NOVA IMS Information Management School

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Data Science and Advanced Analytics

Designing Climate Narratives: A Week of Climate Connection in Portugal

A Visual and Emotional Framework for Data Storytelling

Eugénia De Fátima Carrêlo Do Rosário

Master Thesis

presented as partial requirement for obtaining a Master's Degree in Data Science and Advanced Analytics

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STATEMENT OF INTEGRITY

I hereby declare having conducted this academic work with integrity. I confirm that I have not used plagiarism or any form of undue use of information or falsification of results along the process leading to its elaboration. I further declare that I have fully acknowledged the Rules of Conduct and Code of Honor from the NOVA Information Management School.

[Lisboa, 15.07.2025]

DEDICATION

Dedico este trabalho à minha família. Obrigada pelo vosso apoio, sempre.

ABSTRACT

As the urgency of climate change intensifies, traditional data-driven communication strategies often fail to translate public awareness into meaningful engagement. This thesis explores how emotionally resonant data storytelling can bridge the gap between cognitive understanding and affective response, particularly in the Portuguese context. Drawing on climate psychology, neuroscience, and design theory, the research investigates the roles of grief, hope, and cultural identity in shaping climate communication. Using a Research-through-Design (RtD) approach, the project develops *A Week of Climate Connection*, a seven-day analog postcard series that guides participants through an emotional journey from awareness to personal reflection. Each postcard visualizes national climate and energy transition data using metaphor, cultural symbolism, and tactile, emotionally paced design. The format embraces slowness and materiality as alternatives to the abstraction and urgency of digital media. Findings suggest that emotionally grounded design can foster introspection, strengthen memory, and increase personal relevance. While limited by the absence of formal evaluation and scalability challenges, the project offers compelling proof-of-concept. It contributes to emerging discourses on emotional literacy, participatory tools, and culturally contextualized climate communication. Future work should explore hybrid formats, educational settings, and empirical validation.

KEYWORDS

Climate Communication; Emotional Design; Data Storytelling; Visual Narratives; Climate Emotions

Sustainable Development Goals (SDG):

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RtD Research through Design

1. INTRODUCTION

Public awareness of the climate crisis has never been higher, especially in countries like Portugal, where intensifying wildfires, droughts, and coastal erosion have made environmental risks increasingly visible and tangible. Yet, despite this heightened awareness, a troubling gap remains between societal concern and individual behavioral engagement (Pihkala, 2020; Slovic, 2007). This disconnection lies at the heart of the climate communication challenge: why do well-informed, concerned citizens so often remain inactive?

Conventional communication strategies have traditionally relied on rational appeals, assuming that providing more information will naturally lead to more action. However, insights from climate psychology and neuroscience suggest otherwise. Emotional dissonance, including climate anxiety and ecological grief, plays a crucial role in shaping responses to climate change (Lertzman, 2015; Ojala, 2012; S. O'Neill & Nicholson-Cole, 2009). In Portugal, surveys by the European Investment Bank and Eurobarometer show that while over 80% of respondents support climate action, far fewer feel personally empowered or equipped to participate in the transition.

Portugal's national climate strategies, such as the PNEC 2030 and the Roadmap for Carbon Neutrality 2050 (RNC 2050), outline an ambitious path toward decarbonization through renewable energy, low-carbon mobility, energy efficiency, and community-based initiatives. Yet successful implementation depends not only on infrastructure and policy but also on fostering public trust, emotional resonance, and a sense of shared responsibility. Data, when designed empathetically, becomes not just a tool for reporting but a catalyst for engagement (Kennedy & Hill, 2018).

A 2025 study reported in Público found that while 83% of Portuguese citizens believe they could contribute more to addressing climate change, many feel a lack of concrete, relatable examples to guide their actions (Ferreira, 2025). This gap underscores the importance of emotionally resonant, culturally grounded storytelling strategies that not only inform but inspire agency.

This thesis explores how emotionally intelligent data storytelling can help address the psychological and cultural barriers that inhibit climate engagement. Specifically, it examines how affective and narrative-based visualizations can make abstract environmental data more relatable, hopeful, and actionable within the Portuguese context.

Drawing on frameworks from neuroscience, climate psychology, design ethics, and visual communication, this research proposes a design-led intervention: *A Week of Climate Connection,* a seven-day analog postcard series that translates national climate data into symbolic, culturally grounded, and emotionally sequenced narratives. The project aims to bridge the gap between top-down climate planning and bottom-up civic activation by reframing data not merely as information, but as emotionally resonant storytelling.

The following chapters provide the theoretical foundation for this approach, outline the methodology and design rationale, and reflect on the outcomes and implications of this emotionally driven model of climate communication.

2. LITERATURE REVIEW

This chapter surveys the theoretical, disciplinary, and cultural foundations that inform the design and development of *A Week of Climate Connection*. It brings together perspectives from data storytelling, climate psychology, participatory design, and emotional communication. Each section examines how existing frameworks and precedents shape the conceptual underpinnings of the project, with particular attention to cultural meaning-making and the emotional dimensions of climate engagement.

2.1. DATA STORY TELLING AND VISUAL NARRATIVES

Data storytelling is an evolving interdisciplinary approach that merges data science, narrative techniques, and visual design to enhance understanding and emotional engagement. While raw data is often abstract or inaccessible, storytelling provides context, connecting information to human values, memories, and lived experiences (Segel & Heer, 2010). In the realm of climate communication, visual storytelling plays a crucial role in bridging the gap between awareness and action by transforming statistics into emotionally resonant narratives.

Recent research explores how data visualizations can move beyond alarming rhetoric to enable constructive emotional shifts, supporting engagement through narrative pacing and audience agency (Morini et al., 2024).

