The Scientist–AI Research System

An Integrated Working Standard for War-Related Environmental Contamination

Laboratory of Information Systems
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Overview 2 · 15-minute presentation · English

1 Opening

Speaker text · 0:00–1:09

We need a working standard that enables a small research group to investigate long-term war-related environmental contamination, preserve the grounds of its decisions, and revise its programme as evidence develops. This contribution states how we intend to organise that work.

The six preceding methodological contributions addressed the scientist–AI system, authorship and control, responsibility to the problem, hypothesis generation, evidence status, and field verification. Here we connect their functions into one research cycle. The Laboratory of Information Systems presents the standard, working with the Laboratory of Military Ecotones on its environmental application. [1]

Our initial conditions are limited resources and an incompletely understood, developing object. The proposed system must help us choose consequential questions, organise evidence, and determine the next justified action. Its adequacy will depend on what it enables us to investigate and establish. The programme described here remains a proposal for application and evaluation, not a claim that its empirical effectiveness has already been demonstrated.

2 Limited resources shape the research system

Speaker text · 1:09–2:28

Our standard starts from the circumstances of a small group. Such a group cannot investigate every location, obtain every analytical measurement, or maintain every specialism internally. It needs a disciplined relationship between the importance of a question and the resources required to address it.

The scientist–AI system can assist tasks that would otherwise consume considerable time: processing multilingual documents, comparing statements, identifying contradictions, maintaining alternative hypotheses, and preparing a programme of verification. The expert must check consequential outputs against their sources and evaluate their scientific meaning.

The benefit is task-specific. Faster document processing does not establish an overall saving if correcting its errors consumes the time gained. We therefore propose recording where AI improves work, where it adds checking costs, and where its output proves unusable.

Small resources also require external partnerships. AI does not provide instruments, sample analysis, site access, or specialist competence simply by generating a plan. Our design must identify which tasks we can perform, which require qualified partners, and which remain beyond the current project. These limits become part of the research record.

3 The object determines the questions

Speaker text · 2:28–3:40

We study war-related environmental contamination through a developing territorial process. In this programme, the Theory of Military Ecotones supplies explicit working concepts for describing the environmental object and planning its investigation. We must preserve the distinction between the object and our current account of it.

A project may examine one location, pathway, or period. Its bounded question must retain a connection to the larger process. Otherwise, a technically competent investigation can leave the relationship that matters unexplored.

For example, detecting a substance in a water sample establishes a result within defined sampling and analytical conditions. Explaining its origin, transport, duration, or significance requires additional evidence. The research record must prevent that local result from silently becoming a regional explanation.

Available archives, methods, disciplines, and funding opportunities are resources for addressing the object. Their availability cannot establish that a proposed question is adequate. When a resource constraint prevents us from examining a necessary connection, we must retain that connection as an unresolved task.

4 Integration preserves the links between decisions

Speaker text · 3:40–4:55

A multidisciplinary team does not automatically produce an integrated investigation. Several specialists can generate valuable reports while the transitions between their findings remain unexamined. Our standard requires explicit connections between the question, evidence, hypothesis, observation, interpretation, and next decision.

The cycle begins by formulating a problem and classifying the relevant evidence. Competing hypotheses then guide the selection of observations capable of distinguishing explanations. Field verification provides bounded results. Interpretation and model revision produce the next research question. These functions may require repeated movement between stages. [1]

Each consequential transition should be inspectable. Why did this source support that hypothesis? Why was this location selected? Which observation changed the assessment? What remained outside the test?

The unit of cumulative knowledge is a relationship that has been investigated with its evidential grounds and limits intact. Publications preserve and present that work. The shared record allows a later project to extend it, challenge it, or identify the missing observation. Integration therefore concerns continuity of reasoning as well as cooperation between disciplines.

5 Evidence status and hypothesis history

Speaker text · 4:55–6:11

The information system must preserve distinctions that interpretation depends upon. A traceable document containing a statement does not establish that the statement is true. A reconstruction of an event remains distinguishable from direct observation. An inference requires its premises. A prediction requires its model and assumptions.

We use five descriptions of epistemic origin: Observed, Documented, Reconstructed, Inferred, and Predicted. Verification is a separate coordinate describing the procedure used to check a bounded claim. Confidence is

another assessment, with stated grounds. This implements the distinction already developed in the preceding contribution on evidence status. [2]

The same separation applies to hypotheses. Their history should show when they entered the programme, what supported them, which alternatives competed with them, and why they changed or were rejected. AI-generated suggestions receive no automatic evidential privilege.

An evolving natural process can continue to produce uncertainty despite careful research. Our obligation is to retain the origin, scope, and consequences of that uncertainty. Concealing missing connections behind an apparently complete account would defeat the purpose of the system.

6 Field verification changes the programme

Speaker text · 6:11–7:24

The information system must maintain contact with material reality through observations designed for the question. A large collection of samples is not sufficient evidence for every interpretation that might be attached to it.

We propose selecting sites, periods, matrices, and comparison conditions according to what competing explanations predict differently. Archival reconstruction can establish priorities for investigation. Field results then test specified relationships within the proposed environmental process.

Every result returns to the shared record. It may support a hypothesis, expose an unexpected connection, or show that the design failed to discriminate between explanations. A non-detection retains its detection limit and sampling conditions. Its meaning depends on the question and the scope of the test.

