

The Right of a Theory to Empirical Testing

Organisational and Metascientific Constraints on the Study of Soil after War

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Protocol status

This document records the development of a discussion about why the study of war-affected soil cannot be reduced to the selection of laboratory indicators and the application of existing standards. In the course of the conversation, what began as a theoretical question gradually became a question about the organisation of science: who defines the object, who obtains access to the territory and samples, who sets the list of admissible methods, who controls the data, and who decides which theory may be tested at all.

The document is neither a transcript nor a conventional scientific article. It preserves the sequence in which the problem was formed, the concepts accepted, the substitutions rejected, concrete examples, interim conclusions, and questions that remain open. Its purpose is to make the logic of the research visible before it is reduced to the format of an abstract, talk, presentation, or project proposal.

Language of the discussion

The original discussion and the approved protocol were prepared in Russian. The present version is the closest possible English translation. Its task is to preserve the content of the thought as precisely as possible, not to adapt it to the norms of English-language academic writing. The translation must not change the object, soften the conclusions, or replace direct formulations with academic euphemisms.

Abstract

The protocol examines the metascientific and organisational problem of studying soil after war. Soil altered by war is a configurational and theory-dependent object of observation: its condition is determined not by a single contaminant, but by a combination of the territory's prior history, military impact, functional changes, new pathways of substance transfer, the disappearance or appearance of pollution sources, subsequent use, and long-term ecological relations. Soil contains more potential information than any single study can record. Theory therefore precedes the scientific fact: it determines sampling locations and depths, the list of substances, detection limits, the time horizon, and the relations to be studied. Particular attention is given to three levels of an expert's initial position—declared, operational, and institutional—and to how the boundary of a specialist's competence may be mistaken for the boundary of the object. The normative substitution of theory is examined: a state standard is used as if it were a complete model of soil, although it is a historically limited regulatory instrument. The concepts of normative time lag, lawful invisibility, momentary normative safety, and the normative trap of military pollution are introduced. Theoretical diversity is understood not as recognition that all theories are true, but as the right of a theory that has formulated testable consequences to gain access to data and conditions of testing. Denial of such access creates the paradox of forbidden evidence. The theory of military ecotones is considered as a specific case, and an open pre-project theoretical and methodological review of international research is proposed.

Keywords

soil after war; theory of military ecotones; theoretical diversity; empirical testing; configurational object; theory-dependent object of observation; metascience; organisation of research; expert's initial position; boundaries of competence; controlled theoretical plasticity; normative substitution of theory; normative time lag; lawful invisibility; normative trap; paradox of forbidden evidence; methodological assimilation; supporting science; military pollution; international review; expert–AI

1 The initial paradox

The discussion did not begin with a laboratory indicator or a particular type of pollution. It began with an organisational fact: at a conference originally devoted to war, soil, and freshwater, there was not a single independent paper on soil affected by war. Hundreds of approaches to specialists, including authors of publications on soil and war, did not lead to a substantive discussion. Most recipients remained silent; a small number sent routine replies.

This fact cannot be explained by a lack of specialists, methods, or publications. Specialists exist. Methods exist. Project proposals on the subject are possible. Yet willingness to participate in a funded project is not the same as willingness to discuss openly the scientific correctness of the definition of the object, the initial theoretical positions, and the limitations of the methods applied.

The scientific community is prepared to study what has already been recognised as an admissible subject of a project, but it is not necessarily prepared to discuss whether the object of study itself has been defined correctly.

This is where the substitution of the object by the subject becomes visible. The object is the real soil system changing after war. The subject becomes what a particular organisation, agency, or scientific school has agreed to measure and to regard as a sufficient description of that system.

2 Why a discussion of theory became a discussion of the organisation of science

At first sight, the question should have been theoretical: what is soil after war, and through which concepts should it be described? But a theory does not exist in science by itself. For it to be tested, access is required to the territory, samples, laboratories, archival data, funding, and publication of results. All these resources are distributed by organisations.

The question of theory therefore inevitably becomes a question of power over research. Freedom of hypotheses may be recognised verbally while the work is organised so that only hypotheses already embedded in an administrative or institutional system are allowed to be tested. In that case, formal freedom of thought does not produce diversity of empirical knowledge.

For the author of this protocol, these organisational questions are not secondary. They determine which fragments of reality can become scientific facts at all. If an alternative researcher is denied access to the object, the later absence of that researcher's results is presented as an absence of grounds for the theory. An organisational decision is transformed into an allegedly scientific conclusion.

