

Arctic Ecoacoustics

Matthew Burtner



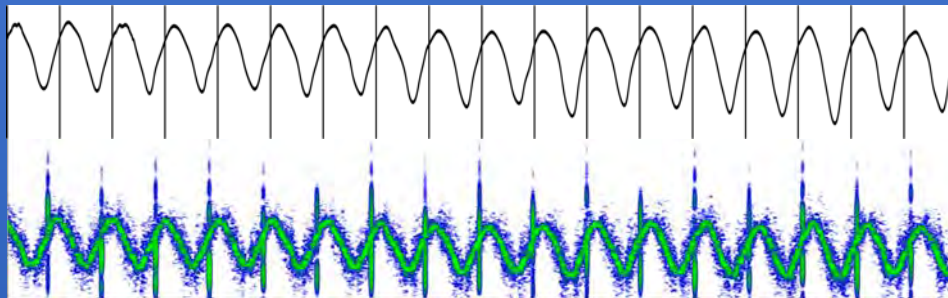
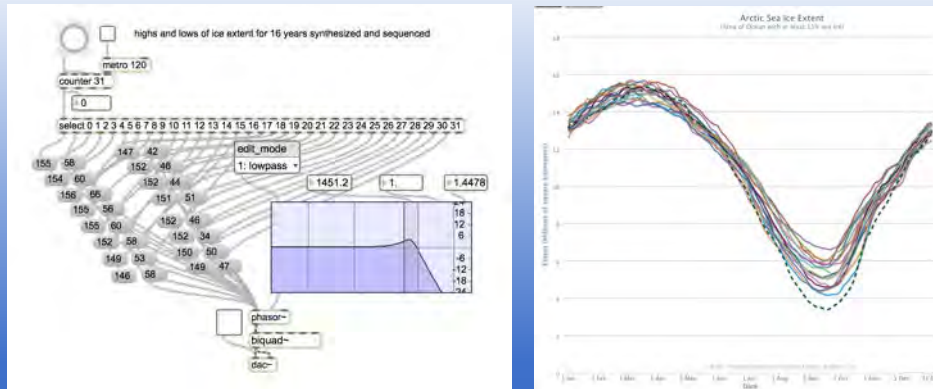
ARCUS Workshop - September 21, 2020

Ecoacoustic Music

Field Recording (vibration energy)



Sonification (data into sound)



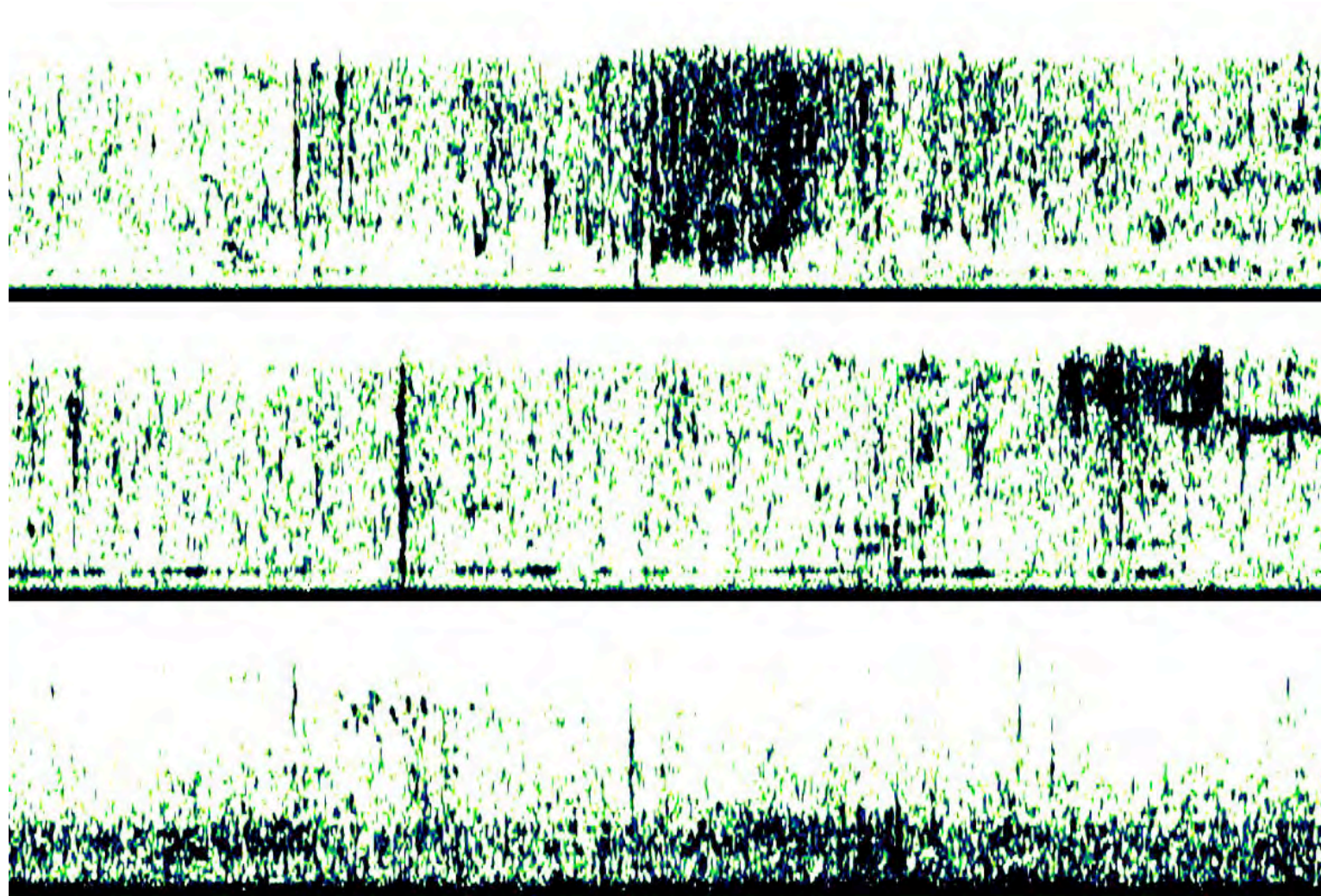
live interaction with
natural materials
(human/nature interaction)



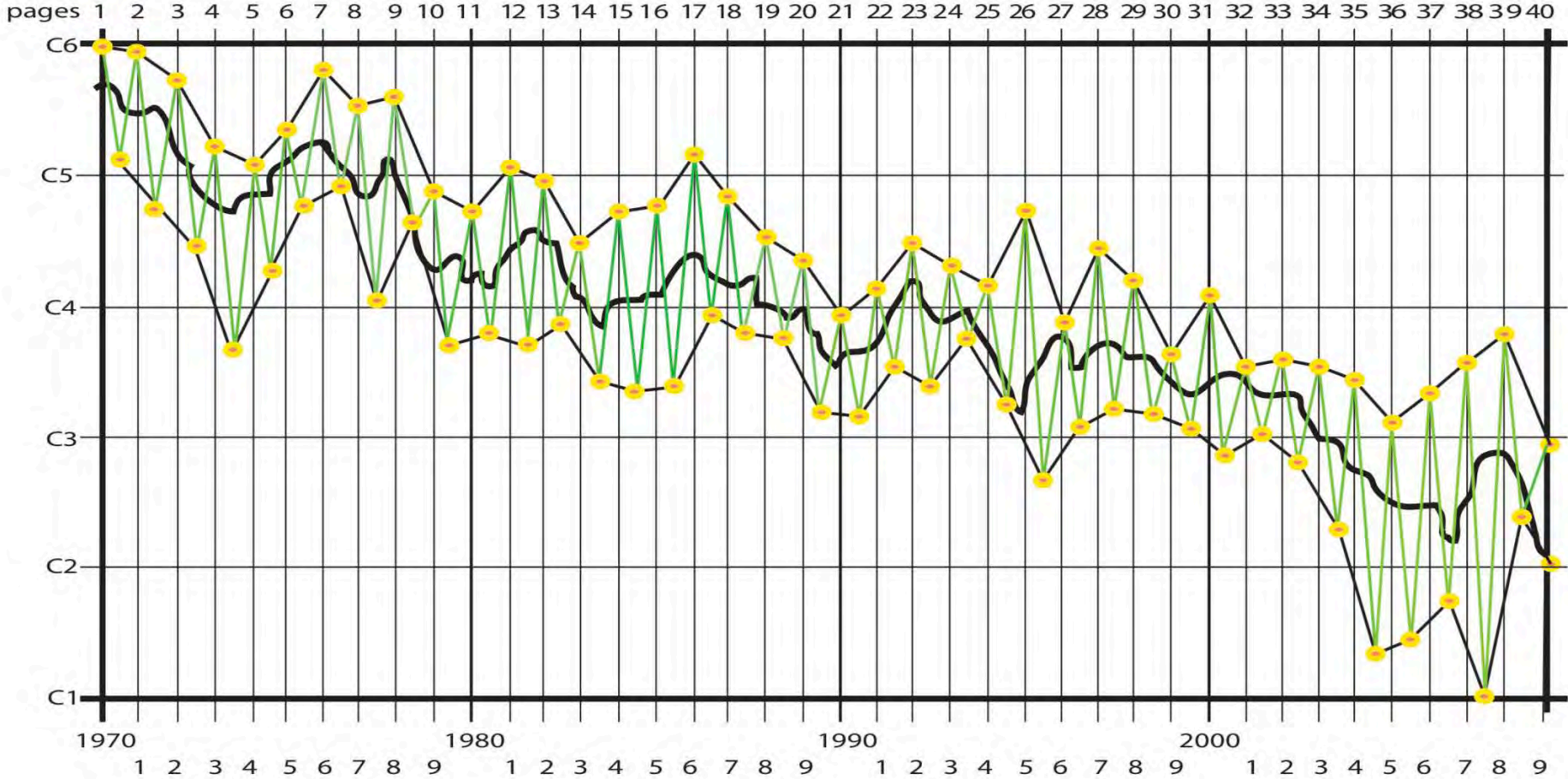
Iceprints (2009)

- Three-channel field recording under the Arctic sea ice
- Sonification of Arctic sea ice extent over 40 years used to create harmonic form.
- Ice deformation through a modulating resonant filter to create harmony. Filter coefficients set by sonification of Arctic sea ice extent.
- Real time ice deformation mapped into piano music. Piano pitch and register relative to the ice extent harmonic system.