The programme changes when the evidence warrants a change. Previous assessments remain available, together with the grounds for revision. This prevents successive campaigns from becoming separate episodes whose findings cannot be compared. The preceding contribution on field verification supplies the detailed requirements for this empirical part of the cycle. [3]

7 Research achievement and organisational incentives

Speaker text · 7:24–8:40

Obtaining a grant establishes that a project has attracted resources. Scientific achievement requires separate evidence of what the work clarified, tested, or resolved. This distinction is central to our standard.

Competition for funding and organisational position can shape the questions that a project proposes and the results it presents. The methodological failure occurs when these requirements displace significant relationships in the object, while project completion is reported as completion of the scientific problem.

We do not need to assign identical motives to every researcher to identify that failure. We can examine the question, design, evidence, and claimed result. A fragmented project may contribute useful knowledge. Its limits must remain visible, and the links requiring further investigation must not disappear from the programme.

Our response is an explicit standard that also applies to our own work. We must show which question was addressed, what supports the result, what remains unresolved, and why work stopped at the current boundary. Institutional standing, a publication count, or a successful application cannot substitute for that account.

8 The conference as a revision stage

Speaker text · 8:40–9:54

Preparing this series has already required us to clarify categories, distinguish procedures, and connect questions that initially appeared separate. The conference provides an opportunity to continue that work through documents, objections, field experience, and proposed collaborations.

We propose retaining a version of the programme before the conference and publishing a revised version afterwards. A concise change record should identify each significant revision and its grounds. Agreement among participants does not verify a hypothesis. A new observation, a corrected source, or a well-founded objection may change its assessment.

Useful revisions could include dividing a broad hypothesis into distinguishable alternatives, changing a research contour, identifying dependent sources, or replacing a proposed measurement that cannot answer the question. Unresolved disagreements should remain explicit rather than being removed to produce the appearance of consensus.

The conference outcome should therefore include a more precise programme of work. We can assess its contribution by examining what changed and which next actions became better justified. The event itself is one stage within continuing inquiry.

9 Long duration and cumulative understanding

Speaker text · 9:54–11:10

The reference to a century of research on Verdun raises an organisational question for our programme: how can successive investigations contribute to a connected understanding of a territory that continues to change?

Assessing the achievements and omissions of particular Verdun studies would require a separate examination of their evidence. Here we use the example to formulate a requirement for continuity. Neither the duration of research nor the number of publications alone establishes how fully a developing object has been explained.

Our standard asks whether later work inherits earlier questions, records, limits, and unresolved relationships. Can a new result revise the shared model? Can researchers identify what earlier investigations left untested? Can they compare observations across periods without losing their conditions of production?

The objective is to prevent each project from starting an independent history while the environmental process develops between campaigns. A short pilot cannot resolve an entire legacy of war. It can nevertheless leave a usable basis for the next investigation and an explicit account of what remains to be done.

10 Vietnam as an application and evaluation project

Speaker text · 11:10–12:29

The proposed Vietnam project offers a concrete setting for applying the standard. Publications on National Archives Centers II and III identify complementary bodies of historical records and possibilities for their use. They provide routes to evidence, not a completed reconstruction of present environmental conditions. [4, 5]

An initial programme could select a bounded question and candidate area, examine the relevant archival material, document spatial uncertainty, develop competing explanations, and prepare a justified pilot investigation. Subsequent observations would return to the same record and revise the assessment.

We must evaluate the research system as well as the environmental hypotheses. Did AI-assisted comparison reveal an error? Did the record improve the justification for a site? Did the team avoid an unnecessary

analysis? Did a proposed observation actually distinguish explanations? Could another researcher continue from the preserved material?

The dioxin framework also connects environmental inquiry with questions about exposure and later biological outcomes. Those transitions require their own evidence and research designs. An integrated record keeps them visible without treating an environmental measurement as proof of a particular health consequence. [6]

11 Responsibilities and the two laboratories

Speaker text · 12:29–13:42

The two laboratories provide complementary functions within this programme. The Laboratory of Information Systems maintains source provenance, claims, evidence assessments, hypothesis histories, and significant decision records. The Laboratory of Military Ecotones develops the description of the environmental object and its field verification priorities.

These are declared responsibilities within a developing organisational programme. Their publication does not establish that all required capacities are already operational. For each project, we must identify the people and partners who can perform and check the work.

AI participates across the cycle. Its consequential contributions require disclosure, including the system and version where identifiable, tasks performed, checking procedures, and material limitations. Responsibility for accepted interpretations and published claims remains human.

The concise logical record connects sources, assumptions, decisions, and results. It need not reproduce every sentence exchanged with AI. Relevant underlying records should remain available to support examination. The requirement is that another researcher can understand the basis of a consequential decision and identify what evidence would justify changing it.

12 An open working standard

Speaker text · 13:42–15:00

The standard should be published as a versioned programme linked to its supporting materials. The abstract, full conference text, presentation, and subsequent development can serve different purposes while remaining connected. Publication identifiers should be reported when assigned, rather than treated as proof that a proposed method works.

The next assessment concerns performance in actual investigation. We must determine which procedures improve understanding, which create unnecessary work, and which fail under the conditions of a small project. Changes require a recorded basis. Better AI capability may expand the programme, but future improvement cannot be assumed as a condition of its present validity.

The seventh contribution describes the operation of the research system. The later overview of the conference session has a broader task: explain what the eight contributions together change in the framing of the problem and the programme for investigating it.

Our commitment is to maintain a cumulative inquiry in which limited resources serve clearly formulated questions, observations can correct hypotheses, and new projects inherit a usable research record. This is how our two laboratories intend to work.

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