Effective environmental data storytelling frequently uses metaphors, temporal structures, and symbolism to foster meaning. For example, Ed Hawkins' *Warming Stripes* distill decades of temperature data into a striking, minimalist gradient that conveys urgency through simplicity (Hawkins, 2018). Other notable works, such as *Dear Data* by Giorgia Lupi and Stefanie Posavec, and *Poppy Field* by Valentina D'Efilippo, exemplify how personal or environmental datasets can be visualized with emotional nuance, balancing subjectivity and scientific integrity (D'Efilippo, 2014; Lupi & Posavec, 2014).

Other projects like *Information is Beautiful* illustrate how visually rich, aesthetically curated data can capture attention and provoke curiosity, even outside formal academic contexts (McCandless, 2009).

These projects served as creative and conceptual inspiration for *A Week of Climate Connection*, where each postcard uses localized, symbolic visuals to evoke emotional and cultural connections. Informed by the principles of *"data humanism"* (Lupi, 2017), the design rejects neutrality in favor of intentional meaning-making. The use of tactile formats and culturally embedded visuals, such as Portuguese tiles and native flora, reinforces identity, place, and emotional resonance in the act of data communication.

2.2. CLIMATE EMOTIONS AND PSYCHOLOGICAL RESPONSES

Emotions play a fundamental role in how individuals perceive, interpret, and respond to climate change. As research in climate psychology has shown, emotional states such as grief, anxiety, guilt, and hope significantly influence engagement with environmental information and behavior (Clayton et al., 2017). Rather than being irrational, emotions serve as essential filters through which people appraise climate risks and determine relevance.

One particularly salient emotional response is *"climate grief"* or *"ecological grief",* a form of mourning linked to perceived or anticipated environmental loss (Cunsolo & Ellis, 2018). Whether rooted in personal experience or collective concern, this grief can foster a sense of solidarity and urgency when shared in communal spaces (Attanasio, 2020). At the same time, grounded or "active" hope has been identified as a positive predictor of pro-environmental behavior, especially among youth (Ojala, 2012). These emotions exist in a delicate balance: while grief and guilt can prompt reflection, excessive exposure to fear or despair can lead to disengagement.

This dynamic is often described as *"emotional numbing"* or *"defensive avoidance"*, where overwhelming or fear-based messaging creates psychological distance and apathy (Weber, 2006). Climate communication, therefore, must sequence emotions carefully. Research suggests that messaging which transitions from difficult emotions (e.g., loss, guilt) toward activating emotions (e.g., hope, belonging) is more likely to sustain attention and behavioral intention. Empirical evidence shows that *cognitive hope*, a belief in the possibility of positive climate, outcomes consistently correlates with higher levels of engagement, although its emotional counterpart may behave more variably (Ojala, 2023).

A recent review of climate communication studies from the past decade finds that reducing psychological distance by framing climate impacts as local and immediate often enhances concern, but does not automatically lead to behavioral change. This highlights the importance of emotional resonance alongside informational proximity in designing more effective interventions (Kim, 2023).

Another recent study introduced a novel technique for making climate change feel psychologically closer by adjusting how facts are linguistically framed. This approach was found to reduce perceived distance, increase emotional responses, and raise risk perception, though its effects on sustained engagement were less consistent (Langlais et al., 2024).

This principles directly informed the emotional architecture of *A Week of Climate Connection*. The seven-day postcard series is designed to move participants through an emotionally paced journey, from awareness and grief toward responsibility, solidarity, and ultimately, empowerment. Each postcard introduces a specific emotional tone paired with localized data, creating a structured but flexible path toward personal reflection and agency.

2.3. Participatory and Narrative-Based Climate Tools

Participatory approaches to climate communication shift the role of the audience from passive recipients of information to active co-creators of meaning. These tools, ranging from citizen science platforms to community-led storytelling and visualization workshops, emphasize inclusion, emotional authenticity, and local knowledge (Trench, 2021). In the context of energy transitions and climate action, such methods are especially valuable, as they help cultivate trust, agency, and a sense of shared ownership.

Narrative-based tools play a unique role in this participatory landscape. Projects like climate diaries, speculative games, or future-facing letter writing campaigns invite individuals to explore their values, fears, and aspirations in relation to climate change. Initiatives such as *DearTomorrow* and *Letters to the Future* foster intergenerational reflection by encouraging people to write messages across time, connecting personal emotion with collective future scenarios. These tools validate lived experience and activate emotional dimensions often overlooked in policy or science-led communication.

Speculative design, a related methodology, encourages creative engagement with possible futures. Rather than predicting outcomes, it opens imaginative space for participants to explore desirable or cautionary scenarios. Within climate discourse, speculative approaches can build emotional resilience and agency by framing individuals not just as observers, but as shapers of what is to come.

A Week of Climate Connection builds upon this tradition by combining curated national datasets with reflective prompts designed to elicit personal insights. Each analog postcard invites the recipient to interpret visual metaphors and respond introspectively, creating a dialogue between factual information and emotional response. This hybrid approach blends data literacy with self-awareness, promoting a participatory learning process that affirms individual relevance within the larger climate narrative.

2.4. Emotional Design and Affective Interfaces

Emotional design refers to the intentional crafting of experiences that evoke specific affective responses. As outlined by Aftab and Rusli, emotional engagement can operate on three interconnected levels: visceral (aesthetic appeal), behavioral (ease of use), and reflective (personal meaning) (Aftab & Rusli, 2017). Within climate communication, affective design offers a way to make abstract or overwhelming data feel personally relevant, emotionally digestible, and psychologically engaging.

Affective interfaces leverage design elements such as color, metaphor, motion, and texture to guide emotional interpretation. In the climate context, these elements can shift data from being merely informative to being empathetic and motivating. For example, emotionally aware visuals can help users distinguish between nuanced feelings such as anxiety, grief, and hope, each of which plays a different role in shaping perception and motivating action. By

carefully sequencing and layering these cues, designers can foster deeper emotional resonance while maintaining clarity. Designers like Nijman exemplify how emotionally resonant visualizations can elevate ordinary datasets into compelling, relatable stories (Nijman, 2015).