3 Soil after war as a configurational object

Soil after war is not merely the former soil with an added contaminant. War changes the regime of a territory. It can create new substances and concentrations, destroy industrial facilities, terminate former production, alter hydrological relations, stop agriculture, cause depopulation, create minefields and territories of fear, and change monitoring and control. Some changes occur immediately, others develop slowly, and still others appear after economic activity resumes.

The term 'configurational object' was therefore accepted. It means that what matters scientifically is not only the list of elements, but also their combination, sequence of appearance, spatial relations, temporal dynamics, and interaction with earlier layers of pollution. The same detected element may have an industrial, agricultural, domestic, or military origin. In an old industrial region, war does not begin the history of pollution from zero; it changes an existing system of sources, transfers, control, and observation.

The researcher encounters an innumerable set of fragments. The selection of fragments depends on the initial theory. The absence of an openly declared theoretical position therefore does not make research neutral. It merely leaves its determining assumptions hidden.

4 The author's initial position

The author's initial position is stated directly: the research is conducted from the standpoint of the theory of military ecotones. This is a relatively new theory. It is inconvenient for institutionally established ways of describing military pollution and has not yet received broad recognition. These circumstances prove neither its truth nor its falsity.

The theory of military ecotones treats war as a change of regime that creates a new natural–anthropogenic reality. A military ecotone is not reduced to a polluted landscape and is not defined only by visible destruction. It is formed through functional inversion, a war-induced discontinuity, trigger sensitivity, a change in the regime of territorial use, new and old layers of pollution, carrier-dependent boundaries, and subsequent transformation.

Applied to soil, this theory establishes its own field of visibility. It requires investigation not only of whether a sample meets a standard, but also of the origin of changes, the configuration of relations, dynamics after the end of hostilities, possible reactivation, transfer of pollutants into water, plants, animals, and food, and the consequences of a changed regime of territorial use.

Open declaration of a position is not a weakness but a condition of testability. The reader and another researcher must know why these particular questions, sampling points, indicators, and time horizons were selected.

Theory precedes the scientific fact

A set of recorded facts is already the result of selection. Methodology determines not only how a researcher studies an object. It determines which part of the object the researcher is capable of seeing. This is especially important for soil: it contains an enormous amount of potential information that cannot be recorded in full.

Before a result is obtained, decisions must be made about what counts as significant, which substances to seek, where and at what depths to take samples, what to compare the results with, which ecological relations to test, and what duration of observation is sufficient. Consequently, empirical soil appears within research only after theoretical selection.

A fact exists in reality, but it becomes a scientific fact within a particular theoretical and methodological system.

A theory does not create a concentration of lead, explosive residues, or a change in the microbiota. But it determines whether they will be found, measured, connected with other processes, and recognised as significant. In this sense, a completely neutral soil sample does not exist. The sample itself is material and real, but its scientific meaning depends on decisions made before sampling.

- why the sample was taken precisely here, at this depth, and at this time;
- why precisely these elements, compounds, or biological indicators are analysed;
- why these detection limits are used;
- why the result is compared with this particular standard;
- why grain is studied rather than water, microorganisms, animal tissues, or human health;
- why observation ends after a single season.

Three levels of the expert's initial position

The expert's initial position must be divided into at least three levels. Mixing them creates a false impression of theoretical transparency.

Declared theoretical position. This is what a specialist states openly: soil is a natural body or an agricultural resource; heavy-metal pollution is being studied; land suitability is being assessed; a systems or landscape approach is applied. This level usually appears correct and professional.

Operational theoretical position. These are the actual assumptions that determine the programme: only a regulated substance is considered significant; absence of an exceedance is understood as absence of danger; one season is treated as sufficient; the agricultural function is taken as primary; transfer between media is excluded; unknown pollutants are not sought; absence of measurement becomes absence of a process.

Institutional initial position. It may not be called a theory at all: the land must be returned to use as quickly as possible; exports must continue; the recovery programme must be recognised as successful; results must not create uncontrolled consequences; the study must end with a recommendation by a fixed deadline. This level sets the admissible boundaries of the other two.

Implicit propositions and boundaries of competence

An expert may consider a position normal and neutral even though it includes many implicit claims: existing standards are sufficient; known pollutants are the main ones; everything significant is included in standard laboratory panels; chemical changes can be separated from biological ones; soil can be defined without studying water; the result from one site can be extended to a territory; absence of a known mechanism means absence of a relation; the methods used correspond to the new object.

