

# Ecotechnologies of Practice: in-forming changing climates

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## Abstract

How do ecotechnologies of practice actualize? This paper traces the material/theoretical operations of an ongoing research-creation concerned with changing climates. It mixes information in experimental approaches from collectivities of trees, media arts and forest sciences. Through individuations of symbiotic modulations, the paper is a thinking-with Balsam Fir, Diana Beresford-Kroeger, Camera, Domingo Cisneros, Dendrometer, Erin Manning, Isabelle Stengers, Jack Pine, Gilbert Simondon, Light Emitting Diodes, Numbers, Microphone, Recorder, Sapflow, Sensings, Speakers, Sugar Maple, Temperature, Yellow Birch.

## Keywords

Research-creation, changing climates, trees, ecotechnologies of practice, information, individuation, art/sci/phi.

## DOI

10.69564/ISEA2023-33-short-Trudel-Ecotechnologies-of-Practice



Figure 1. November 2020. Out in the field at the Smartforests Canada research site (Sainte-Émélie-de-l'Énergie, Québec). L to R: Ælab (Gisèle Trudel and Stéphane Claude) and forest engineer Christoforos Pappas. Photo: Zoé Fauvel.



Figure 2. May 2021. Tree and machine sensings at Station biologique des Laurentides, Saint-Hippolyte, Québec. Oxygen and CO2 in-form the living for millennia. Photo: Gisèle Trudel.

## Differential interdependence

An interdisciplinary sharing is at work. Ælab joins forest engineer Christoforos Pappas who is explaining to them how to attach a sapflow sensor to a tree in the boreal forest (Figure 1). The tree already senses with the surroundings, the sapflow sensor brings the tree's operations into human understandings, as sociologist Jennifer Gabrys has discussed.<sup>1</sup> Inter-cross-transdisciplinary approaches activate philosopher Isabelle Stengers' concept of "ecologies of practice" in modern science.<sup>2</sup> To move outward of disciplinary silos, she states openness is required while still maintaining tension, to question how practices produce knowledges (plural added; *savoirs* in French). Stengers argues for knowledges production in interdependence, within the practices of each scientific field, and in-between them. Each field can contribute a differential worldview to one another, a distinguishing plurality.

Scientific fields work actively to try to solve climate changes. Yet, what else can occur in-between the sciences, trees, art and machines? There is an important increase of sensual and affective artistic explorations with trees, among others by Jane Tingley, Domingo Cisneros, Susan Turcot, Rasa Smite and Raitis Smits, Agnes Meyer-Brandis. In this research-creation project, scientific and tree knowledges are expressed in outdoor media art installations. How can knowledges and practices resonate together, within and through a multitude of fields, given the concerns for the "more-than of life-living" of the blue planet?<sup>3</sup>

## Experimental in-forming

The concepts of information and individuation offered by Gilbert Simondon provide insight for the encounter of ecologies of practices.<sup>4</sup> In his philosophy, information is more-than what is generally considered as factual data. Information is operation. It activates change through perturbation, by provoking or inducing an encounter between disparate elements/factors, as event. Potential is propelled into actualization through a dynamic play of forces. This is of particular importance in the context of climate change where fearful and helpless affects predominantly circulate. How else does change occur?



Figure 3. Ælab, bois eau métal, July 2021. Outdoor media art installation with sound, LED tiles, scaffolding, weather kit. Espace pour la vie - Jardin botanique de Montréal. Photo: Richard-Max Tremblay.

The first outdoor media installation by MÉDIANE to explore the potential of changing climates is *bois eau métal* (2021), an artwork concerned with the ecophysiology of three trees, with numerical data from Smartforests Canada research site, including immediate weather sensing. Presented in the Arboretum, the

scaffolding structures are a site of temporary co-constructions (*chantier*), mini pavilions without walls for experiencing three types of immersive sounds setups, video imagery and graphic visualizations. Tree data from a forest is co-composed with colors from a custom-made weather kit. The whole manifests as rhythms of physical processes in feedback loops. This installation acts as information, pushing the exploratory differential encounters between fields of knowledges and experiences in a shared reality with trees. Stengers analyzed science domains which often perpetuate their own methods of safeguarding knowledges production. Contemporary art often relies on the unwavering codes of modernist heritage to produce and present artwork as autopoiesis, production of self “in and of itself”. To promote changes, in Stengers' words, “this is the reason why, through the exploration of knowledges, there is also a type of ethical experimentation” (our translation).<sup>5</sup> Respecting and challenging, one and other. Shifts occur, along with the tree's own experience; despite the tree being rooted in one location, seemingly *immobile*, the sensor data shows the tree is constantly moving and changing at microscales.



