From the Ground Up:

Regenerative Farming, Living Soils, and the *Climate Intervention We Are Missing*

A call to the composting industry, municipal governments, academic institutions, and NGO practitioners to recognize regenerative farming and living soils as a priority climate response, and to act accordingly.

Living Soils: What Is at Stake

Living Soils sits at the intersection of waste systems, soil science, and climate policy, a space that is currently fragmented across sectors and underdeveloped as a coordinated intervention. Addressing it means addressing all three simultaneously.

Climate Mitigation

Carbon sequestration, water retention, emissions offset

Circular Economy

Organics → soil: completing the biological cycle

Food Resilience

Reduced chemical dependency, improved yields

Biodiversity

Restoring the microbial and fungal systems soil depends on

The Case in Brief

Soil is not a growing medium. It is a living system , one of the most biologically complex on Earth. Decades of industrial agriculture have systematically dismantled that system: synthetic fertilizers suppress microbial activity, herbicides and pesticides kill the organisms soil depends on, and tillage breaks apart the fungal networks that hold soil structure together.

The result is a global crisis of soil degradation that drives crop yield decline, water insecurity, and carbon release , while the organic materials that could restore these systems are being treated as waste.

Regenerative farming , grounded in a growing global body of soil science, agroecology, and biogeochemical research, and advanced by generations of farmers, Indigenous land stewards, and practitioners working across diverse

100M acres

targeted for transition to soil health driven farming through the Kiss the Ground / Gabe Brown 100 Million Acres Initiative, a signal of the scale at which regenerative adoption is now being pursued

COP31

Antalya 2026. The immediate policy window for international recognition of soil biology as a climate intervention, within the High Level Climate Champion framework

landscapes and climate zones. Regenerative farming has demonstrated that this damage is reversible. The movement is broader than any single institution or researcher. It spans formal science from organizations such as the Rodale Institute and the work of soil biologists including Elaine Ingham, farmer led innovation pioneered by practitioners like Gabe Brown, public mobilization efforts such as Kiss the Ground, and a wide international research base spanning agroecology, soil carbon science, and ecosystem restoration. Soil can be rebuilt, wherever it is used or applied.

The Foundation: What the Science Tells Us

The Problem

Industrial agriculture has created a chemical dependency cycle: synthetic inputs replace the biological functions that healthy soil performs naturally, while degrading the very biology that makes those functions possible. The consequences extend beyond farming. Degraded soil releases stored carbon, loses its water retention capacity, and fails to support the plant communities that sustain food systems and ecosystems. At the same time, vast volumes of organic material — food waste, agricultural residues, and urban organics — are removed from natural cycles and treated as waste streams, severing the biological loop that can rebuild soil systems. This represents a systemic failure: the very materials required to restore soil are being discarded, underutilized, or processed without biological intent.

The Science

Soil science has long established that soil performance is fundamentally biological, driven by bacteria, fungi, protozoa, and a complex web of organisms that no synthetic input replicates. What regenerative practitioners and researchers have added is the demonstration that these biological properties are measurable, manageable, and reproducible at scale. The work of Elaine Ingham and the Soil Food Web School, alongside laboratory validation from Woods End Laboratories and the Deveron Network, has been particularly significant in translating this science into field applicable protocols and performance based standards.

This work aligns with a broader scientific field spanning soil ecology, agroecology, and biogeochemical research, including contributions from researchers such as Rattan Lal (soil carbon and land restoration), Richard Bardgett (soil biodiversity and ecosystem function), and global institutions including FAO and the IPCC.

The Living Soils Initiative

Living Soils is an applied climate intervention platform built on the scientific foundation of regenerative farming and designed to translate what decades of field research have established into

practical standards, validated demonstration models, and policy engagement at global scale. It is convened by Turning Tides Sustainable Futures Collaborative Society, a cross sector collaborative platform focused on advancing community led, regenerative climate solutions through applied demonstration, partnership, and systems change.