Especially dangerous is the implicit assumption that a recognised expert is familiar with every advance relevant to the object. Competence is always limited. A soil scientist may know soil classification and agronomic indicators extremely well but be far less familiar with microelement analysis, mixture toxicology, microbiology, ecological epidemiology, or new military pollutants. This is not a personal defect. The problem begins when the boundaries of competence are not stated.

Competence in the study of one fragment is not competence in relation to a configurational object.

The term 'expert illiteracy' is not used here as a personal insult. It denotes the absence of necessary knowledge about a method or process outside a person's specialisation. Ignorance of the capabilities of modern microelement analysis, for example, affects the list of substances, the sampling design, laboratory requirements, detection limits, recognition of geochemical combinations, and the possibility of detecting a 'fingerprint of war'.

If a specialist does not know that a particular investigation is technically possible, that specialist may declare the question unresearchable or insignificant. The boundary of the expert's knowledge then becomes the presumed boundary of the object. The statement 'I do not know this' is imperceptibly replaced by 'this cannot be established' or 'this does not matter'.

The informational redundancy of soil

Soil is especially sensitive to the initial position because it is informationally redundant. Its chemical and microelement composition, isotope ratios, organic pollutants and decay products, mineralogical changes, physical structure, water regime, gas exchange, microbiota, plant communities, transfer into food chains, and traces of historical impacts can all be studied.

Each system of methods makes its own soil visible. Microelement analysis produces one image, agronomic assessment another, microbiological research a third, remote sensing a fourth, and sanitary inspection of products a fifth. Soil in reality does not depend on theory. Its scientific visibility does.

Affected soil is not only a configurational object. It is a theory-dependent object of observation.

Methodological detail and theoretical opacity

A publication may describe equipment, the number of samples, coordinates, statistical procedures, and laboratory protocols in detail. At the same time, it may fail to explain why precisely these indicators were selected, which model of the object determined the choice, which processes were excluded, what the method cannot detect, which alternative hypotheses were considered, where the authors' competence ends, and which institutional task shaped the design.

A study may be described in technical detail and remain theoretically opaque.

Supporting science and controlled theoretical plasticity

At first sight, supporting science has no stable theory: today it confirms one thing and tomorrow another, following the instruction of the state or an organisation. Yet its stable foundation lies outside the substantive science. The patron's decision is accepted as initially correct or inevitable; the task of science is to support it; facts needed to implement the decision are recognised as significant; uncertainty must not block action; the conclusion must not destroy the institutional goal.

Supporting science can change substantive explanations while preserving a functional metatheory: scientific knowledge must serve the patron's decision. Its results are not literally arbitrary. They must look professional, use recognised methods, avoid contradiction with obvious facts, preserve the confidence of colleagues and the organisation's reputation, and at the same time remain compatible with the assigned task.

Controlled theoretical plasticity. The capacity of supporting science to change substantive assumptions, significant indicators, and interpretations in accordance with the current institutional task while preserving the external form of scientific correctness.

Today the principal indicator may be fertility, tomorrow the concentration of a particular metal, and the day after tomorrow the conformity of grain with an export standard. The change of foundation will not be presented as a change of theory. Each time, the selected indicator will be declared the only scientifically correct one. Such science is theoretically indeterminate at the level of the object, methodologically specific at the level of the assignment, and institutionally stable at the level of function.

Passport of the expert's initial theoretical position

For the study of a configurational object, it is not enough to name the expert's discipline and organisation. Before the work begins, an open passport of the initial position is required. It should specify:

- what is regarded as the object and how affected soil differs from ordinary soil;
- which processes and spatial and temporal scales are regarded as significant;
- which fragments are studied and what is consciously left outside the work;
- why these indicators were selected and what the methods are unable to detect;
- which alternative hypotheses are considered and what data could change the model;
- in which areas the expert's competence is limited;
- which organisation assigned the task and what decision it expects;
- which state, economic, or commercial interests are connected with the result.

Such a passport is not a formality. It shows which particular version of soil the study creates and allows its limitations to be examined before a partial image is accepted as the object as a whole.

An expert arrives with an explicit and an implicit theory. Theory determines the questions. Questions determine the methods. Methods determine the fragments recorded. The fragments create a scientific image of soil. The image is accepted as the object. A decision about the whole is made on that basis.