Figure 4. *Ælab, bois eau métal*, July 2021. Outdoor media art installation with sound, LED tiles, scaffolding, weather kit. Espace pour la vie - Jardin botanique de Montréal. Publics are invited to participate in semi-directed interviews, engaging with their experience of the artwork. The analysis of these interviews influences the production of the following installations in the iterative series. Photo: Caroline Pierret.

Changing climates warrant to be addressed as a “problem” *in* and *of* change, within research fields and in their differential gathering, and in dialogue with diverse publics. How can ecotechnologies of practice address the problem of changing climates, understood here as an obstacle for thought in and into action, rooted generally in fear, anxiety and helplessness? This is an obstacle needing new thought, a coproduction of knowledges in practice, in experience. Stengers and Simondon provide compelling offerings to think-with and act-with problems, in experimentation. In Simondon's

concept of individuation, no individual (human, instrument or otherwise) preexists to the encounter. Individuation occurs through the meeting of forces, garnered little-by-little and in proximity, gatherings that build and change in time. Propelled into change by the perturbation of information, triggered by the tree's mode of living, change happens. For better or for worse, without moral imperative, it is a propositional ongoing, a doing, building with each tiny difference.<sup>6</sup> This approach is core to MÉDIANE's ongoing research-creation process, whereby each installation proposes change, building with the tree, data gathering, analysis, and by the gradual spreading of knowledges production and circulation in-between trees, forest science, out-of-doors art and publics.

## An orientation, not a beginning

The slogans of the FridaysForFuture global strike movement (FFF) repeat that governments, corporations and publics need “to listen to the science, to listen to the scientists.”<sup>7</sup> Scientists are directly convened to address climate change, outside of the silos of fundamental knowledges production. Undeniably, scientists are needed and respected to do so. However, it points to the domination of science as holding exclusivity to resolve climate emergencies. Peoples (plural) have perhaps given over climate change issues to science and to government to solve, forfeiting distributed agencies. How can a combination of practices contribute to new actions? With Stengers, it becomes possible to extend the ecologies of practices in scientific realms to a mixing of approaches by *ways* of practice, in-between collectivities. A new knowledges circulation, a thinking-with trees, machines, materialities, artists, scientists and publics, even if only temporarily. This problem for thought in/to action, perturbed by climate changes, is addressed by ecotechnologies of practice. In Figures 5 and 6, the 2022 media installation entitled *Orée des bois* addressed these questions through the study of the birch tree's phenology, the seasonal changes from Spring to Fall which affect growth and connections with flora and fauna.





Figure 5. *Ælab, orée des bois*, June 2022. Outdoor media art installation with sound, LED tiles, scaffolding, weather kit. Presented at Jardin du Coeur des sciences, UQAM. In this instance of the installation, an arch was created between triangular plots of land, community city gardens. The scaffolding is a physical drawing vibrating in spacetime with a multitude of experiences. Publics circulated between and under the structures, traversing the site to another zone with scaffolding tables of different heights. Additional activities onsite included workshops and presentations about medicinal plants, sensory ethnography, cartography, performances, conversations with drawings on birch bark, etc. Photo: Alexis Bellavance.



Figure 6. (detail). *Ælab, orée des bois*, June 2022. Outdoor media art installation with sound, LED tiles, scaffolding, weather kit. The project focused on the Spring to Fall seasons of a birch tree through alterations of time-lapse sequences of photographs of the tree from camera placed directly on the tree, mixed with visualizations of inner workings (on left). The slits between the LED tiles accentuates embeddedness in physical site's activities, along with rain, wind, city noise, etc. Photo: Alexis Bellavance.