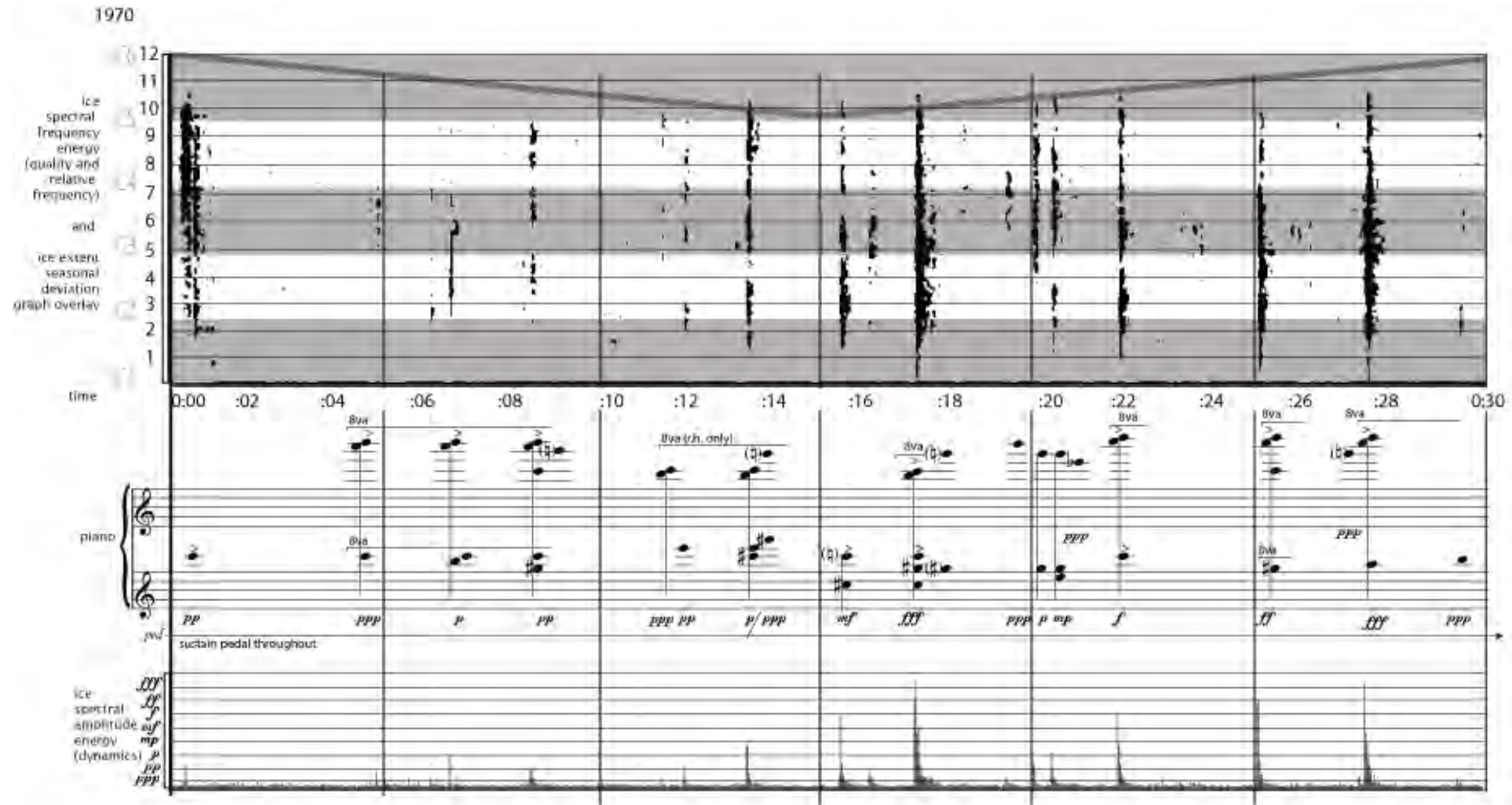
Three-channel sub-ice hydrophone recording

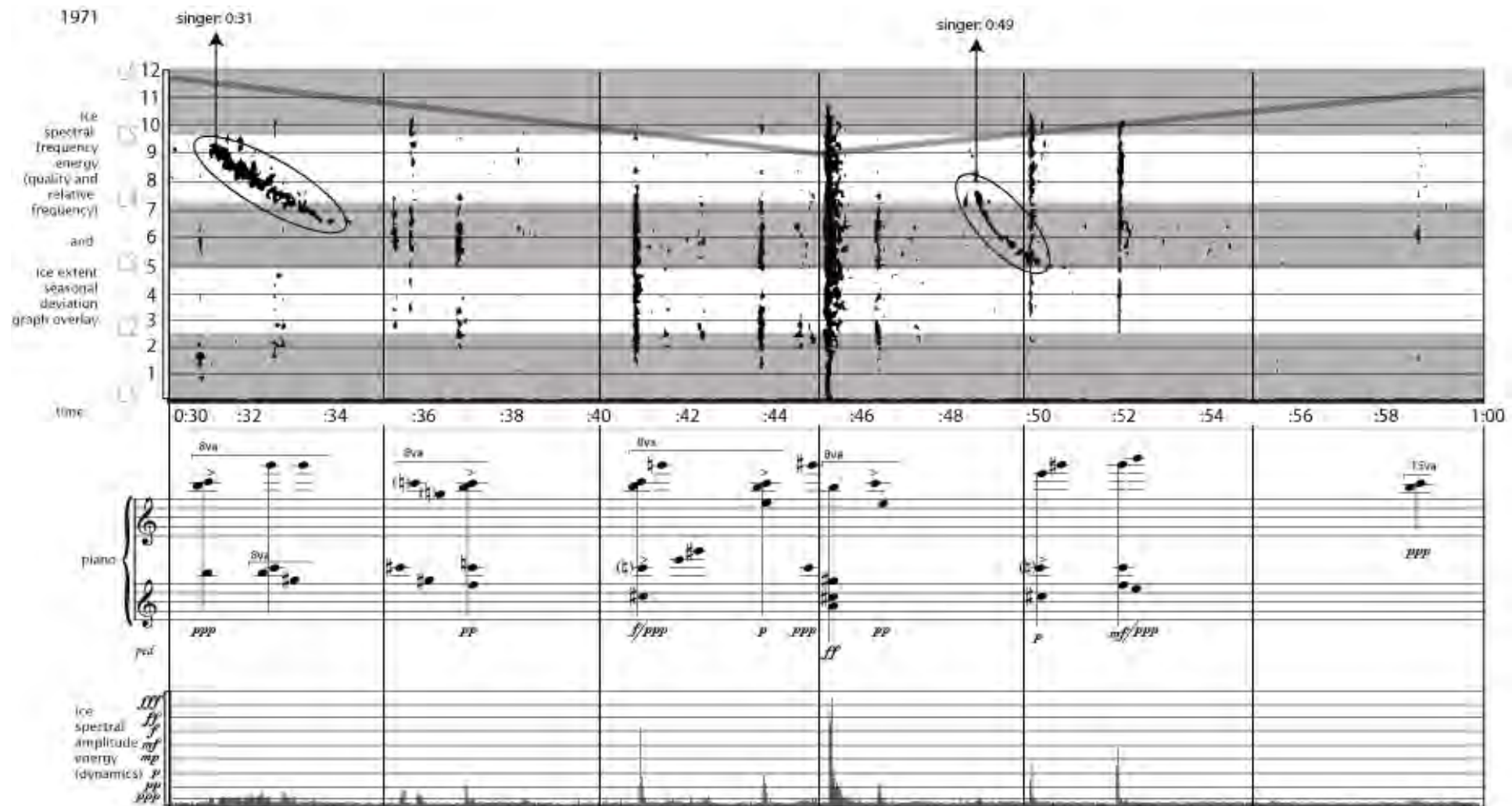


40-years of Arctic sea ice extent mapped into 40 pages of piano music



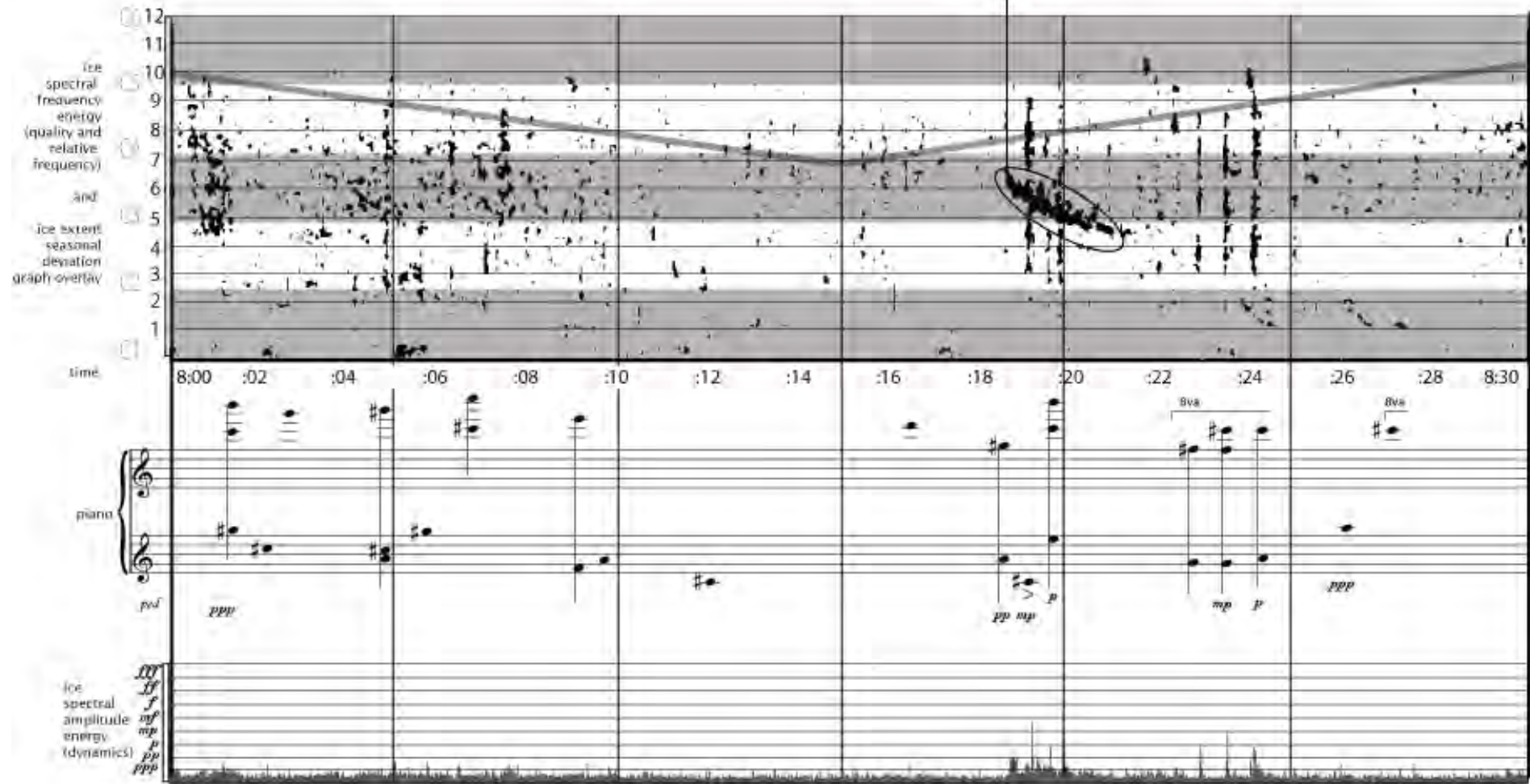
1 year of ice extent data = 30" of ice piano music