Applied to soil, the fragment–whole paradox takes an expanded form:

We do not see the process. Our theory determines which fragments we record. We accept the image created from those fragments as the whole. We make a decision about the real object.

5 Theoretical diversity and the right to testing

Theoretical diversity is often recognised only rhetorically. An alternative viewpoint may be mentioned in the introduction, while the actual programme of field and laboratory work is constructed exclusively within the dominant approach. This is not theoretical pluralism. It is the symbolic presence of an alternative without the right to produce its own data.

A new theory has no right to automatic recognition. But it has a right to its own empirical testing.

The right to testing does not mean a right to a positive result in advance, guaranteed funding for every claim, or exemption from safety and quality requirements. It means the opportunity to formulate testable consequences and obtain proportionate access to the material without which testing is impossible.

Theoretical diversity also does not mean that all theories are equal. Theories may differ in conceptual clarity, explanatory capacity, coherence, empirical support, and ability to withstand refutation. But comparison must take place after genuine testing, not be replaced by an administrative decision about which theory is allowed to be tested.

6 The paradox of forbidden evidence

The discussion formulated the paradox of forbidden evidence. Its structure is simple:

1. A new theory is declared insufficiently supported.
2. On that basis, it is denied access to the territory, samples, laboratories, data, or funding.
3. Without such access, the theory cannot obtain the necessary empirical support or be substantively refuted.
4. The absence of new data is then used as evidence of the theory's weakness or uselessness.

An institutionally closed system emerges. The decision to restrict research itself creates the deficit of evidence later used to justify that decision. Outwardly, the procedure may appear scientific: there are competitions, expert councils, standards, and peer review. In fact, the alternative theory is eliminated before it encounters the object.

7 Who produces scientific facts

A scientific fact does not arise merely because a particular condition exists in nature. It requires observation, sampling, selection of an analytical method, recording, interpretation, and publication. Every stage depends on organisational decisions.

The following forms of control are especially important for the study of soil after war:

- access to the territory, including dangerous, mined, and administratively closed areas;
- permission to collect and remove samples;
- access to pre-war data, without which a ‘before and after’ comparison becomes weak;
- selection of laboratories and the list of substances to be determined;
- certification of persons and organisations recognised as official experts;
- the right to publish results that contradict the task of rapid recovery;
- control over data aggregation and the geographical precision with which data are presented;
- funding for long-term monitoring rather than only a one-time survey.

The question of theoretical diversity is therefore also a question about the distribution of research infrastructure. If one school controls access to the object and at the same time evaluates competing approaches, a structural conflict of interest arises.

8 Institutional optics and supporting science

Soil is an object under pronounced state and commercial patronage. It belongs to someone, is used economically, affects land value, and is connected with food production. Independent study of its post-war condition may therefore affect the direct interests of the state, major producers, exporters, and organisations responsible for recovery.

In Ukraine, the strong tradition of agricultural soil science is capable of determining in advance the form of future research. This approach is necessary for solving a number of tasks, but it does not exhaust the object. If its institutional position turns it into the only admissible optic, the new reality of war is studied as a variant of an old agronomic problem.

Here the regime of supporting science becomes visible. Science does not formulate an independent question about the object; it supports decisions already made by the state or the economic system. Land must be returned to use—the study determines the indicators needed for such permission. Product safety must be confirmed—the minimum sufficient set of substances is measured. A political or export problem must be avoided—uncertainty is presented as absence of risk.

The question ‘what happened to the soil?’ is replaced by the question ‘what must be measured to permit its further use?’

9 Normative substitution of theory

In soil research, it is often assumed that state standards already contain a sufficient scientific foundation. The question of the expert's initial theory therefore disappears and is replaced by a conformity check against normative values. But a standard is an instrument of regulation, not a complete theory of the object.

Many existing standards were developed in peacetime. They may not account for substances, mixtures, concentrations, transfer mechanisms, and types of impact that emerged during modern warfare. Even a high-quality standard answers only the questions for which it was created. Everything absent from its list may become legally invisible.

This creates the normative substitution of theory: a conclusion about the condition of soil is derived from conformity with an established list of indicators, although the list itself does not describe the military transformation of the soil system. Land and products may be lawful under national rules while remaining scientifically under-investigated.

For the international circulation of food, this creates the paradox of lawful risk. A product complies with the standards of its country of origin, but those standards may not cover relevant consequences of war. Formal legality does not prove actual safety, and differences between national standards become a cross-border normative gap.