This concept draws support from research on emotional granularity, the capacity to identify and articulate subtle emotional states. According to psychologist Lisa Barrett, individuals with a broader emotional vocabulary tend to process and regulate emotional experiences more effectively. In visual communication, this principle suggests that emotional labeling and framing can facilitate more intentional self-reflection (Barrett, 2017). In *A Week of Climate Connection*, each postcard is intentionally designed with a specific emotional tone, such as grief, responsibility, or hope, creating a scaffolded emotional journey that supports introspection and affective literacy.

Though analog in format, the postcard series mirrors principles commonly found in digital affective interfaces. Just as mood-aware dashboards or responsive UI designs use color and motion to reflect emotional states, the postcards rely on tactile, symbolic, and aesthetic elements to foster engagement. Flowers, handwritten textures, symbolic metaphors, and carefully chosen color palettes serve as emotional cues that deepen interpretation and memory.

These choices are not decorative, they are purposeful. By blending aesthetic design with psychological insight, emotional design becomes a tool not only for effective communication but also for fostering empathy, reflection, and ultimately, behavioral transformation. In a climate discourse often dominated by abstraction or alarm, affective design provides a more human-centered pathway for connection and action.

2.5. VISUAL LANGUAGE, SYMBOLISM, AND CULTURE

Visual language is never neutral; it is shaped by culture, memory, and place. In climate communication, symbolic representation plays a critical role in shaping how audiences connect with data. Icons, metaphors, colors, and spatial layouts all carry cultural meanings that can either foster or hinder emotional engagement (Roxburgh, 2007). A visual cue that is effective in one region may fall flat, or even cause dissonance, in another. Research on *psychological distance* highlights that local visual metaphors, such as culturally familiar icons can reduce climate risk perceptions and enhance personal relevance (Shah et al., 2023).

Drawing from semiotic theory, particularly Roland Barthes' view that meaning is socially negotiated rather than fixed (Barthes, 1988), this project intentionally grounds its visuals in Portuguese cultural references. By embedding localized symbols and aesthetic motifs, the postcards aim to enhance relatability and deepen personal resonance. For example, Day 6's design features a tile-like mosaic inspired by traditional azulejos, invoking craftsmanship, national heritage, and continuity across generations. This metaphor visually echoes the idea of building a collective low-carbon future, one piece at a time.

Floral imagery also plays a central role. Native species such as *hortênsias* and *jacarandás* are not just decorative but mnemonic, serving as emotional anchors tied to seasonality, geography, and memory. These plants visually connect recipients to a sense of place and continuity, inviting reflection on what is at stake locally.

Other design choices are similarly deliberate: the use of concentric forms in Day 5's community card evokes flow, movement, and interdependence, visually mirroring the structure of Lisbon's public transport network. Footprints in Day 3 subtly reference ecological impact, drawing visual inspiration from Portugal's Manueline and Gothic architectural motifs to root the message in local heritage. While Day 7's horizon line opens space for personal projection and long-term thinking.

By weaving semiotics, cultural symbolism, and affective cues into each design, *A Week of Climate Connection* avoids abstract universalism in favor of situated meaning. This approach transforms data visualization into a culturally literate dialogue, one where national identity, emotional tone, and scientific insight intersect. The result is not just comprehension, but emotional and symbolic belonging.

2.6. EMOTIONAL IMPACT AND CIVIC ENGAGEMENT

Emotions are not obstacles to rational climate action, they are, in fact, essential catalysts for civic engagement. Contemporary climate psychology emphasizes that feelings such as grief, guilt, hope, and solidarity play a decisive role in motivating behavior (S. J. O'Neill & Smith, 2014). Emotional responses help shape how individuals prioritize environmental issues and develop a sense of moral urgency.

Climate grief, often pathologized in early public discourse, is now increasingly understood as a valid and even productive emotional response to ecological loss (Cunsolo & Ellis, 2018). It reflects a deep connection to place, species, and future generations, and when acknowledged collectively, it can foster solidarity rather than paralysis. Similarly, guilt, when contextualized and balanced, can motivate pro-social behaviors. But the most mobilizing emotion may be hope, particularly when it is active and grounded in achievable outcomes (Ojala, 2023).

Studies show that emotional messages which evoke a sense of collective efficacy tend to outperform fear-based narratives in promoting civic participation. This approach aligns with the emerging concept of *"affective citizenship"* in which civic responsibility is understood not only as a rational duty but as an emotional commitment grounded in care, identity, and connection (Fritsche et al., 2018).

A Week of Climate Connection adopts this affective strategy intentionally. Its narrative arc moves through a structured emotional progression, from grief and guilt to hope, solidarity, and commitment. This emotional sequencing mirrors psychological models of adaptation, such as the stages of grief or the resilience cycle, allowing participants to process complex emotions without becoming overwhelmed.

Each postcard contributes to this journey by combining data, visual metaphors, and reflective prompts. Rather than dictate specific actions, the cards encourage introspection and invite emotional agency, offering a model of climate engagement that is personal, sustainable, and grounded in shared humanity.

By framing climate communication as an emotional experience, the project helps shift the discourse from abstract urgency to embodied relevance. It does not bypass facts; rather, it enhances their resonance by placing them within a narrative structure that supports transformation. In doing so, it expands the role of data from informing the public to emotionally engaging citizens in the collective work of climate transition.

2.7. Analog Formats, Slowness, and Reflection

In a media environment dominated by speed, alerts, and digital overload, analog formats offer a counterpoint: slowness, tactility, and presence. The *"slow media"* movement argues that physical formats foster deeper cognitive and emotional engagement by decelerating interaction and inviting mindful attention (Hallnäs & Redström, 2001). In the context of climate communication, where emotional overwhelm is common, this slower pace can create space for reflection, resilience, and personal integration.