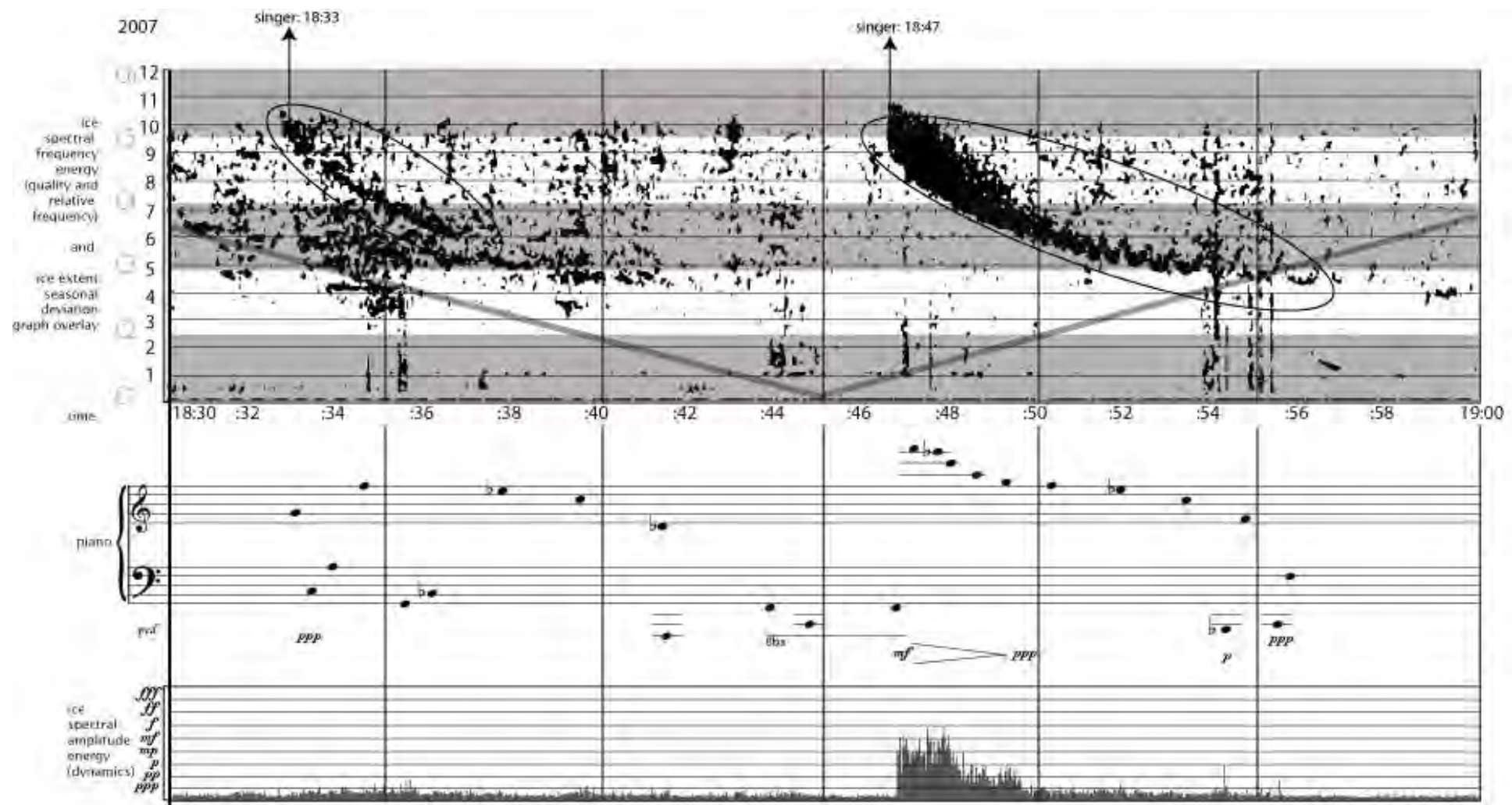




1986

singer: 8:19







Syntax of Snow (2010)



1

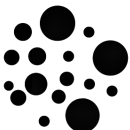
1


2




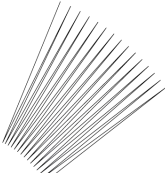
Syntax of Snow - Note/Gesture Lexicon

C 
touch lightly


E 
fingers tapping

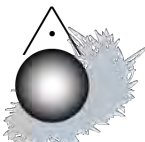
Ab 
crush in hand

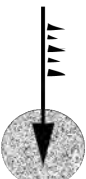
Db 
with closed fist


F 
sift through fingers


A 
pat with open palm


D 
draw line

F# 
resonant thump

Bb 
drop handful

Eb 
press on surface

G 
swish with palm

B 
flick with fingernail

3

p *pp* *p* *mp* *sfz* *mp* *p* *pp* *pp* *p* *mp*

This system contains 11 measures. The first measure has a dynamic marking of *p*. The second measure has *pp*. The third measure has *p*. The fourth measure has *mp*. The fifth measure has *sfz* and is highlighted with a grey vertical bar. The sixth measure has *mp*. The seventh measure has *p*. The eighth measure has *pp*. The ninth measure has *pp*. The tenth measure has *p*. The eleventh measure has *mp*.

Below the staff are two rows of visual icons. The top row contains: a sphere with a triangle on top, a spiral, two vertical lines, two vertical lines, a teardrop shape with a grid, a teardrop shape with a grid, a cluster of black dots, a grey triangle, a spiral, a fan of lines, and a spiral. The bottom row contains: a circle with a dot, a circle with a dot and a curved line, a circle with a dot and a curved line, a circle with a dot and a curved line, a circle with a dot, a circle with a dot, a circle with a dot and a curved line, a circle with a dot, a circle with a dot, a circle with a dot and a curved line, a circle with a dot and a curved line, and a circle with a dot.

4

sfz *mp* *p* *mp* *sfz* *mp* *p* *pp* *p* *pp* *p* *pp* *pp*

This system contains 14 measures. The first measure has a dynamic marking of *sfz* and is highlighted with a grey vertical bar. The second measure has *mp*. The third measure has *p*. The fourth measure has *mp*. The fifth measure has *sfz* and is highlighted with a grey vertical bar. The sixth measure has *mp*. The seventh measure has *p*. The eighth measure has *pp*. The ninth measure has *p*. The tenth measure has *pp*. The eleventh measure has *p*. The twelfth measure has *pp*. The thirteenth measure has *pp*. The fourteenth measure has *pp*.






Below the staff are two rows of visual icons. The top row contains: a sphere with a triangle on top, a sphere with a triangle on top, a teardrop shape with a grid, a teardrop shape with a grid, a fan of lines, a cluster of black dots, a cluster of black dots, a fan of lines, a cluster of black dots, a fan of lines, a cluster of black dots, and a cluster of black dots. The bottom row contains: a circle with a dot, a circle with a dot, a circle with a dot and a curved line, a circle with a dot and a curved line, a circle with a dot and a curved line, a circle with a dot and a curved line, a circle with a dot and a curved line, a circle with a dot and a curved line, a circle with a dot and a curved line, a circle with a dot and a curved line, a circle with a dot and a curved line, a circle with a dot and a curved line, a circle with a dot and a curved line, and a circle with a dot and a curved line.

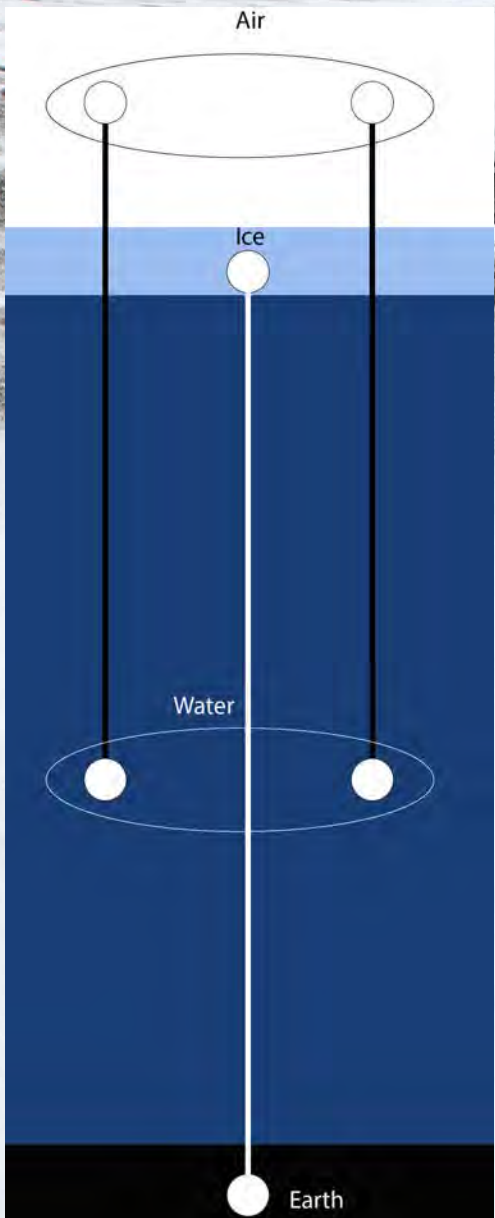


Beaufort Lagoons Ecosystem (BLE)
Long Term Ecological Research (LTER)

