - Reduce water used for cooking
- **May or may not treat water from traditional sources**
- **Leaving community** (less common?)
- Elders report that **younger generations less prepared to respond** effectively to sudden changes or lost water/sewer services

Newtok: domestic water access

- **"Unserved" village: self-haul & honey bucket**
  - Haul water by hand, wheelbarrow, sled, ATV…
  - No sewage/honey bucket lagoon
- **<u>Variability built into daily life:</u>**
- **Self haul severely limits access & consumption**
  - Avg. 1.9 gal/person/day (WPO records)
  - Avg. 1.43-2.34 gal/person/day (self reported, N=10 households)
  - WHO: 13.2 gal/person/day
  - SPHERE disaster responses: 2-4 gal/person/d
- **Traditional water source consumption**

Teenaged boy hauls water from water treatment plant in a 33-gal bucket about 2/3 full.

Self-haul households: **variability of access built into daily experience**
Amount of water brought into and consumed by home can vary greatly.
(Newtok 2016 data)

Household	# in Household	Minimum amount hauled per week (gal)	Maximum amount hauled per week (gal)	Average minimum water consumption (gal/p/d)	Average maximum water consumption (gal/c/d)
1	1	10	10	1.43	1.43
2	4	100	100	3.57	3.57
5	6	25	100	0.60	2.38
7	7	210	210	4.29	4.29
9	9	30	210	0.48	3.33
10	14	175	280	1.79	2.86
Average consumption (gal/c/d)	68	680	1116	1.43	2.34
Range	1-14	10-210	10-280	0.29-2.04	0.48-4.29

Newtok: Self-reported factors that contribute to household water insecurity (Eichelberger 2017)	
Water treatment plant shut down or runs out of water	Direct access
Weather, such as a storm or flood.	Direct access
Lack of access to a boat or vehicle to haul water, snow, or ice from an alternative (untreated) source.	Direct access
Children or grandchildren don't haul sufficient amounts of treated water for household.	Interpersonal hydro-social relations
No one to help haul water, treated or untreated, particularly for Elders.	Interpersonal hydro-social relations

Hidden costs: Household (all communities)

- Gasoline
- Paying for help hauling water/honey buckets*[Δ]
- Drinking water, other beverages?(*?)
  - even if WTP still functioning
- Missed work
  - Travel with sick children, Elders*
  - Access washeteria during limited hours*
- Extra trash bags (because of disposable dishes and utensils)
- Wipes
- Hand sanitizer
- Bleach, disinfectants

*Particularly affects women/mothers

[Δ]Particularly affects Elders

Hidden costs

- **Time**
  - 15-45 minutes to/from water treatment plant
    - More if hauling from distant sources
    - Does not include prep. Time (cleaning storage container, finding vehicle, etc.)
  - 4-8 hours for laundry at washeteria*
    - Most busy on weekends
    - Limited washeteria hours
    - Depends on facility, whether washers/dryers work, etc.
    - Social spaces

*Particularly affects women/mothers

Lived experiences & responses

- **Stigma:** avoidance of smell, potential contact with human waste/pathogens
  - Of households
  - Of children at school
  - Of playing with particular children
- **Cross-contamination**
  - Sometimes concentrated in pockets
  - Limits places children can play outside safely
  - Mitigate using chemicals, gasoline to light contaminated areas on fire

- "There's a degree of likeness and dislike. Kids don't want to be partners with kids who smell."
  - Buckland teacher (2009, before the community had running water)

Lived experiences & responses

- Anxiety/concerns
  - about health of children and Elders
  - about where will get water (and how much)
  - about cleanliness of home*
  - about safety/cleanliness of environment
  - about traditional lands, water, subsistence areas
- Distrust of agencies involved in water/sewer development
- Sense of being less than full citizens

*Particularly affects women/mothers

Dynamic Household Water Insecurity (Summary)

- **Household water (in)security varies throughout the year**. It is not a static state measured solely by access.

- **Numerous factors affect HHWI throughout time:**
  - policy, economy, the natural environment, the built environment (infrastructure and energy), and cultural

- **Households responses draw on cultural knowledge and social relationships.**
  - Some responses involve hidden costs, both economic and health-related.

- **Dynamic water insecurity will likely grow** due to
  - **Climate change**
  - **Reduced funding for infrastructure**
  - **Aging infrastructure**
  - **(Other factors?)**

References

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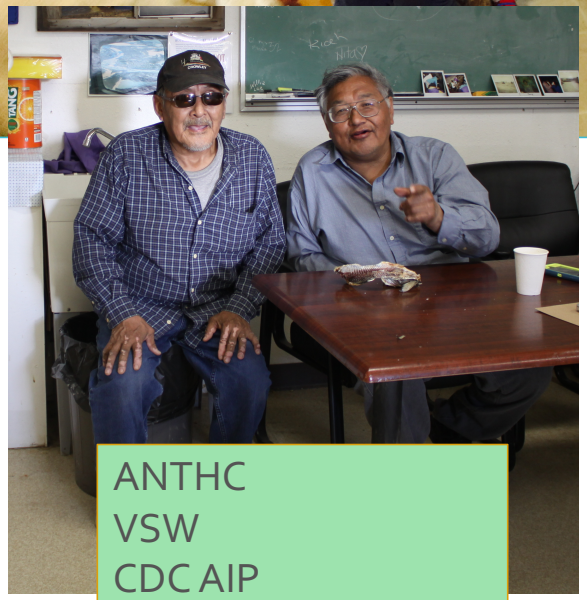

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Quyana! Taikuu! Questions?

Villages of Ambler, Buckland, Newtok, & Selawik

Maniilaq Association
Northwest Alaska Native Association
Northwest Arctic Borough
YKHC

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National Science Foundation
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