CALMet Conference XVI, 2025

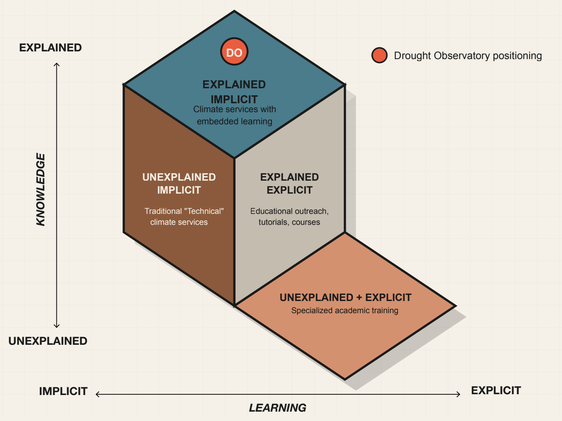
droughtcentral.it

CNR-IBE The Drought Observatory. A Climate Service Where Access Becomes Learning

CNR IBE
Istituto per la BioEconomia

Climate Services Epistemology

We adapt the relational logic of Greimas's semiotic square to map the conceptual space of climate services, focusing on two independent axes: *how knowledge is communicated* (**explained vs. unexplained**) and *how learning occurs* (**implicit vs. explicit**). The DO occupies the position of **explained content with implicit learning**—users learn while consulting, without requiring formal training but making accessibile drought knowledge.



Adapted from Greimas's semiotic square (1966)

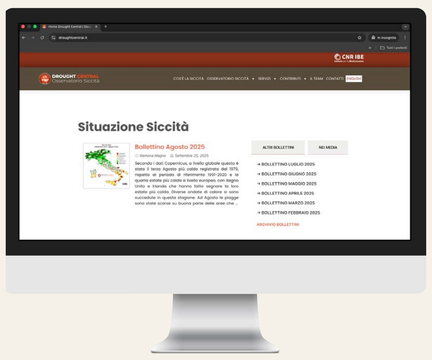
A Climate Service as Implicit Learning

Climate Services often reduce "service" to mere data delivery. The challenge is to design bringing together the makers and users of knowledge in ways that promote mutual learning, while respecting differences in values, interests, and ways of knowing. (Jasanoff 2003, *Technologies of Humility*)
The **Drought Observatory (DO)** droughtcentral.it adopts an approach where access becomes education and technical outputs become comprehensible knowledge—even for non-specialist users.
This inclusive design approach shapes services toward genuine accessibility, making maps, indices, and information not just technically clear but truly communicated.