## A problem of & with & in practice

For Stengers, ecology is always double: scientific *and* political (italics added).<sup>8</sup> This doubling can be activated in contemporary art, design and well as social sciences, charting the trajectories of actants. In Greek, *technè* is art, skill, and craft or the method employed resulting in an object.<sup>9</sup> *Logos* tries to lay claim to (human) language, to “collect, gather, in derivatives of word, speech, statement, discourse, computation, account.”<sup>10</sup> To consider technology only in a prepotent human way provides humans with vector to dominate and control, to justify the means to an end, often neglecting entangled elements/lives/factors. Technology understood in this dominant way severely limits approaches, because if it is seated only in the human as an exclusive semiotic rationality, it prevents or even opposes new informations to coalesce or collide with more-than and other-than. It is pertinent to note that in sustainable architecture, a definition for ecotechnologies is holistic systems or machines with the environment, including reuse, passive housing, renewable energies, cradle-to-cradle designs.<sup>11</sup>

Simondon proposes another technology, neither thing nor method fashioned by human will. In his philosophy, individuation is actualized through “phases” of relations between physical environments, instruments and humans. Technology is in-forming, changing, extending another expression of *logos*, the cosmos expressing its manifold in movement with animals, minerals, plants<sup>12</sup>. A “life-living.”<sup>13</sup> It is also the combined strengths of trees, scientists, artists and publics in changing climates.

This ongoing research-creation proposes ecotechnologies of practice in a *crafting* of “response-abilities.”<sup>14</sup> The tree *crafts* problem-solving operations with the surroundings: tackling water preservation or evapotranspiration as needed, regulating sap flow, making clouds, coordinating burgeoning and senescence timings, going dormant in northern winters, turning sapflow into antifreeze to prevent embolisms.<sup>15</sup> Furthermore, trees produce photosynthesis in a cosmic relation of sun and soil, they yield oxygen and even grow stronger and bigger with the extraction of carbon dioxide from the atmosphere.<sup>16</sup> They communicate through VOCs (volatile organic compounds) and mycelium networks.<sup>17</sup> These are but a few of the tree's wondrous techniques, parts of a larger continuum to coevolve their technologies over 350 million years.<sup>18</sup> To partake gently in their knowledges, Indigenous artist Domingo Cisneros proposes eating and drinking parts of coniferous trees without harming the plant, a celebration to share in the strength of the longevity of their problem-solving techniques.<sup>19</sup>



Figure 7. Ælab and CREAM. *Les trois frères* (2020). Documentary concerned with forest gastronomy of the “three brothers”: spruce, fir and cedar. L to R: Stéphane Claude, Domingo Cisneros, Antoinette de Robien. Photo: Gisèle Trudel.

In a similar celebratory fashion, medical biochemist, botanist, climate activist and author Diana Beresford-Kroeger is as adamant as she is hopeful in times of changing climates. Her “Bioplan” makes simple statements. She advocates to protect trees in the immediate vicinity as well as native forests in local communities.<sup>20</sup> So efficient, it’s *alarming*. Her approach changes the habitual urgent call associated with resiliency and adaptation of diverse communities that are foregrounded through catastrophic discourse. Change—with life-living trees—is summoned as operation. As Stenger states, consensus is stasis, refusing (to) change. Beresford-Kroeger’s bioplan extends symbiotic intimacy with tree technologies.

## Ongoing Doings

Ecotechnologies of practice entail a perturbation in the habitual conception of the relation of ecology and technology, explored here as operative *process*. The tree’s ecological practice, in conjunction with that of arts and sciences, investigates changing climates with creative problem-solving in dialogue with publics. The differential fields of knowledges bring new expression by their combination, a strength emerging in-between, pushing forth modular alliances. Crafting changes is ecotechnologies of practice: even if ephemeral, potential is actualized through encounters, soliciting variation and individuating collectivities.

## Acknowledgements

The research-creation is conducted on the unceded lands of the Kanien’kehá ka Nation. The MÉDIANE team gratefully acknowledges funding from SSHRC, CFI, FRQSC and support from Hexagram-UQAM.

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## Author Biography

Gisèle Trudel and Stéphane Claude founded the experimental documentary artist research unit Ælab in 1996 ([aelab.com](http://aelab.com)). Collectivities actualize the potential of MÉDIANE (2020-2025, [mediane.uqam.ca](http://mediane.uqam.ca)).