A Week of Climate Connection deliberately adopts this slower rhythm. The choice of postcards as a medium is not nostalgic but strategic. Postcards are inherently physical, intimate, and time-oriented. They suggest pacing: one card per day, one emotion at a time. Physical cards, their texture, size, and color, support embodied interaction, encouraging recipients to hold, revisit, and display them in domestic spaces. This physical presence helps translate abstract climate data into daily, lived experience.

Research in educational and design psychology supports this approach. Tangible objects are more likely to be remembered and emotionally associated with personal meaning (Malafouris, 2014). The act of reading, handling, or writing on a physical card activates what some scholars call *"material engagement"*, a process through which cognition is shaped not only in the mind but through the body's interaction with physical forms.

Moreover, slowness serves an emotional purpose. The postcard series intentionally spaces out emotional exposure, allowing recipients to process difficult feelings (such as grief or guilt) gradually, rather than all at once. This temporal pacing mirrors practices from mindfulness and therapeutic models, which emphasize sequencing and recovery time between emotional stimuli.

The analog format also resists the impermanence of digital media. While social media posts disappear in feeds, postcards remain, on fridges, desks, or wall, becoming artifacts of sustained contemplation. Their non-distracting, screen-free nature makes them especially suited to emotional climate engagement, offering a rare invitation to slow down, feel deeply, and reflect with care.

2.8. NEUROSCIENCE AND EMOTION IN DECISION-MAKING

Advancements in neuroscience have fundamentally reshaped our understanding of how people make decisions, particularly under conditions of uncertainty and emotional intensity, as is often the case with climate change. Contrary to the traditional view that rational thought is separate from emotion, contemporary models emphasize that emotion is not only involved but essential to effective reasoning and behavior.

Neuroscientist Antonio Damasio's somatic marker hypothesis is a foundational concept in this field. It proposes that emotions, rooted in bodily responses, act as internal guides that help individuals evaluate complex choices and predict outcomes (Damásio, 1994). Far from being a hindrance to logic, these emotional signals provide cognitive shortcuts that make decision-making more adaptive, especially in high-stakes or morally charged contexts.

This idea is supported by neuroimaging research showing that emotionally salient stimuli activate brain regions linked to moral reasoning, risk assessment, and future planning, particularly the amygdala and ventromedial prefrontal cortex (Yang et al., 2020). These insights suggest that climate-related decisions are rarely made through dispassionate analysis alone. Instead, they emerge from a dynamic interplay of emotion, memory, imagination, and value alignment.

Embodied cognition theory further expands this view. It holds that cognition is not confined to the brain but shaped by bodily experience and physical interaction with the world (Gallese † & Lakoff, 2005). From this perspective, holding a postcard, tracing a design, or reading a handwritten prompt may activate not only visual and verbal processing but also emotional and somatosensory integration. This aligns closely with the experiential design of *A Week of Climate Connection*, where analog interaction is a key pathway to affective engagement.

Damásio and Yang argue that emotions are not just catalysts but substrates of moral thought and social behavior (Damásio, 1994). Their work underscores the ethical and pedagogical potential of emotionally intelligent design: not to manipulate, but to reflect how humans learn, care, and act.

In the context of climate communication, these findings validate the use of emotionally sequenced, materially grounded, and visually resonant tools, not as an alternative to rational discourse, but as a more human-aligned form of meaning-making and motivation.

3. METHODOLOGY

This chapter outlines the methodological framework behind the development of *A Week of Climate Connection,* a seven-day analog postcard series created to emotionally engage Portuguese audiences with climate change and energy transition. By applying a RtD approach, this chapter highlights how design becomes a mode of inquiry into affective climate communication. The methods used are grounded in emotional storytelling, data ethics, and iterative visual exploration.

3.1. RESEARCH APPROACH AND DESIGN RATIONALE

This project adopts a practice-based RtD methodology grounded in critical making and emotionally engaged communication. Rather than treating data visualization as a neutral or purely aesthetic exercise, the approach positions design as a method of inquiry, a way to investigate how climate information can be felt, reflected upon, and internalized through narrative and cultural resonance.

The work is informed by elements of RtD, which values the iterative development of artifacts as both process and output. In this context, *A Week of Climate Connection* functions as a designed intervention: a communicative tool meant to provoke emotional response, stimulate reflection, and support personal meaning-making. Its development combined desk research, emotional mapping, data sourcing and visual experimentation.

The methodology draws from both qualitative and speculative research traditions. It is qualitative in that it prioritizes subjective, affective responses over quantifiable behavioral outcomes. It is speculative in its aim to explore possibilities, prototyping what a more emotionally literate form of climate engagement might look and feel like, rather than testing a fixed hypothesis.

Throughout the design process, emotional pacing was explored through prototyping and thematic alignment between data and emotion. The goal was not to create an exhaustive system, but a situated, symbolic experience: a weeklong journey that embeds national climate data in a personal, affective landscape.

This approach recognizes design not as a secondary tool to science, but as an epistemological method in itself, capable of generating knowledge, fostering connection, and challenging communicative norms within the climate space.

3.2. PROJECT DEVELOPMENT PROCESS

The development of *A Week of Climate Connection* unfolded as an iterative and exploratory design process, structured around three core phases: research, synthesis, and design exploration. While the final outcome is a physical set of postcards, the project emerged from

layered decision-making grounded in emotional strategy, national context, and visual experimentation.

The initial phase focused on research, drawing from climate psychology, emotional design, and narrative communication literature, as well as national climate policy documents and datasets. This foundation helped identify both emotional and informational gaps, particularly the disconnect between general climate awareness and personal emotional resonance within the Portuguese context.