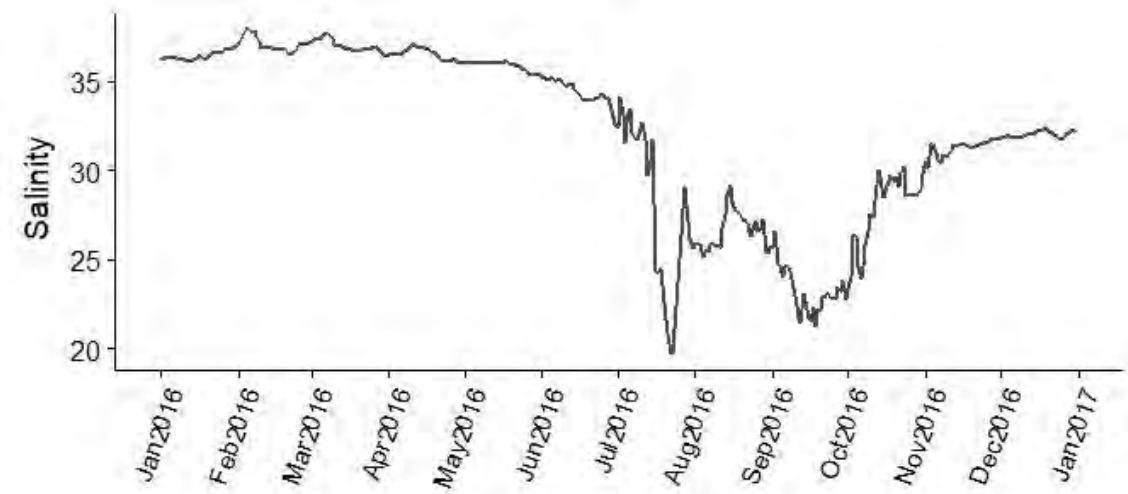
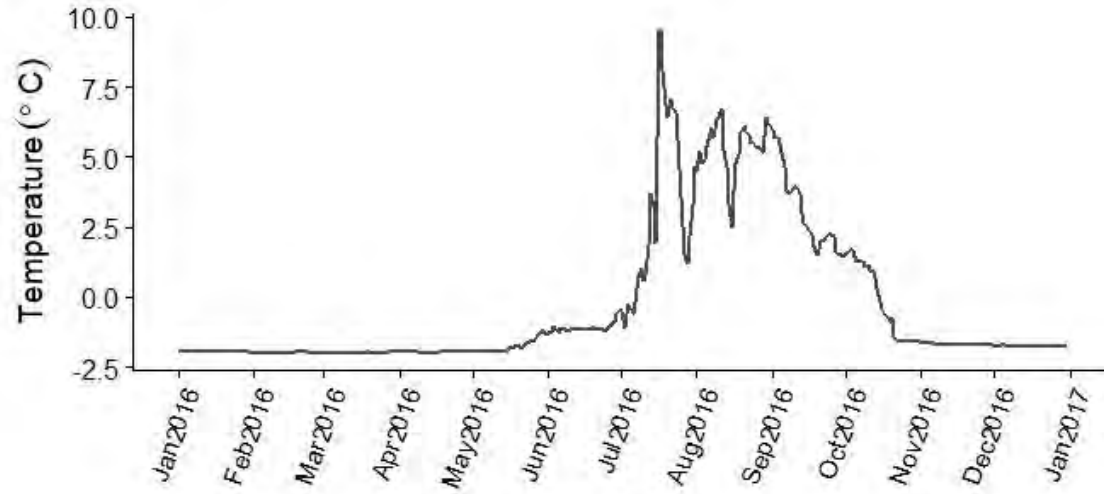
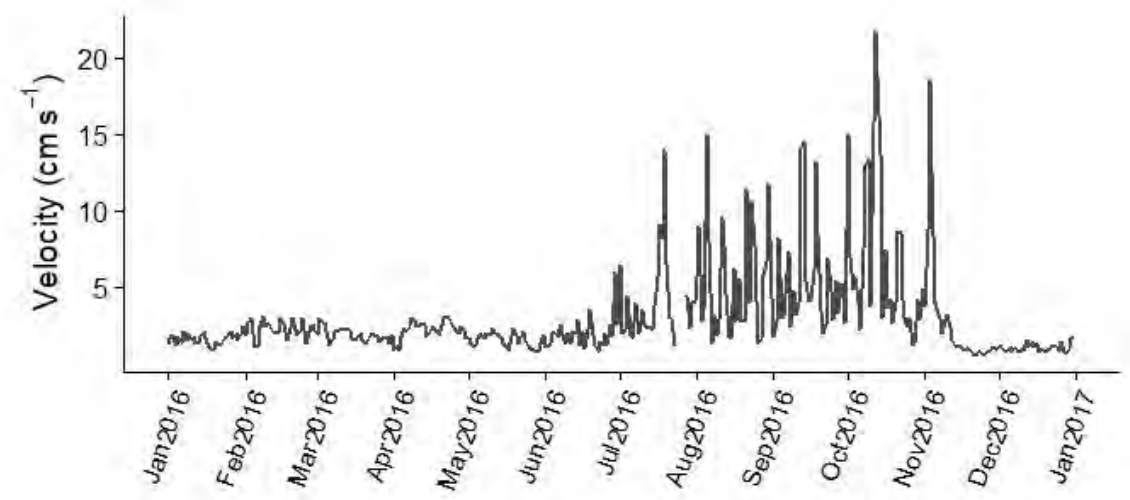
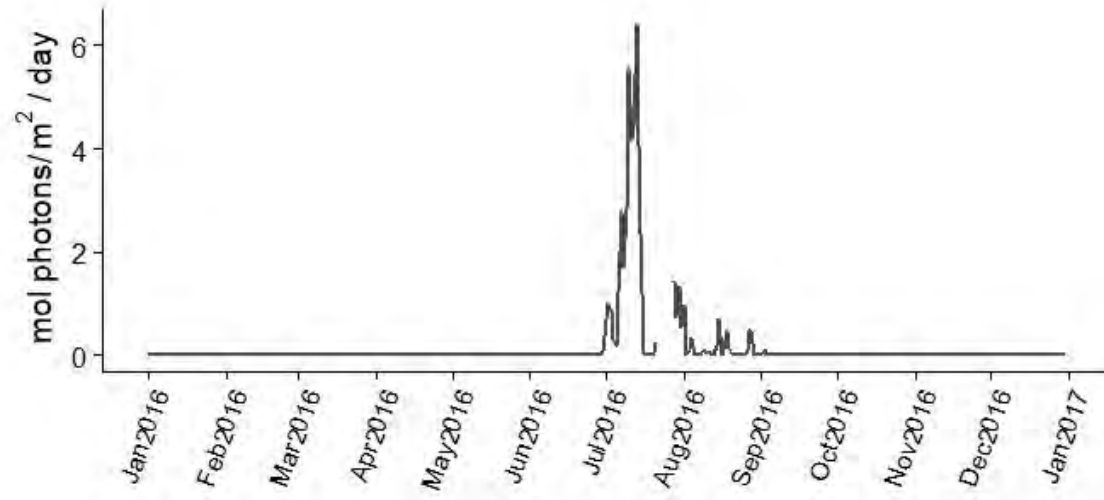


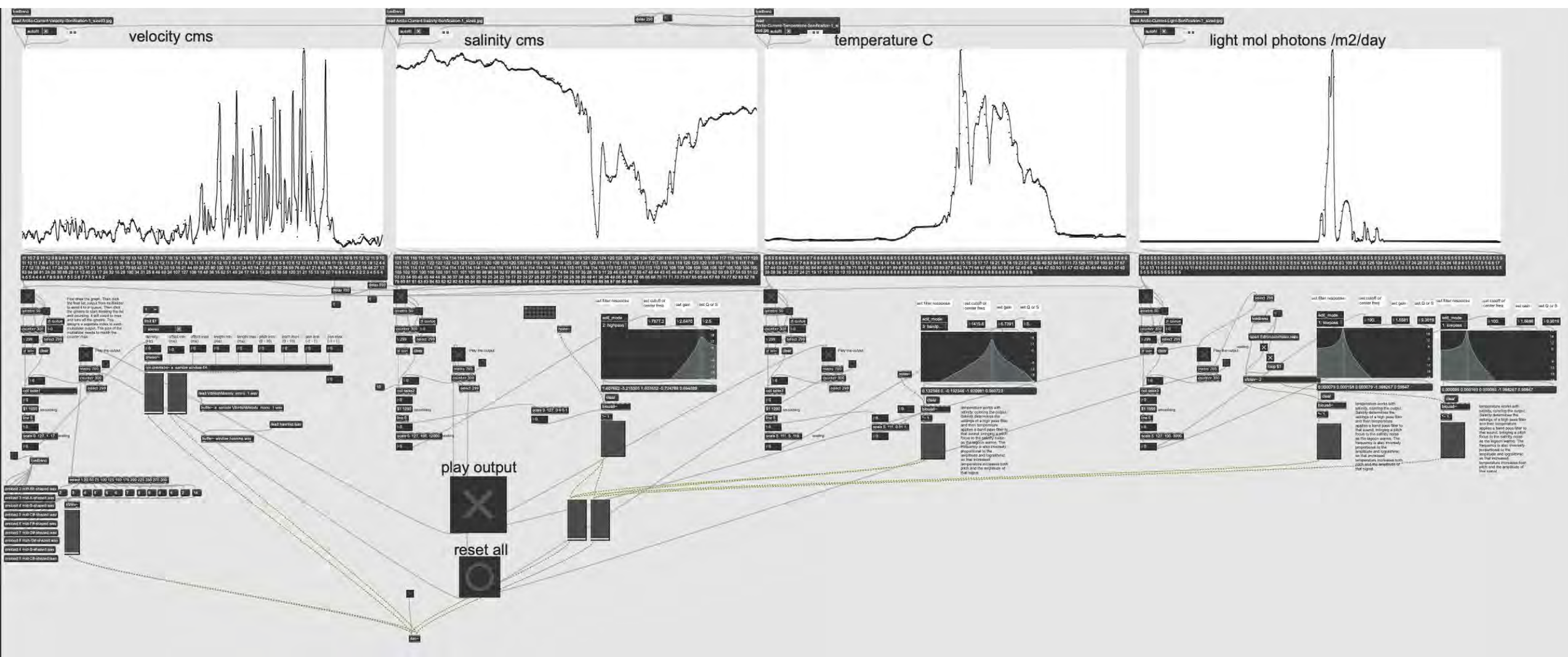


-  all mics
-  air
-  ice
-  water
-  sediment

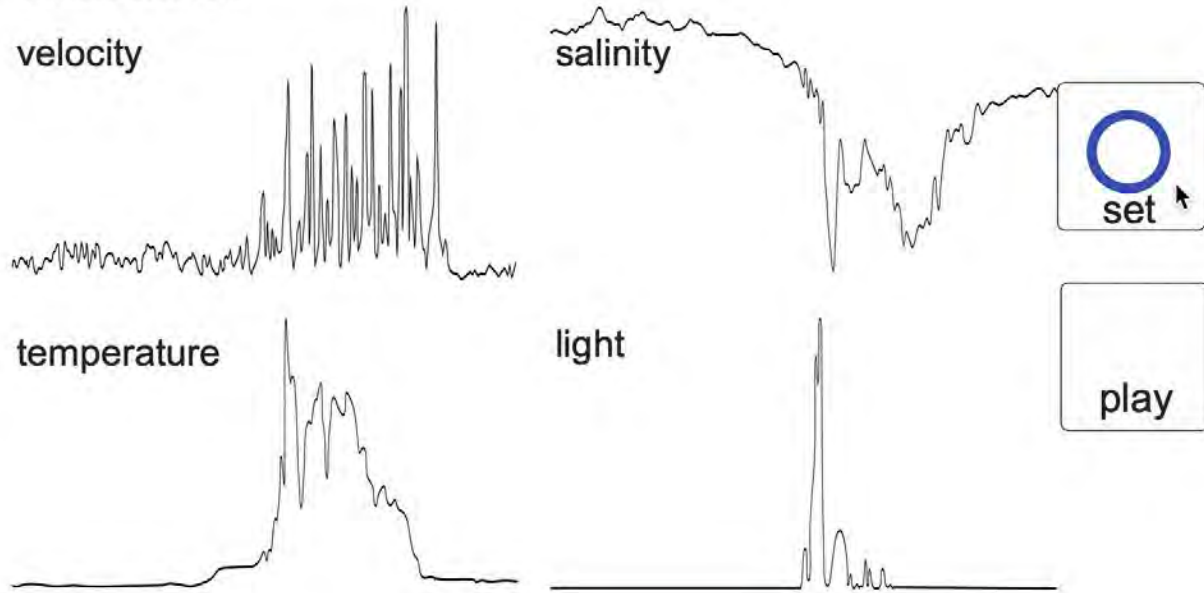


BLE LTER Stefansson sound deep 2 (Prudoh Bay East 1)