The initiative's central reframe: organic materials are not waste. They are biological resources, the feedstock for soil restoration. When food scraps, agricultural residuals, and urban organics return to the land with biological intent, they complete the natural biocycle that industrial systems have interrupted. This reframes zero waste from diversion metrics to biological system regeneration, where organic materials are not managed but reintegrated into living soil systems that restore ecological function.

The Living Soils Framework: Four Components

Scientific Validation: Biological testing protocols (Woods End Laboratories / Deveron Network) establishing measurable performance standards for living soils products.

Production Standards: A Living Soils Producer Standard providing composting facilities a certification pathway based on biological outcomes.

Demonstration Sites: Real-world pilots underway across agricultural, community, and municipal contexts, from the Salish Sea in the Pacific Northwest to Izmir at the gateway between Europe and Asia, with further demonstration sites in active development.

Cross Sector Convening: Turning Tides as convener, connecting compost operators, farmers, scientists, Indigenous knowledge keepers, municipalities, and climate organizations for learning and adaptation.

The Living Soils Producer Standard and the Four Pillars

The Living Soils Producer Standard is designed to go beyond the regulatory floor established by frameworks such as BC’s Organic Matter Recycling Regulation, which governs the safe production, quality, and land application of compost and biosolids. Where existing regulation ensures safety and responsible management, the Living Soils Standard establishes performance: what biologically active compost actually delivers in the field. Each of the four Living Soils pillars is directly advanced by this shift from compliance to performance.

Climate Mitigation: Biologically active compost sequesters carbon in stable soil organic matter rather than releasing it. A performance standard that requires measurable biological activity creates a direct, auditable link between compost production and carbon outcomes.

Circular Economy: A standard grounded in biological outcomes ensures that organic materials are genuinely reintegrated into living soil systems, not merely diverted from landfill. It closes the loop with intent.

Food Resilience: Consistent, validated biological soil inputs reduce farmer dependence on synthetic inputs and improve yield stability across seasons and soil types. The Standard gives farmers a basis on which to specify and trust what they apply.

Biodiversity: Soil that is measurably alive supports the microbial and fungal networks on which plant diversity, pollinator health, and broader ecosystem function depend. A biological performance standard makes this outcome explicit and verifiable.

One unresolved challenge that any standard must address honestly: contamination. The increasing presence of microplastics, PFAS, and other persistent chemicals in organic waste streams is undermining compost quality and limiting land application in agricultural and urban contexts. The Living Soils Standard will need to engage with this challenge directly, not as a barrier to ambition but as a condition of credibility.

The Composting Industry: The Critical Entry Point

The Current Gap

In most jurisdictions, composting is framed as waste management and sanitation , measured in tonnes diverted, not biological performance delivered. This framing limits investment, constrains market positioning, and systematically undervalues what compost can contribute to soil restoration.

Regenerative farming needs biologically active, consistently performing soil inputs. What the composting market currently supplies is, in most cases, stabilized organic matter, useful but not validated for field performance. Large municipalities across BC and Canada have been engaged in organic waste diversion and land application for decades, supported by organizations such as the Compost Council of Canada, which has advanced the industry for more than thirty years. The Living Soils Initiative builds on this foundation rather than displacing it. Its specific focus is on what remains underdeveloped: biological performance validation, the extension of composting infrastructure to smaller communities and remote regions, and the market and policy connections that would allow compost to function as a living soil input rather than simply a diverted material.

The Strategic Choice

Path A, Reactive: Wait for regulatory or market pressure to force adaptation. Cede leadership of the transition.

Path B, Proactive: Reframe organics processing as biological production. Build the scientific standards, demonstration of value, and cross sector partnerships that position the industry as a climate actor.

Path B does not replace existing systems. It adds a biological performance layer and builds the market relationships with regenerative farming that create demand for it. Agriculture is the system that closes the loop: biological performance is tested in the field, carbon is sequestered in living soils, and value is realized at the farm gate. Without agriculture as an active participant, compost remains a processed material and soil restoration does not scale.