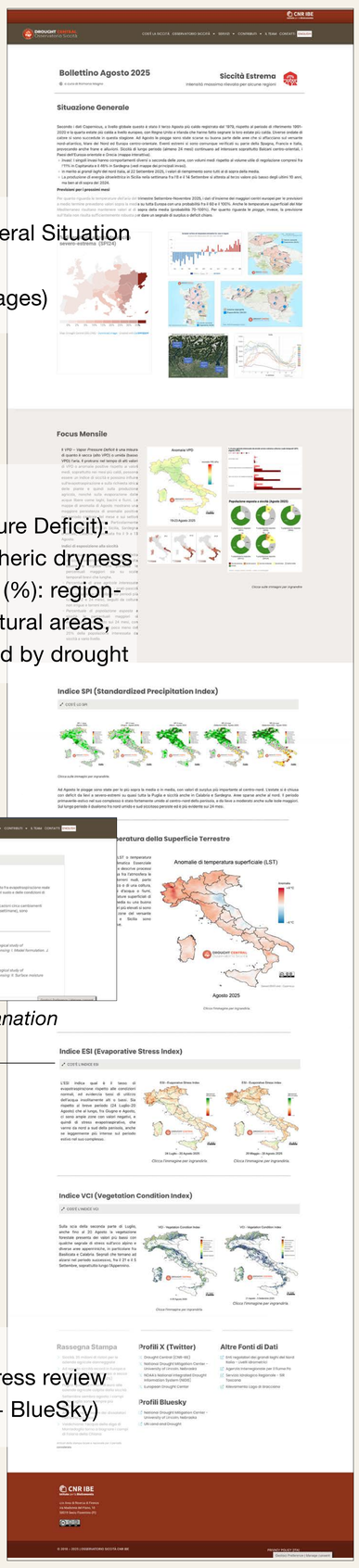
Semantic Design in Practice

How do we convey complex information while preserving clarity, navigability, and users' ability to orient themselves and act on what they learn?
The Monthly Bulletin layout exemplifies this philosophy. Each index includes expandable explanations of its scientific characteristics and context-related interpretation, using plain language that explains rather than merely asserts. The interface guides users through reasoning processes, making contexts, assumptions, and implications explicit—transforming data points into pathways to understanding. Similar principles shape the WebGIS, interactive Glossary, and "Drought Scan" dashboard (coming soon service).

The DO Home Page



The Monthly Drought Bulletin



Monthly Drought General Situation in Italy and Europe (Plain Language + images)

Monthly Deep Dive
→ VPD (Vapor Pressure Deficit): measures atmospheric dryness
→ Exposure indices (%): regional territory, agricultural areas, population affected by drought

Toggle with Index Explanation

Media And Social
→ Local / National Press review
→ Social Profiles (X + BlueSky)

The DO Integrated Services

A multi-user operational service

→ Monthly Drought Bulletin with contextual interpretation
→ WebGIS with key drought indices
→ Interactive glossary
→ REST APIs for data interoperability

"The DO SDI architecture is a process-based, multipurpose and multi-user operational service..." (Magno et al. 2018). The DO evolves continuously. Our research develops more analytical and accurate monitoring tools while expanding accessibility to stakeholders, media, and public audiences.

Information Architecture & Accessibility

Designing for Usability, not just Visibility

Building on information architecture principles emphasize that websites must be communication frameworks ensuring users can find what they search for. The DO embodies this approach through:

→ Hierarchical structure (H1-H3) in layout
→ Auto-highlighted glossary linking technical terms throughout
→ Toggle explanations contextualizing each drought index
→ Natural language maintaining scientific specificity
→ SEO optimization for discoverability.

drought central.it

Access. Understand. Act.

Impact - Metrics 2024

#1 Ranking Google Search Key Words

#siccità italia, #monitoraggio siccità, #Osservatorio Siccità, #Situazione Siccità

#2 Ranking Google Search Key Words

#Situazione Siccità Italia (after ISPRA Italian Major Environment Research Insititute)

213

National and International Media Contacts throught the website in two years time.

480

Monthly Bulletin tripled Unique vistiors: from 149 in 2018 to over 480 monthly unique visitors.

Transferable Lessons for Meteorological Training

This success stems from multidisciplinary teams that enable true cross-pollination of expertise. Beyond climate specialists, our team includes developers, visual designers, and communication experts. This collaboration proves essential: e.g. a visual designer learns scientific accuracy constraints; researchers grasp design principles that guide comprehension.
The result is semantic design—visual choices that carry scientific meaning, not just aesthetic appeal. This cross-pollination creates hybrid competencies where design becomes integral to the scientific communication process, not superficial decoration.

Broader Applications

For meteorological and climate trainers, this demonstrates that accessible communication requires structural changes, not just simplified language. Building teams with diverse expertise, fostering cross-pollination between disciplines, and embracing semantic design principles can transform how we bridge the gap between scientific knowledge and public understanding. The DO experience shows that viewing climate services as educational acts—spaces for implicit learning—can foster awareness, responsibility, and capacity for action. In an era of urgent climate communication needs, this approach offers practical strategies for democratizing scientific knowledge.

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Poster Semantic Design By Elena Rapisardi