The second phase involved data selection and emotional mapping. Seven thematic clusters were identified: awareness, grief, responsibility, hope, community, imagination, and commitment. Each was paired with a relevant dataset tailored from national sources, such as government reports and official statistics (e.g., emissions, transportation, energy mix) and an associated emotional goal. This matrix served as the backbone for all subsequent design decisions.

The third phase focused on iterative visual prototyping. This included exploring metaphors, color systems, typography, and layout, while striving to balance information clarity with emotional tone. Informal feedback from a small group of peers and practitioners helped refine the work, with particular attention to symbolic alignment, legibility, and cultural specificity, such as references to tilework, native flora, and local architectural motifs.

3.3. DATA SELECTION AND CURATION

The selection of data for *A Week of Climate Connection* was guided by three intersecting criteria: national relevance, emotional resonance, and narrative diversity. Rather than aiming for comprehensive coverage, the goal was to identify datasets that could meaningfully represent different emotional themes across the week, serving as both content and context for each postcard.

Seven datasets were chosen from portuguese institutional sources, including the Instituto Português do Mar e da Atmosfera (IPMA), the Direção-Geral de Energia e Geologia (DGEG), Eurostat, Carris, Metropolitano de Lisboa, and public funding documents such as the Plano de Recuperação e Resiliência (PRR). These sources ensured both scientific validity and policy relevance.

Each dataset was paired with an emotional and thematic frame:

Table 3.1 – Data Themes by Day

Day	Theme	Content
1	Awareness	Average annual temperatures in Portuguese territory. Using annual average temperature data from 1931 to 2020.

2	Loss & Memory	Remarkable climate disasters that occurred in Portugal, include wildfires, floods, and droughts.
3	Responsibility & Guilt	National energy mix in kilotons of oil equivalent.
4	Hope & Possibility	Summary of initiatives/programs to help reduce the climate crisis in Portugal. (State-led initiatives in solar energy, electric mobility, and transit)
5	Community & Solidarity	Urban transport, comparative vehicle capacity and frequency data from Lisbon networks.
6	Imagination & Vision	Summary of green funding available for Portugal. Breakdown of €11B in climate-related funding categories.
7	Commitment & Integration	National emissions totals from 1990 to 2021.

The data was not used to prove a hypothesis or generate policy recommendations. Instead, they functioned as emotional touchpoints, anchoring each day's postcard in material reality while allowing for metaphor, symbolism, and interpretation. Care was taken to preserve the integrity of the data while adapting it into forms that supported emotional reflection and narrative flow.

This curatorial process positioned data not as a fixed truth, but as an interpretive tool, bridging fact and feeling, system and self.

3.4. EMOTIONAL SEQUENCING AND NARRATIVE ARC

The emotional structure of *A Week of Climate Connection* was carefully designed as a paced, effective journey. Rather than treating climate data as a static information set or a blunt call to action, the project unfolds through a deliberate emotional arc, mirroring how individuals come to terms with climate realities over time. This sequencing is inspired by models from psychology and grief theory, such as the resilience cycle, which emphasizes the importance of emotional processing and narrative pacing.

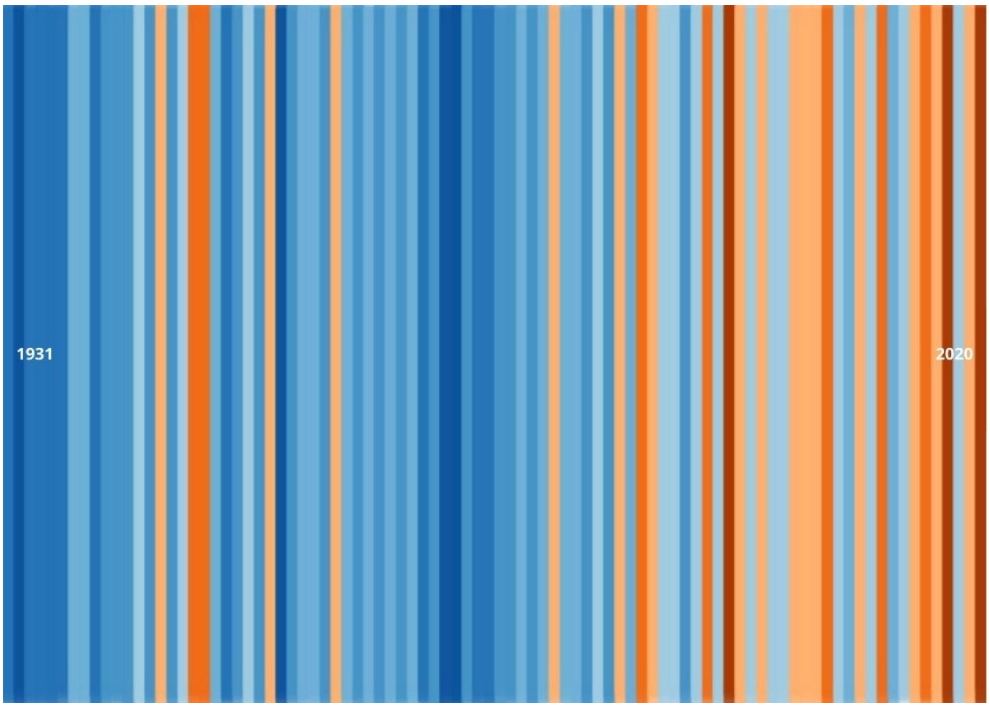

Figure 3.1- Day 1: Average Annual Temperature in Portugal, from 1931 to 2020

This is followed by Day 2, which evokes grief and memory through data on climate-related disasters such as floods and wildfires.