A standard does not exist outside history

A state standard is a decision adopted at a particular time, for a particular territory, set of substances, technologies, land-use practices, and understanding of risk. It may have been created by competent specialists, but it still reflects a historical state of knowledge and public administration. A standard adopted before the war could not proceed from a reality that did not yet exist.

A substantial part of Ukraine's normative system was formed before the present war or before the appearance of its new forms of impact. When the relevant documents were adopted, there may have been no new munitions and materials, mass use of unmanned systems, polymer residues from fibre-optic lines, modern combinations of explosives, destruction of particular industrial facilities, large-scale militarisation of agricultural land, or new pathways of pollution transfer.

A standard created in peacetime may solve a peacetime task well. It does not follow that it can describe the war-induced transformation of soil.

Normative time lag. The reality of war produces new substances, combinations, and processes faster than the state system creates means of recognising and regulating them.

Lawful invisibility of military pollution

If a substance or process is not included in the normative system, the result may appear entirely lawful. The researcher checks the prescribed list. No exceedances are found. An accredited laboratory issues a protocol. An authorised organisation confirms conformity. The territory is returned to use.

At the same time, pollution may be absent from the list, remain unmeasured by the selected method, exist in another chemical form, lie below the standard sampling layer, have a patchy distribution, move, manifest years later, act in combination with other substances, or alter biological processes without an immediate exceedance of a chemical norm.

Everything may be done according to law while the object remains unstudied.

Lawful invisibility. A condition in which a real process is absent from the official picture not because it has been studied and refuted, but because the normative system does not provide for its detection.

Unregulated does not mean nonexistent

The normative system creates dangerous linguistic substitutions: 'not regulated' becomes 'does not matter'; 'not measured' becomes 'not detected'; 'does not exceed the standard' becomes 'safe'; 'not provided for by the method' becomes 'does not belong to the object'. These statements are not equivalent.

An official conclusion must distinguish at least six states:

- the substance was tested for and was not detected within the sensitivity of the method;
- the substance was detected below the established value;
- no applicable standard exists for the substance;
- the substance was not included in the analytical programme;
- the method used cannot detect it;
- the possibility of its existence was not considered at all.

Compressing these different states into the formula 'no exceedances were established' destroys information about the limits of the study and turns ignorance into a claim of safety.

Even a good standard remains limited

The problem is not confined to poor or outdated standards. Even a high-quality standard concerns a particular substance, concentration, medium, sampling method, known exposure pathway, population

group, and moment in time. Military pollution may be configurational: danger arises from a combination of several substances, physical destruction, changes in acidity and water regime, the death of microorganisms, cessation of land use, return of agriculture, and transfer into food.

Conformity of every measured fragment with standards does not prove the safety of a configurational object.

Safety of the moment and safety of the trajectory

Most normative checks record the condition at the moment of sampling. But a substance may move, bind to soil particles, transform, accumulate in organisms, become mobile after flooding, be brought to the surface by cultivation, enter plants after a change in acidity, and enter the food chain several seasons later.

Normative safety at a particular moment does not mean safety of the trajectory.

For affected soil this is fundamental: the object is defined not only by its present condition but also by the direction of transformation. A one-time check is not a forecast and does not replace monitoring.

The standard as a filter of empirical facts

If a standard replaces a theoretical position, it determines in advance the substances, methods, boundaries of admissibility, significant results, the moment at which the study ends, and the decision recognised as justified. A chain emerges: the state approves a standard; the standard determines the measurement programme; the programme creates a set of visible fragments; the fragments form the official image of soil; the image is presented as the state of the object; the decision is declared scientifically justified.

The initial theory does not disappear. It becomes invisible because it is hidden inside the normative system. Supporting science replaces responsibility to the object with responsibility to procedure. If the approved procedure has been followed, the result is regarded as correct regardless of how fully the procedure represents the new reality.

The normative trap of military pollution

Normative trap of military pollution. A situation in which a new war-induced reality is assessed through lists, thresholds, and methods belonging to the former peacetime regime, while the absence of a prescribed exceedance is taken as the absence of a problem.

Its structure consists of five links:

- war creates a new configurational object;
- standards preserve the description of the former object;
- research follows the standards;
- the new reality does not enter the measurement programme;
- normative conformity is interpreted as scientific safety.