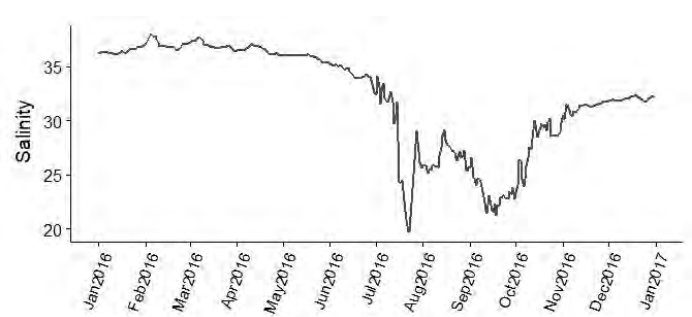
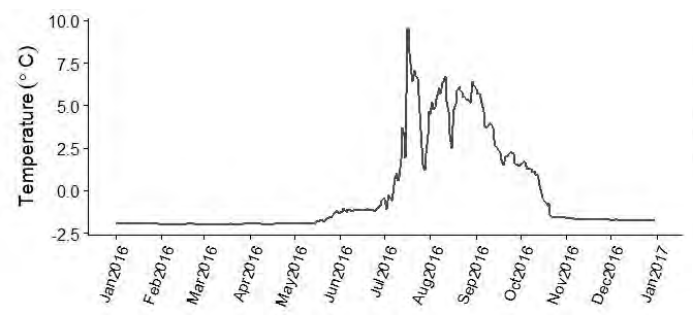
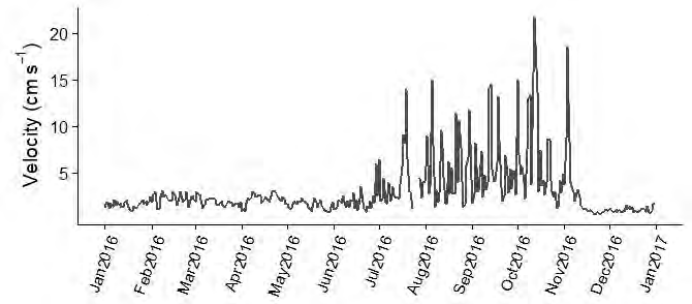
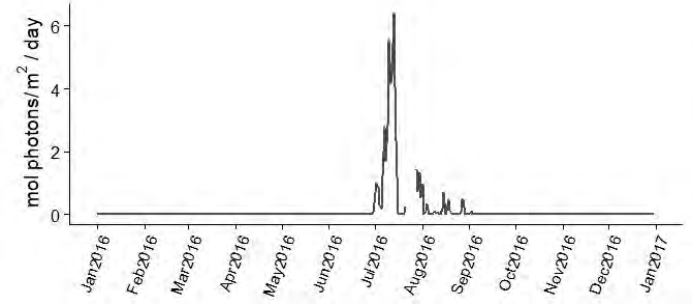
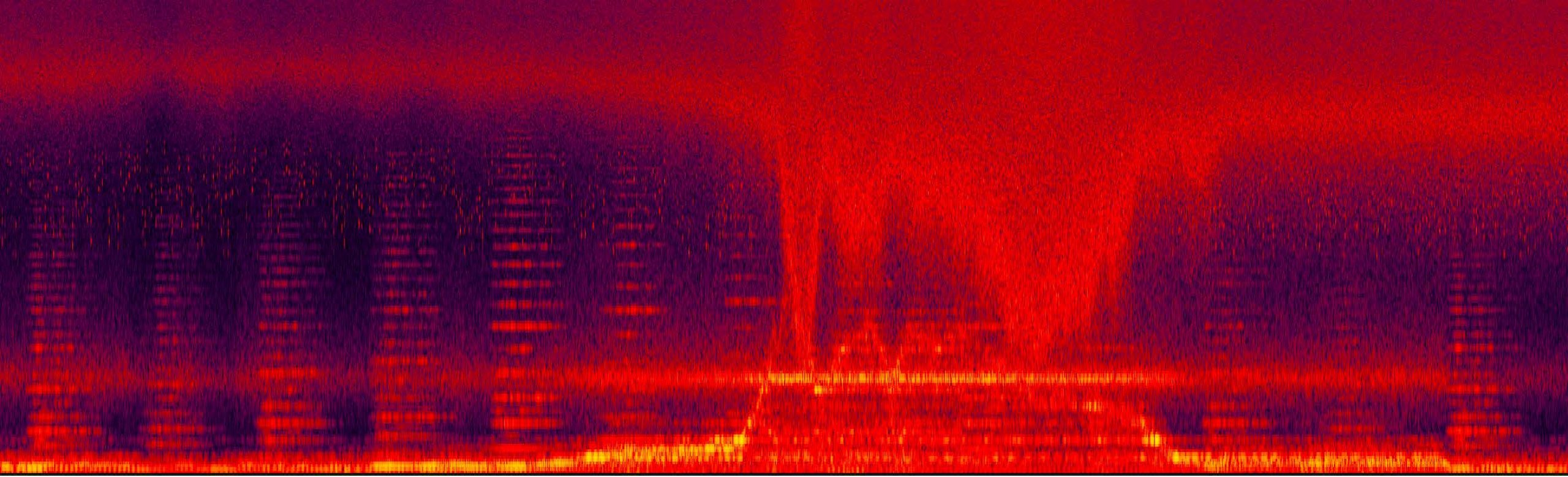
Arctic Sonification: Beaufort Lagoon Ecosystems #1
Matthew Burtner, 2020

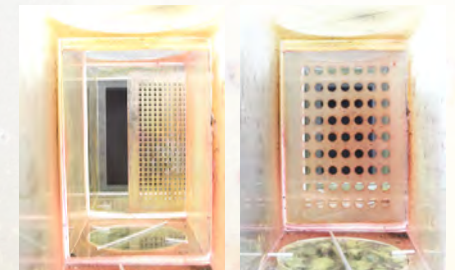


-2.85714 7877.165 5. 100.

January





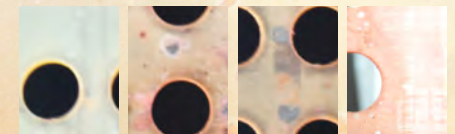


perforation radius=0.125in

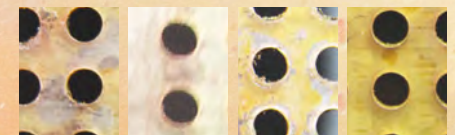
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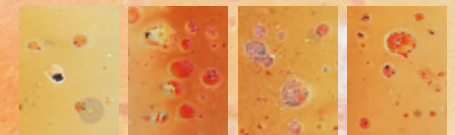
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0.25in

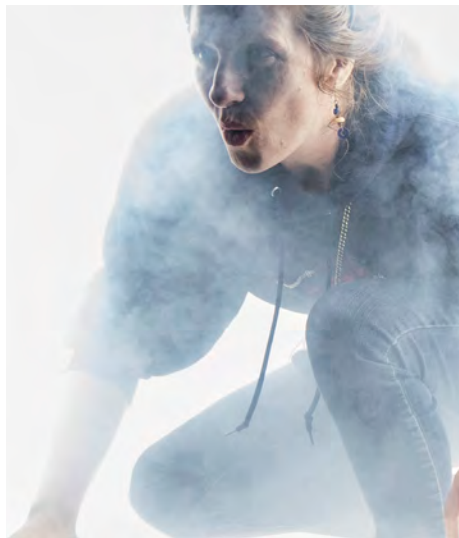


0.125in



0.0in







Arctic Portals: Ice Cores. ADG w/ Hoagland-Hanson, Gename, Grossman & Pate, 2019.

GROUND IS...

*A GARDEN
A WEB
A MEMBRANE
AN IDENTITY
A RESERVOIR
A HABITAT
AN INSULATION
A RESOURCE
AN OFFERING
A COMMUNITY
A STORY-TELLING
HISTORIES
DATA
MEMORIES
HOME*

*IMPRINTED
MANIPULATED
SHARED
INTERPRETED
DETECTED
REVEALED
ENMESHED
SPOILED
HARVESTED
INTERCONNECTED
FRAGMENTED
ASSEMBLED
RECIPROCAL
FERTILE
SYMBIOTIC*

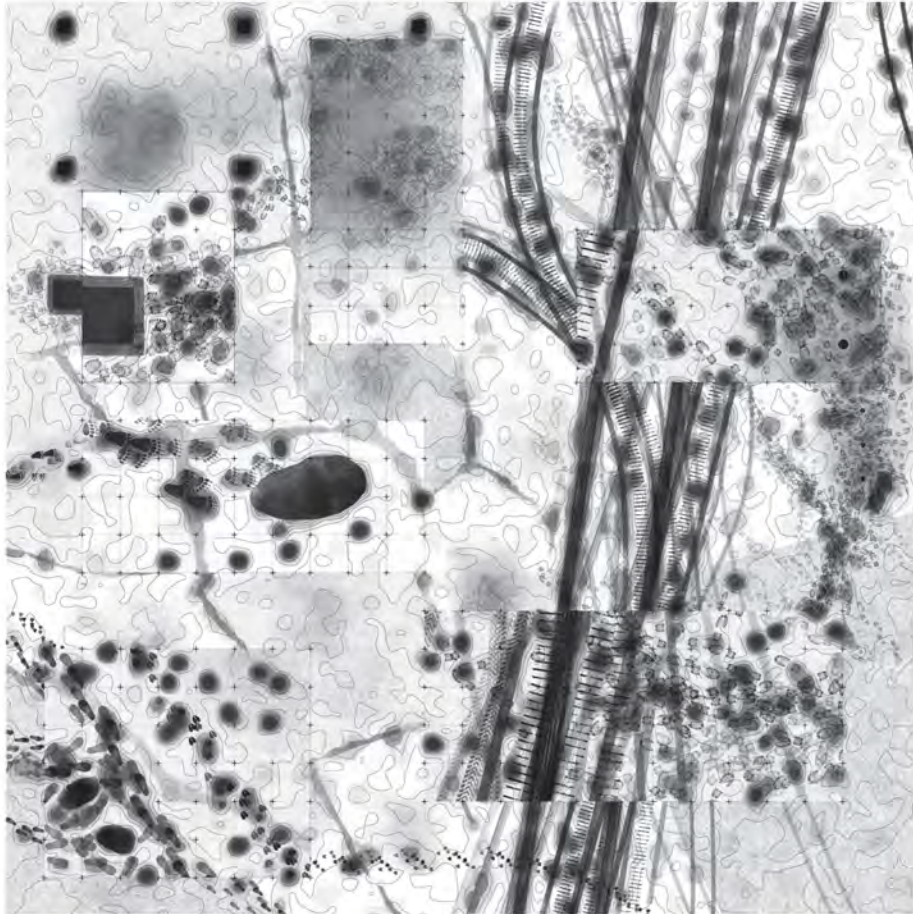
*GROWING
GIVING
LIVING
ENRICHING
FLUCTUATING
REGENERATING
TRANSFORMING
SENSING
RECORDING
ACCUMULATING
VIBRANT
TOLERANT
REMOVABLE
THICK
HETEROGENEOUS*

...