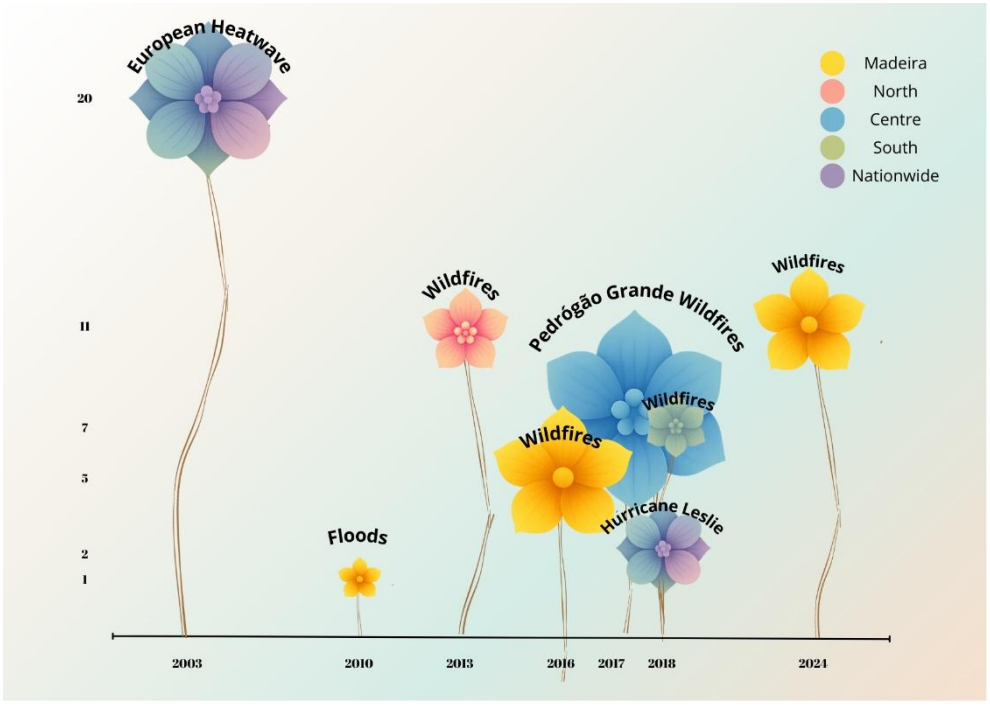

Figure 3.2 - Day 2: Significant Climate Disasters in Portugal

Day 3 shifts the focus inward, confronting personal and societal responsibility by visualizing Portugal's energy mix and reliance on fossil fuels.

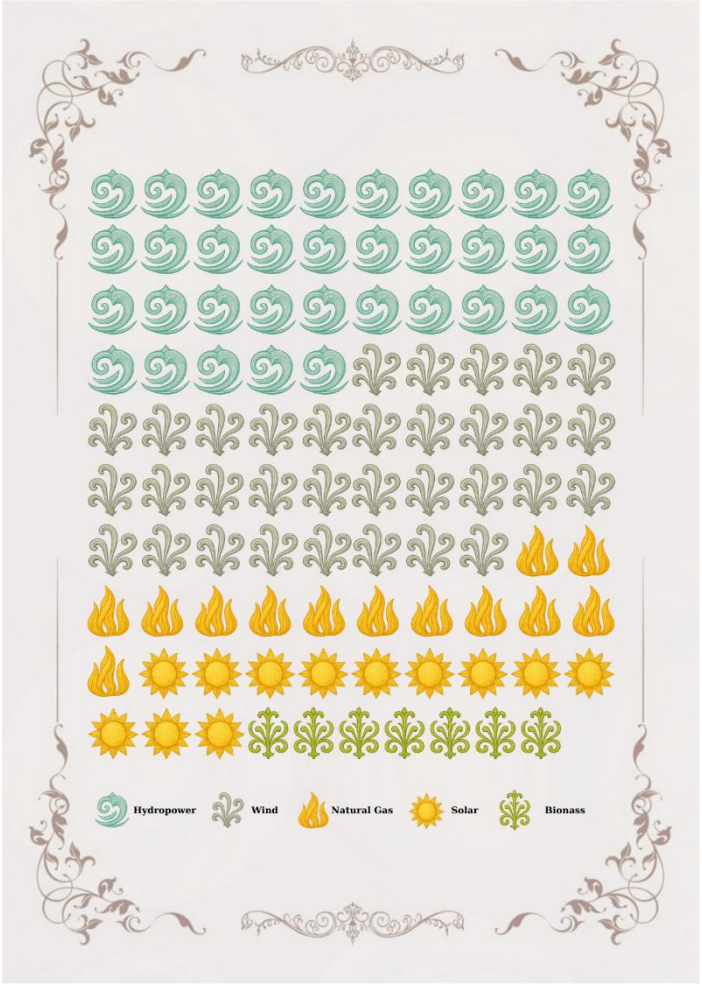

Figure 3.3 - Day 3: How Portugal Produces Energy

As the emotional weight builds, the tone gradually shifts. Day 4 introduces hope, not as blind optimism, but as the recognition of structural momentum, using data on public programs for solar energy, transit, and electrification.