A standard is an instrument of state regulation, not a theory of the soil system. Conformity with a standard answers the question of whether an action is permissible within a legal system. It does not answer the question of what happened to the soil. Unregulated pollution is not absent pollution. Military pollution may be entirely lawful and at the same time scientifically unrecognised.

10 Methodological assimilation of a new theory

Even when an alternative theory is admitted to a project, it can be deprived of its content through methodological assimilation. This occurs when it is allowed to participate only on condition that it

accepts someone else's definition of the object, list of indicators, time horizon, and criteria of sufficiency.

After such adaptation, the study formally contains the new theory but does not actually test it. The theory of military ecotones cannot be tested by a study in which soil is defined in advance only as an agricultural resource and the result only as permission or prohibition of use.

An independent research track means not isolation from common quality standards, but preservation of the theory's distinctive question. Requirements for documentation, reproducibility, safety, measurement quality, and openness about uncertainty should remain common. The initial assumptions of the dominant school should not become compulsory.

11 Scientific freedom and the material conditions of research

Freedom of scientific opinion guarantees nothing if there is no freedom of access to empirical material. Researchers may publish hypotheses without limit, but without samples and data those hypotheses will remain in a condition later used against them.

The right of a theory to testing must therefore have material content. For projects on soil after war, it includes:

- independent access to part of the territories and samples;
- the possibility of designing an independent sampling scheme;
- access to pre-war and current data with their provenance and limitations stated;
- the possibility of commissioning analyses of indicators absent from national standards;
- a separate budget for testing alternative hypotheses;
- the right to publish negative, inconvenient, and uncertain results;
- preservation of samples for repeat analysis by other groups;
- a time horizon sufficient to detect slow and latent changes.

Without these conditions, the call for theoretical diversity remains a ceremonial formula.

12 International projects and preliminary review

An international project on military soil pollution should begin not with the distribution of budgets and roles, but with an open discussion of initial theoretical and methodological positions. This discussion must not remain an internal matter for project leaders.

Every research group should answer in advance:

- What is recognised as the object of study?
- Which theory determines the selection of observed parameters?
- Which processes will remain invisible under the selected methodology?
- How are the pre-war, wartime, and post-war regimes of the territory distinguished?
- Which results could change or refute the initial position?
- Which state, administrative, and commercial interests are connected with the expected result?
- Which data, samples, and methods will be available to competing groups?

If a state insists that the condition of its soil and products fully complies with its standards, while those products enter the international market, the sufficiency of the standards must be subject to independent international review. Such a review must not automatically accept the national list of indicators as a complete description of safety.

Open pre-project theoretical and methodological review

Open pre-project theoretical and methodological review is a public examination of the definition of the object, initial hypotheses, methods, boundaries of competence, and institutional interests of participants before an international research programme is approved.

It must precede the distribution of budgets and roles. Otherwise, the international project finances the methodology of the leading organisation, while the other participants join an already defined object.

Before a project begins, open answers must be obtained to the following questions:

- what precisely is regarded as war-affected soil, and whether it is recognised as a configurational object;
- which processes the model includes and which types of military pollution are assumed;
- which pollutants are absent from existing standards;
- which relations among soil, water, plants, animals, and people will be tested;
- which time horizon is used;
- which methods are available to participants and what those methods do not detect;
- which standards are applied, when they were created, and for which conditions;
- which observation is capable of changing the project programme;
- which organisations have an interest in a particular result;
- who controls samples, data, interpretation, and publication;
- how independent repeat testing will be ensured.

Why publicity is fundamental

If discussion takes place only within a consortium, the usual hierarchy operates: the leading organisation formulates the object, partners join, and the final document creates the appearance of agreement. Disagreement can be removed as an editorial detail without leaving a trace in the project.

An open procedure makes disagreements visible, prevents the quiet removal of alternative hypotheses, records the limitations of methods, shows which questions were not included, allows results to be compared with initial promises, and gives external specialists an opportunity to identify missing methods and pollutants.

Publicity is not needed for a democratic ritual. It is needed to preserve scientific disagreement and the possibility of later testing.

13 Proposed principle of symmetrical access to testing

For the organisation of research, the principle of symmetrical access to testing is proposed. It does not mean equal funding for every idea. It means that admission criteria must not establish the truth of one theory in advance.