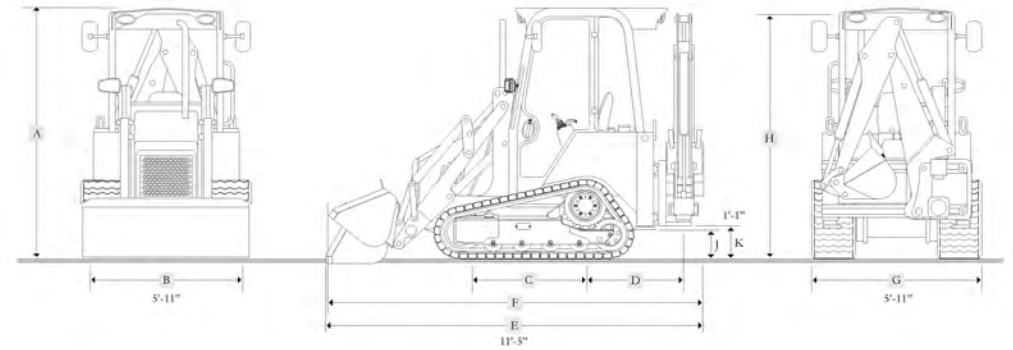


ADG Utqiagvik Studio (via Anchorage & Fairbanks), 2020.

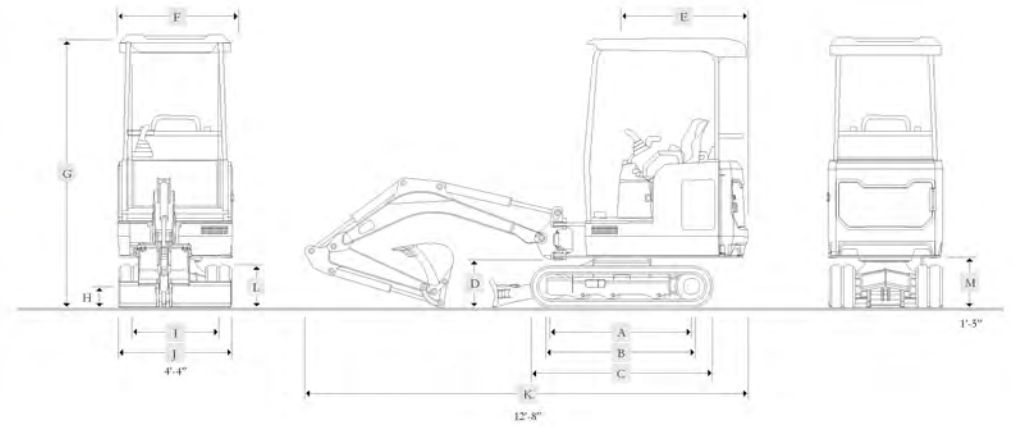
GROUND IS...



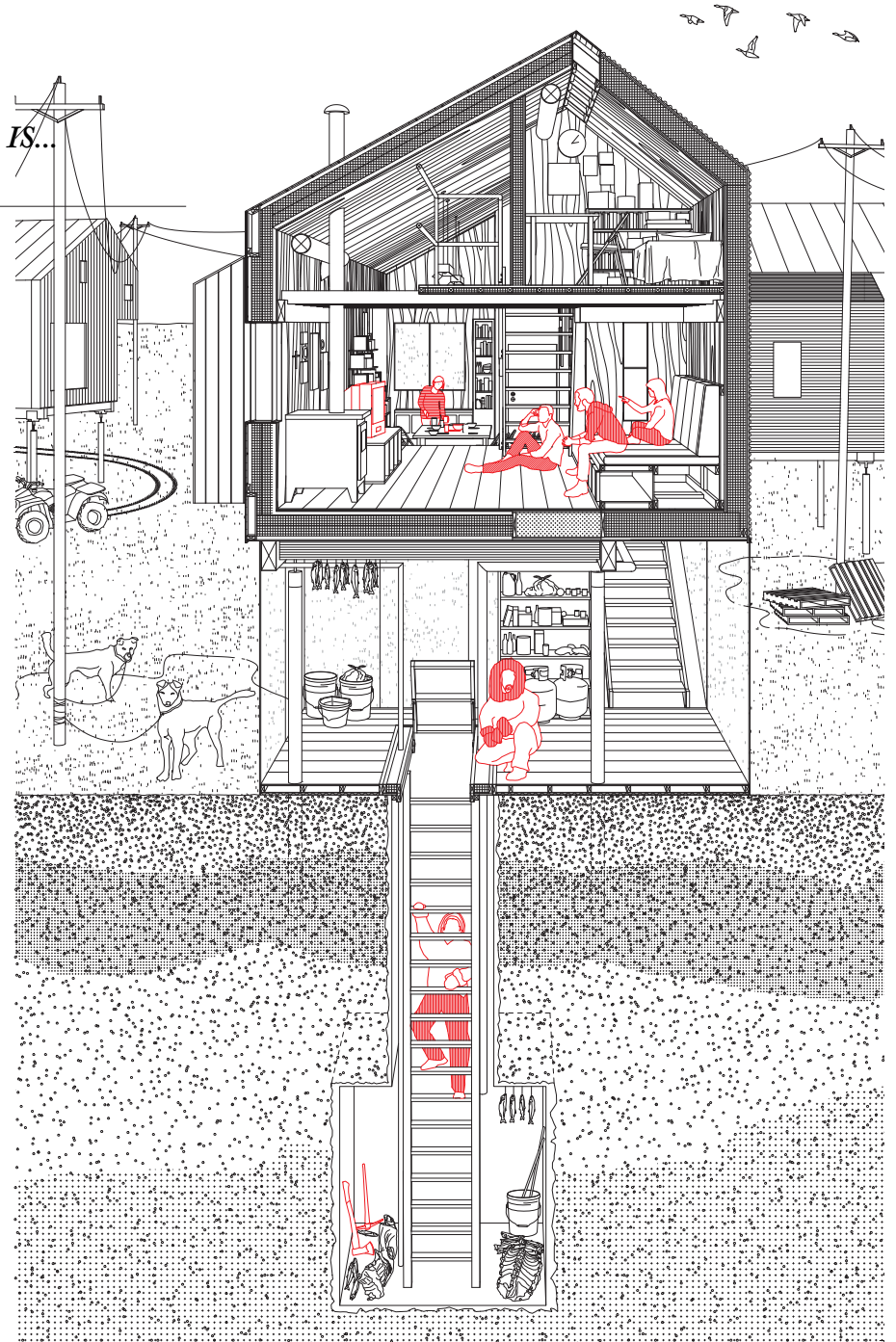
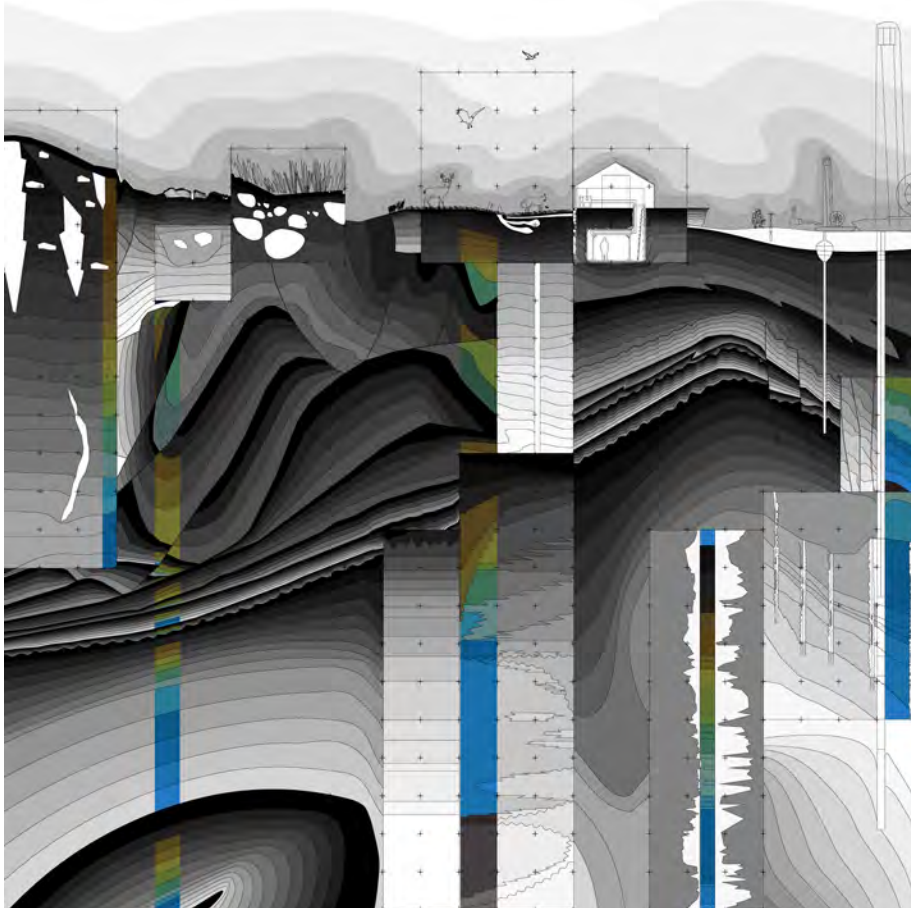
BACKHOE



EXCAVATOR



GROUND IS...