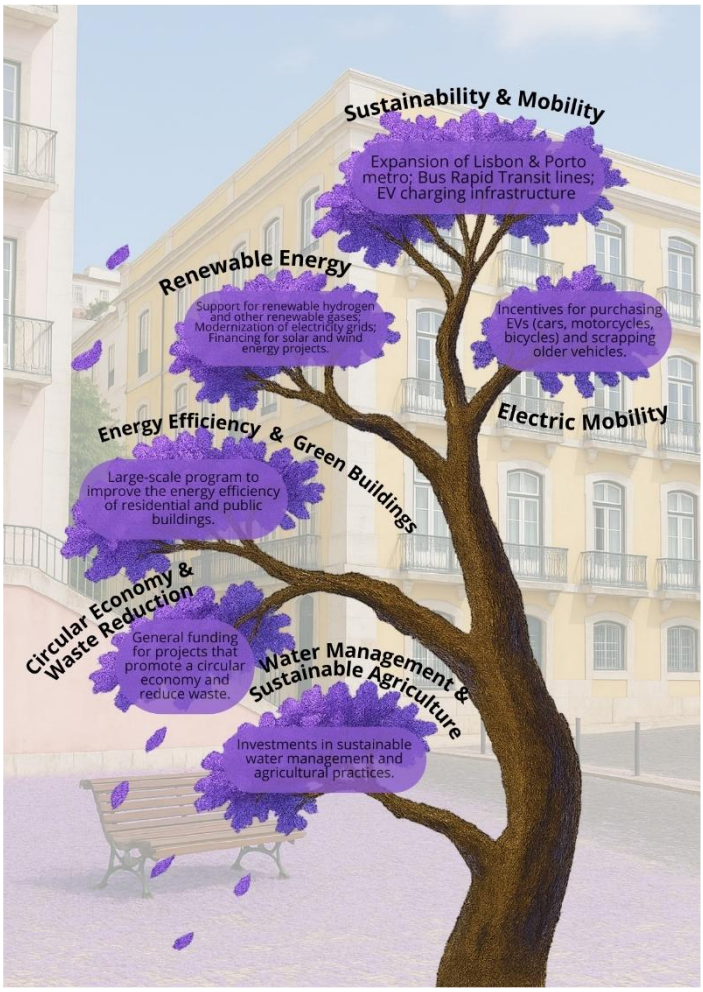

Figure 3.4 - Day 4: Initiatives & Programs to Support Energy Transition in Portugal

Day 5 deepens this with a sense of solidarity and urban community, illustrated through the collective infrastructure of Lisbon's transport system.

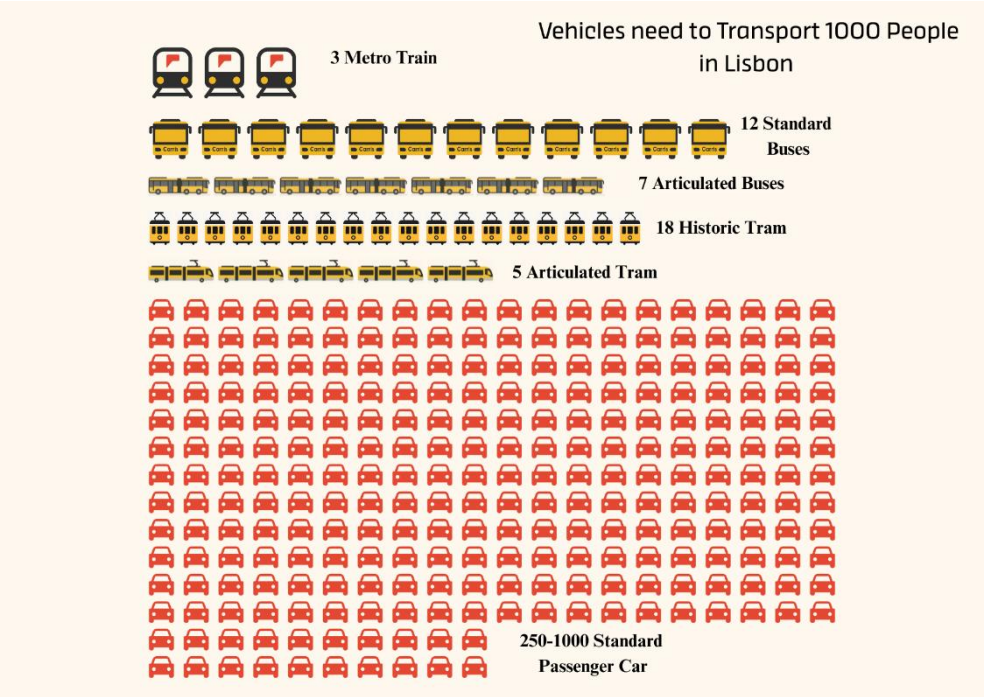

Figure 3.5 - Day 5: Vehicles Needed to Transport 1000 People in Lisbon

Day 6 invites imagination and forward-looking reflection, visualizing green investments and symbolic futures.

Figure 3.5 - Day 6: Green Sustainability Funding in Portugal

The sequence culminates on Day 7 with a quiet but deliberate return to personal agency. Accompanied by a long-view of Portugal's CO_2 emissions, the final card offers space for integration, encouraging recipients to pause, reflect, and consider their own place in the narrative.