The minimum procedure includes seven steps:

1. State the initial theory openly and define the object.
2. Formulate observable consequences and research questions.
3. Specify the data and material conditions required for testing.
4. Record the conditions under which the theory will be changed or rejected.
5. Provide independent access to a proportionate part of the research infrastructure.
6. Publish the protocol, data provenance, uncertainty, and results.
7. Compare theories by the results obtained and their explanatory capacity, not by the institutional status of their proponents.

A theory does not deserve protection from criticism. It deserves the opportunity to be tested.

14 What the theory of military ecotones must accept

The demand for a right to testing also applies to the theory of military ecotones itself. It must not receive immunity from criticism merely because it is new or institutionally inconvenient. Its author must make the initial propositions explicit, define the concepts, show the transition from a concept to an observable indicator, preserve the protocol of decisions, and state uncertainty.

It is also necessary to state in advance what will count as a failure of the theory. If the proposed war-induced relation is not confirmed, if the 'before and after' difference is explained by other processes, or if the introduced concepts provide no additional diagnostic capacity, this must be recorded. Fallibilism is not a ritual reservation but a working principle.

The author's open position makes testing possible. The position of an expert who states only that approved methods and standards were followed may appear neutral, but it often contains far more hidden assumptions.

15 Previous cases as a methodological foundation

The discussion also drew on a series of studies concerning the population crisis of Hector's and Māui dolphins in New Zealand. This case matters not as proof of a particular causal relation, but as an example of unequal scientific attention to competing hypotheses.

A technically precise estimate of a demographic parameter may remain causally narrow if the research framework excludes chemical pollution, reproductive toxicity, immune disorders, and the combined effects of stressors. A bibliographic reconstruction can show both the presence of fragments of evidence and the absence of a study connecting source, internal dose, organism condition, and population outcome. It does not follow that the alternative hypothesis has been proved. Something else follows: testing it requires a programme constructed around the relevant question.

This logic transfers to soil after war. A method designed to permit land to return to agricultural use cannot automatically be regarded as a test of the theory of military ecotones. It answers a different question.

16 Accepted concepts

The following working concepts were accepted during the discussion:

Configurational object. An object defined by a combination of elements, relations, sequences of impacts, and trajectories of transformation, rather than by a simple sum of indicators.

Passport of the expert's initial theoretical position. An open description of the theory, definition of the object, selected methods, boundaries of visibility, and conditions for revising the position.

Normative substitution of theory. Replacement of the scientific question about the object by a conformity check against a list of administratively approved indicators.

Lawful invisibility. A condition in which a phenomenon is absent from an official assessment because it is not included in the normative scheme of observation.

Paradox of lawful risk. The possibility that a legally recognised product retains a scientifically unassessed risk.

Paradox of forbidden evidence. Denial of a theory's access to testing because of a lack of evidence that the denial itself reproduces.

Methodological assimilation. Formal inclusion of a new theory while removing its own definition of the object, questions, and criteria of testing.

Principle of symmetrical access to testing. The requirement that competing theories be evaluated after receiving a proportionate opportunity to obtain relevant data.

Independent research track. A part of a project in which an alternative theory preserves its own questions and design under common standards of quality and safety.

Theory-dependent object of observation. A real object whose scientific visibility depends on the initial theory, selected methods, and boundaries of competence.

Controlled theoretical plasticity. The capacity of supporting science to alter substantive assumptions and indicators in accordance with an institutional task while preserving the external form of scientific correctness.

Normative time lag. The lag of the normative system behind new substances, combinations, and processes created by war.

Momentary normative safety. A conclusion of conformity relating to a particular sample and time and not describing the object's subsequent trajectory.

Normative trap of military pollution. Assessment of a new wartime reality by means belonging to a peacetime regime, followed by identification of normative conformity with scientific safety.

Open pre-project theoretical and methodological review. Public examination of the object, hypotheses, methods, competences, and interests before a project is approved.

17 What was rejected

The following substitutions were rejected during the discussion:

- the idea that a state standard is in itself a sufficient theory of soil;
- the idea that legal conformity automatically proves environmental and food safety;
- the requirement to prove a new theory first without providing access to the object;
- formal inclusion of an alternative in a project while requiring the use only of the methods and categories of the dominant school;
- an understanding of scientific freedom only as freedom to publish an opinion without access to empirical material;
- reduction of soil after war to a set of individual pollutants outside the history of the territory and its ecological relations;
- the idea that the organisational conditions of research are an external administrative detail that does not affect the content of knowledge.