"Patterned Ground"

Porcelain polygon ice wedges and black sand
16 x 10 feet

A Quick & Tragic Thaw

Gabrielle Russomagno

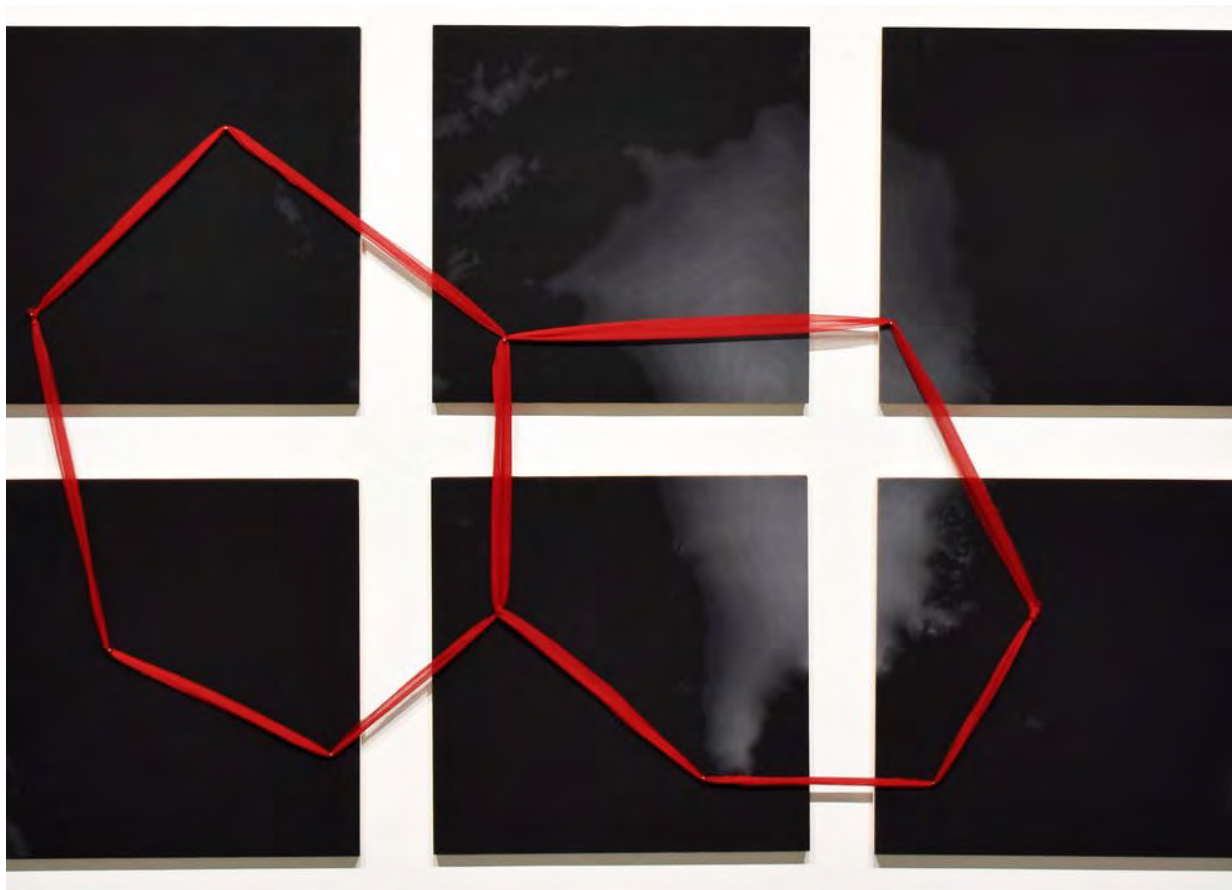
Arcus Webinar, September 21, 2020

Patterned Ground

Porcelain polygon ice wedges and black sand. (A future possibility?)

Map content: Greenland.



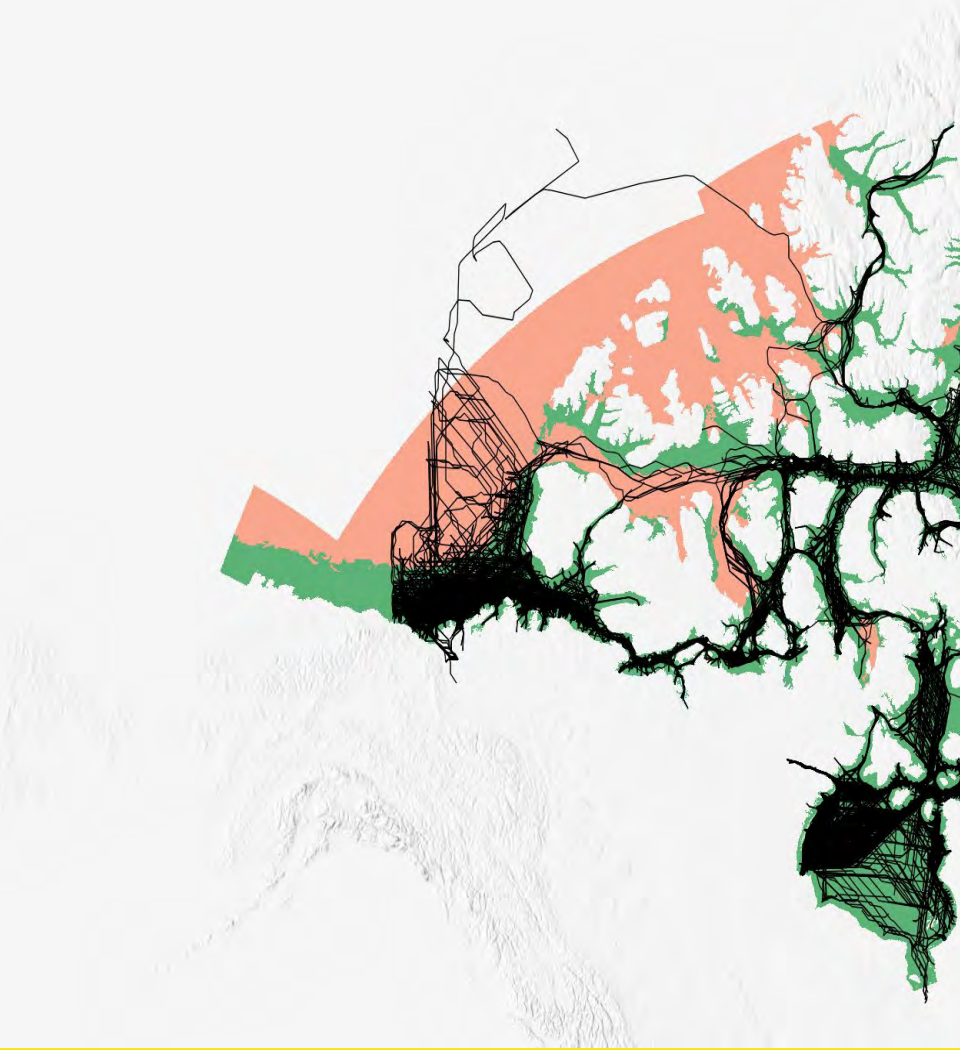
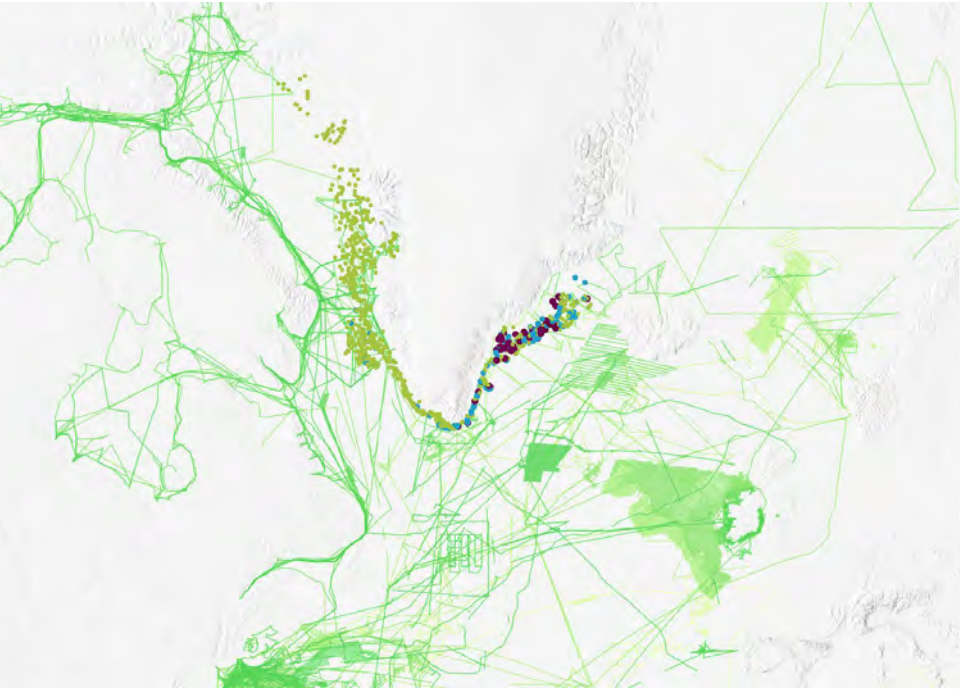


Plastic Projections

Archival digital printing of maps created in arcGIS and arcticDEM on recycled plastic, heat melted and shaped.

The content includes data sets that reflect the arctic region today, along with future projections and change over time to precipitation, wind patterns, ice melt, biodiversity, areas of ecological and biological significance, and migratory patterns. Resource extraction, industrial loss and development, marine traffic, potential shipping routes, military bases, purchasing power and population distribution are also included in the data.