What Each Sector Can Do

Composting Industry

- Engage with biological testing protocols to establish performance baselines
- Participate in Living Soils Producer Standard development
- Identify pilot sites for demonstration and validation

Municipal Governments

- Recognize organic waste as a biological resource in waste and land use policy

Academic Institutions

- Contribute to protocol development and independent validation
- Bridge applied composting practice and soil biology research
- Support longitudinal field studies for the policy evidence base

NGO & Civil Society

- Integrate living soils into food security and food sovereignty efforts

- Develop procurement standards that reward biological performance and support land application, building on the Organic Matter Recycling Regulation framework
- Prioritize capacity building in smaller communities, remote and northern regions, and Indigenous territories, where organics infrastructure remains limited and Living Soils can have the greatest unrealized impact

Agriculture

- Adopt biological soil inputs and participate in Living Soils field validation trials
- Co-develop biological performance standards as the primary market for living soils outputs
- Share field data and farmer knowledge as co-innovators in the development of regenerative systems
- Build public understanding of soil health as a climate, food, and community issue

Indigenous Knowledge Keepers and Land Stewards

- Bring place-based ecological knowledge that has sustained soil and land health across generations, informing what science is now working to measure
- Co-design demonstration sites and Living Soils pilots on Indigenous territories, with self-determined governance over data and outcomes
- Participate as equal partners in the development of the Living Soils Producer Standard and cross sector governance structures

The Global Opportunity: COP31 Antalya 2026

Soil health and land based climate solutions have been consistently underrepresented in international climate frameworks. The window to position soil biology within those frameworks is immediate: COP31 represents a convergence point for land based solutions, circular economy transitions, and regenerative agriculture. The research base, including the Rodale Institute Farming Systems Trial, the IPCC land-use chapters, the 4 per 1000 Initiative, and a growing body of peer reviewed soil ecology work, provides the foundation for a stronger claim. That claim needs to arrive at COP31 with validated field evidence, credible partnerships, and a clear policy proposal.

Turning Tides is developing a strategy to position Living Soils for recognition within the COP31 High Level Climate Champion framework, building on engagement with the Zero Waste Foundation and Zero Waste World networks. The goal: arrive at COP31 with a clear, actionable strategy, a validated pilot portfolio, peer reviewed science, and a cross sector coalition.

Pathway to COP31

- Full white paper with scientific review
- Confirmed validation partners
- Launched pilot demonstration sites
- Policy briefs for municipal / climate audiences
- Cross sector coalition assembled

The Proposal

Living Soils is positioned at a moment of genuine convergence, where waste systems reform, soil science, and climate policy are being forced to address the same underlying crisis through different framings. We are asking partners, institutions, Indigenous knowledge keepers, and policy actors to act on that convergence:

- Recognition of living soils / soil biology as a defined climate intervention category within international climate frameworks
- Inclusion in High Level Climate Champion pathways at COP31 Antalya 2026
- Integration of biological resource value into municipal organics policy frameworks
- Investment in pilot scale validation sites across agricultural, municipal, and community contexts (2026–2028)
- Development of biological performance standards for soil inputs through the Living Soils Producer Standard

Join the Initiative

The science is established. The pilots are underway. The policy moment is arriving. What remains is a coordinated intervention across sectors that have not yet acted together.

Turning Tides is looking for partners who bring operational capacity, scientific expertise, Indigenous knowledge, policy access, and community relationships that can make this framework real across diverse contexts. The moment to build is now. To connect with the Living Soils Initiative, contact Turning Tides at: info@turningtides.ca

References & Scientific Grounding

Rodale Institute, Farming Systems Trial and Regenerative Organic Agriculture and Climate Change (2014). Ingham, E., The Soil Food Web School. Brown, G., Dirt to Soil (2018); Kiss the Ground, 100 Million Acres Initiative. Woods End Laboratories; Deveron Network. Lal, R. (soil carbon and land restoration, Ohio State University). Bardgett, R., Soil Ecology and Ecosystem Services (2012). IPCC, Climate Change and Land (2019). 4 per 1000 Initiative (French Ministry of Agriculture). FAO, State of Knowledge of Soil Biodiversity (2020). Soil Health Institute; FiBL (Research Institute of Organic Agriculture). Climate projections are indicative; subject to field validation and regional variation.