18 Main conclusions

1. The study of soil after war is not only a natural-science problem but also a metascientific one.
2. Theory determines which fragments of an extraordinarily information-rich soil system will be recorded.
3. A hidden theoretical position is not neutrality.
4. Organisations control the material conditions under which scientific facts are produced and can therefore restrict the field of admissible conclusions in advance.
5. Standards are necessary for regulation, but they do not replace a theory of the object and do not guarantee coverage of new types of military impact.

6. Theoretical diversity is real only when independent empirical testing is possible.
7. The theory of military ecotones should receive not a right to a positive assessment in advance, but the right to formulate and test its own consequences.
8. International projects should begin with public theoretical and methodological review and disclosure of institutional interests.
9. The result of a study should be not only a final conclusion but also a verifiable protocol of how that conclusion was produced.
10. An empirical fact about soil arises after theoretical and methodological selection; a detailed description of procedure therefore does not replace disclosure of the initial model.
11. The boundary of an expert's knowledge must not be taken as the boundary of the object. Limitations of competence are part of the research protocol.
12. Absence of a substance from the analytical programme, absence of an applicable standard, and its actual absence are different conditions.
13. Conformity with a standard at the moment of sampling does not describe the trajectory of soil transformation and does not replace long-term monitoring.
14. Publicity of the pre-project review is necessary to preserve disagreements that a closed consortium hierarchy can remove before research begins.

19 Open questions

- How should access to dangerous or closed territories be distributed in practice among competing research groups?
- What minimum amount of resources is sufficient for a fair test of an alternative theory?
- Who should conduct an international review of normative sufficiency, and how should conflicts of interest be prevented?
- How should samples and data be preserved for repeat analysis over decades?
- Which observable consequences of the theory of military ecotones, as applied to soil, should be tested first?
- How should the military layer of pollution be separated from earlier industrial and agricultural layers?
- How should negative and uncertain results be published so that they do not disappear from subsequent decisions?
- How should an expert–AI system be used to make assumptions explicit without turning AI into a source of new normative unification?

20 Next stage

The next block of discussion should address the scientific complexity of studying soil after war itself: the structure of the configurational object, distinction among pre-war, wartime, and post-war processes, pollution stratigraphy, selection of units of observation, temporal scales, ecological relations, and conditions for detecting a war-induced discontinuity. After that block is completed, the two protocols may be compared and, if necessary, combined: organisational constraints determine whether research is possible, while the scientific structure of the object determines the content of that research.

Changes from the previous version

Version 1.1. Three blocks were substantially expanded. First, the dependence of a scientific fact on the expert's initial position was examined in detail: the distinction among declared, operational, and institutional levels was introduced, and the boundaries of competence, informational redundancy of soil, and controlled theoretical plasticity of supporting science were described. Second, the analysis of the normative substitution of theory was expanded: normative time lag, lawful invisibility, the distinction between safety of the moment and safety of the trajectory, and the normative trap of military pollution were introduced. Third, a procedure for open pre-project theoretical and methodological review was developed, and it was explained why its public character is a condition for preserving scientific disagreement.

Sources used directly in the discussion

Gibbs, Andrew, and Dmitry Nikolaenko. 2026. 'Demographic Precision and Causal Narrowness: A Critical Review of Bennington et al. 2026 on Hector's Dolphin Fecundity and Bycatch Management.' *Pollution and Diseases*. <https://doi.org/10.66659/ctn59c96>

Gibbs, Andrew, and Dmitry Nikolaenko. 2026. 'Chemical Pollution and the Population Crisis of Hector's and Māui Dolphins. A Critical Research Bibliography, 1970–2026.' *Pollution and Diseases*. <https://doi.org/10.66659/ybmw2c82>

Gibbs, Andrew, and Dmitry Nikolaenko. 2026. 'Competing Hypotheses and Scientific Non-Recognition: Investigating the Hector's and Māui Dolphin Decline in the Context of Wartime Chemical Legacies.' *Pollution and Diseases*. <https://doi.org/10.66659/10csws50>

Nikolaenko, Dmitry. 2026. 'The Theory of Military Ecotones.' Publications and protocols cited in the discussion of war-related environmental transformation. *Pollution and Diseases*.

Statement of responsibility for the protocol

Artificial intelligence supported the discussion, formulated questions, proposed concepts, and systematised the content of the protocol. Dmitry Nikolaenko defined the initial theoretical position, accepted or rejected proposed formulations, provided institutional and empirical examples, and determined the final content. Responsibility for the published version of the protocol rests with the author.

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