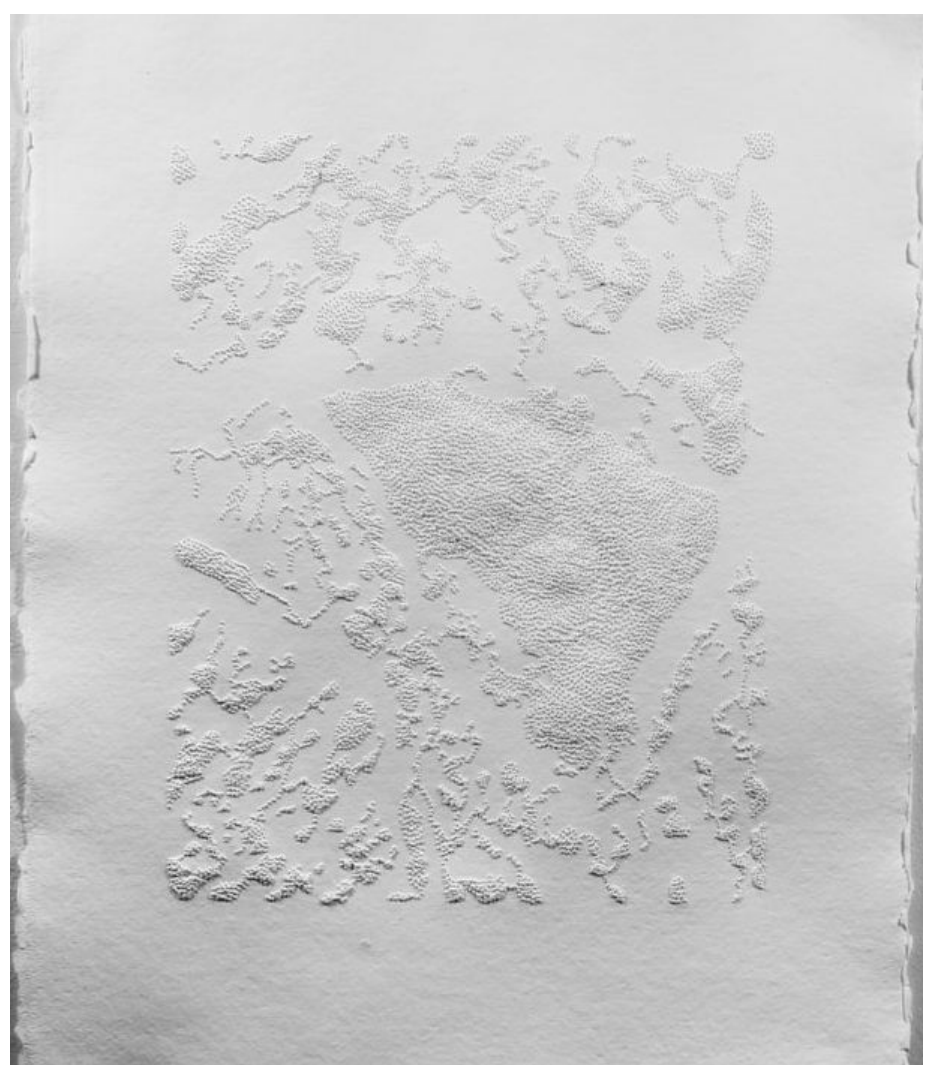
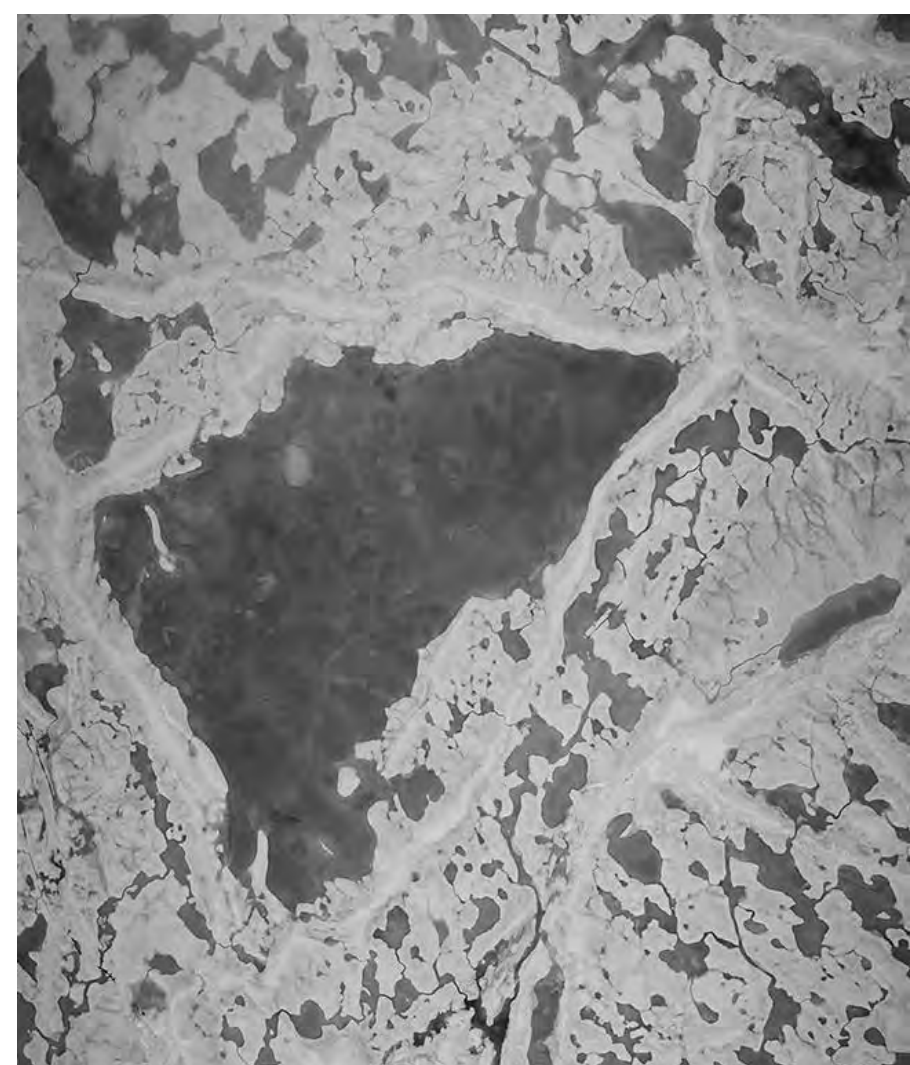


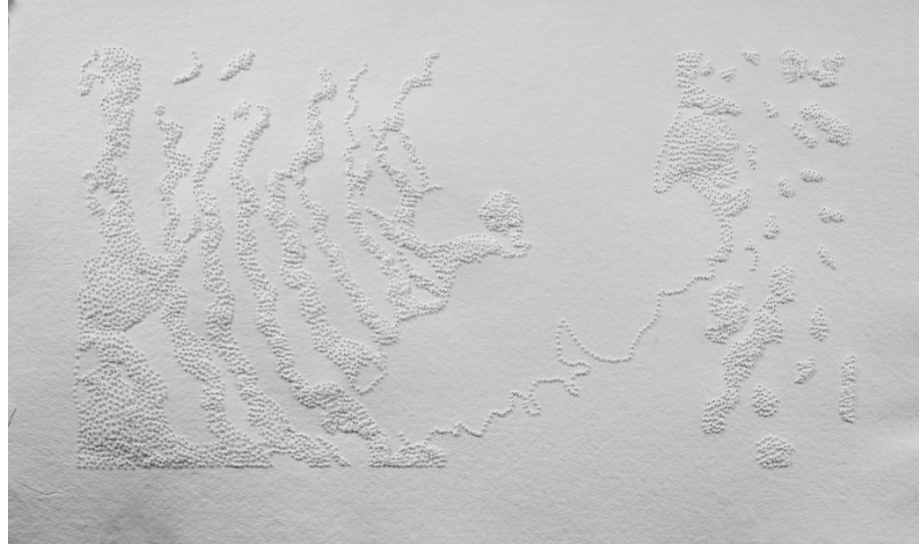
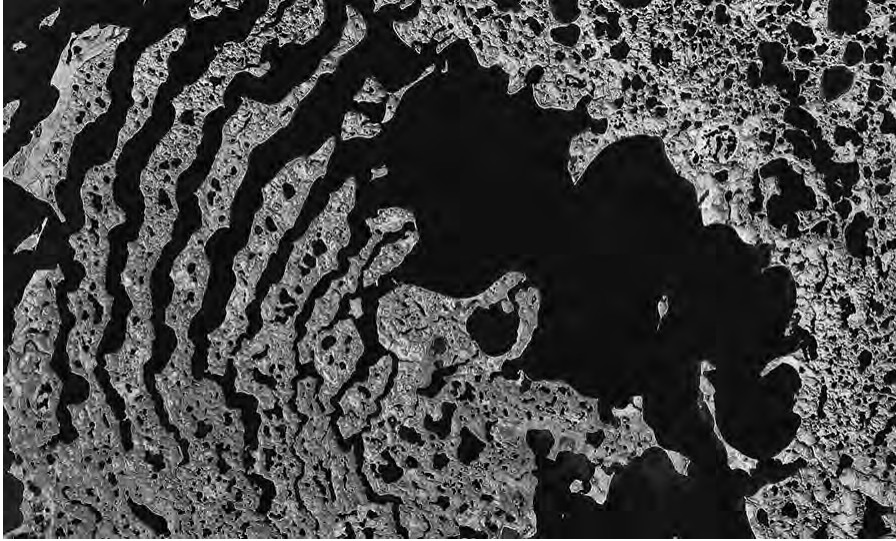
Transfer and Pierce

Archival digital printing of maps created in arcGIS and arcticDEM on recycled plastic, heat melted and shaped.

The content includes data sets that reflect the arctic region today, along with future projections and change over time to precipitation, wind patterns, ice melt, biodiversity, areas of ecological and biological significance, and migratory patterns. Resource extraction, industrial loss and development, marine traffic, potential shipping routes, military bases, purchasing power and population distribution are also included in the data.







Elements and Collections

Graphite ingot, copper, plaster, and carbon.

Inlaid ingot content includes renderings of landmass on the northern coast of Alaska and the Canadian Arctic Archipelago.

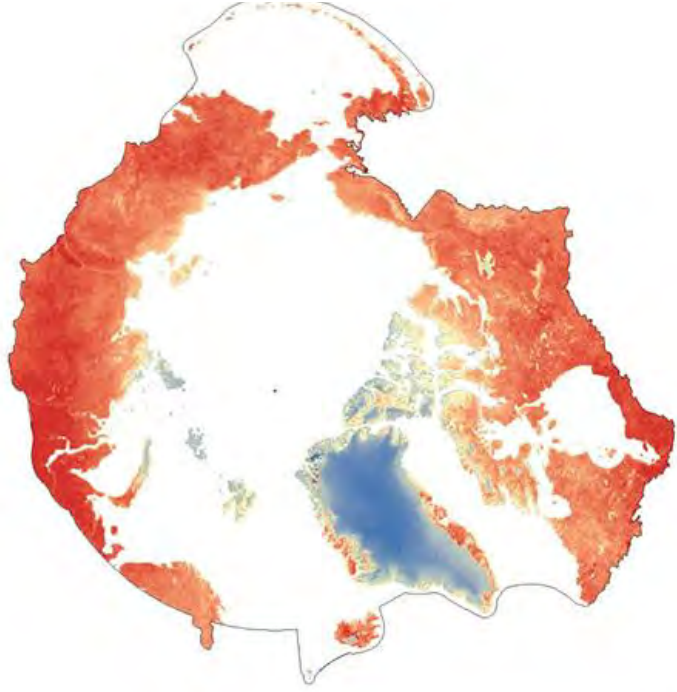
Stamped plaster elements includes the effects of climate change on migration of birds (Barn Swallows, Solitary Sandpiper, Mississippi Kite, human-spurred evolution, Inuit words for ice, names of hurricanes (10 hurricanes in 10 weeks 2017), and excerpts from conversations with Howard Epstein, Phd, Professor of Environmental Science, UVA.





Source: Earthstar Geographic | Source: Eri, GERIC, NOAA, National Geographic, Del.ornis, HERE, Copernicus, and other contributors | Source



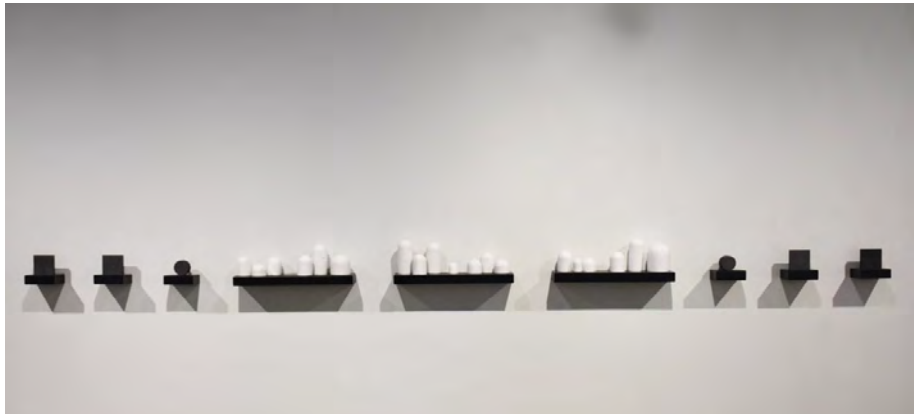


Land Surface Temperature
1 Jul 2013

4 000 Km 3 000 1 000 0

Landusectemp





Websites

www.russomagno.com

www.theircollaborative.com

[PDF of the catalog for Quick and Tragic Thaw](#)

Email

russomagno@gmail.com

I would love to work with or connect with you!