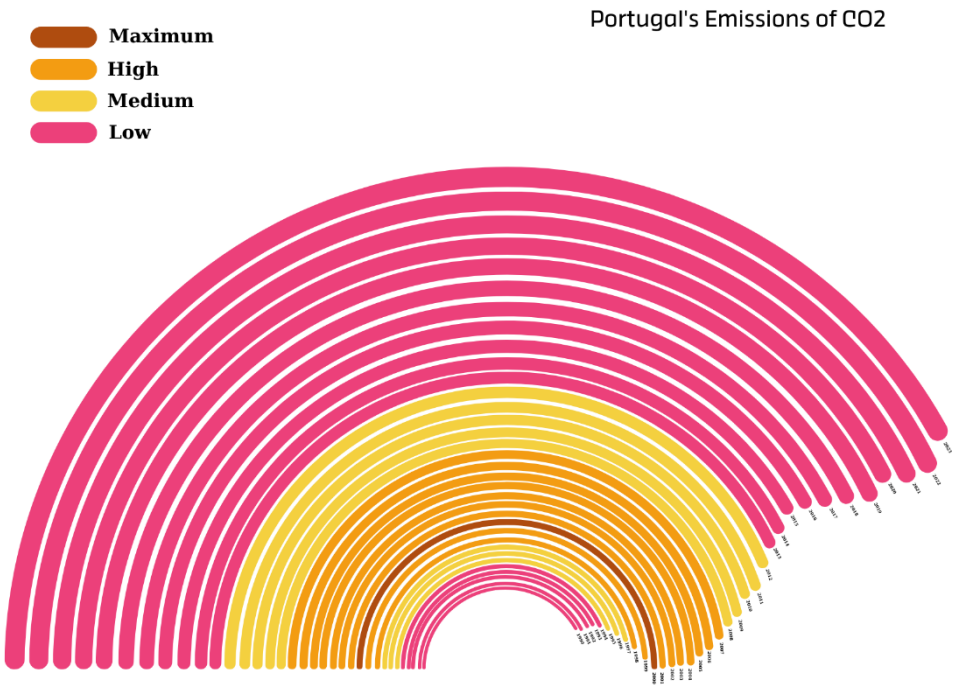

Figure 3.6- Day 7: Portugal's Emissions of CO2

This arc is designed to regulate emotional exposure while fostering momentum. Difficult emotions are acknowledged rather than bypassed, while more constructive ones, hope, imagination, commitment, are earned through that progression. The result supports depth, resilience, and engagement.

3.5. Visual Strategy and Design Language

The visual language of *A Week of Climate Connection* was shaped by a desire to balance data clarity with emotional and cultural resonance. Rather than relying on conventional infographics or abstract representations, the project embraces metaphor, symbolism, and tactility to make climate information feel intimate, lived, and contextually grounded.

Each card was designed to express its emotional theme not only through content, but through visual tone. The color palettes were not arbitrary; but derived from both ecological references and emotional color theory, helping guide the viewer's intuitive response before even reading the data.

Cultural references were embedded throughout the series. Day 6's tile-inspired mosaic pays homage to *azulejos*, reinforcing national identity and artisanal craft. Floral imagery, featuring native species like *hortênsias* and *jacarandás*, functions not only as decoration, but as memory

triggers and symbols of place. Concentric circular patterns used in the community card mirror Lisbon's transit networks and the flow of collective movement.

The visual design process was iterative, involving sketching, analog mockups, and digital refinement. Each decision was guided by the project's core intent: to make climate data not only visible, but affectively and culturally legible. This approach resists the neutrality often associated with data graphics, embracing instead a form of storytelling that invites care, reflection, and emotional presence.

3.6. Reflections on Method and Design Ethics

The process of developing *A Week of Climate Connection* raised ongoing questions not only about form and message, but also about ethics and authorship. Designing for emotional engagement, particularly around climate, demands a high degree of sensitivity. It requires acknowledging the vulnerability of the audience, the complexity of the subject, and the limitations of what design alone can accomplish.

Throughout this project, methodological choices were guided by a desire to invite rather than instruct. The project does not prescribe specific actions or frame recipients as passive consumers of awareness. Instead, it proposes a participatory ethic of feeling, noticing, and processing. By emphasizing slowness, tactility, and cultural grounding, the design resists the pressure of urgency that often dominates climate discourse, without diminishing the seriousness of the issue.

There is also an ethical tension in visualizing climate data: how much simplification is responsible? When does clarity become distortion? These questions were addressed through a balance of transparency and interpretive freedom. Each visualization aimed to preserve the integrity of the data while also creating space for emotion and cultural meaning. The goal was not to educate in a conventional sense, but to build emotional literacy and invite reflection.

Finally, the method itself, a fusion of practice-based research, emotional storytelling, and design experimentation, was chosen to generate a kind of knowledge that cannot be accessed through metrics alone. It privileges the exploratory process over the demand for definitive proof, recognizing that knowledge can emerge through making, feeling, and reflecting, rather than only through empirical validation. This is not a universal model, but a situated response: a design methodology shaped by context.

4. RESULTS

This chapter offers a reflective evaluation of *A Week of Climate Connection*, focusing on how the project's intentions align with its outcomes. Rather than relying on external feedback or empirical testing, the assessment draws on internal analysis of the project's conceptual coherence, design decisions, and communicative potential.

4.1. REFLECTIVE EVALUATION APPROACH

The evaluation centers on four interconnected areas: emotional pacing, visual language, cultural framing, and the role of materiality. Each is considered in relation to the overarching goals of the project, to foster emotionally resonant, culturally situated, and personally reflective engagement with climate data.

As a practice-oriented work, this project does not produce results in the conventional sense. Instead, the value lies in what is revealed through the making process itself. The postcards function not only as a communication artifact but also as a method of inquiry, raising questions about how climate emotions can be represented, how narrative structure affects reception, and how physical form influences perception and reflection.

This chapter does not attempt to measure success or impact. Rather, it surfaces meaning through reflection, identifying where the project holds weight, where tensions remain, and what insights emerge about alternative approaches to climate communication.

4.2. EVALUATING THE EMOTIONAL ARC

One of the central goals of *A Week of Climate Connection* was to create a carefully paced emotional journey, one that mirrors the complex feelings often associated with engaging deeply with the climate crisis. The seven-day structure was designed not only to deliver information, but to guide recipients through a progression of emotional states: from awareness and grief to responsibility, hope, community, imagination, and commitment.

In retrospect, the structure succeeds in establishing a rhythm that balances emotional gravity with space for reflection and uplift. The early days of the sequence present heavier content, rising temperatures, disaster memory, and energy dependency, which are intentionally front-loaded to confront the viewer with climate realities. These are offset in the latter half of the week by more forward-looking and connective themes, such as public action, urban cooperation, and investment in green futures. The pacing allows emotional contrast to emerge, which helps prevent overwhelm and fosters a sense of momentum.

The placement of hope at the midpoint, rather than at the end, is particularly effective. It signals a turning point in the arc and introduces a sense of possibility without bypassing earlier discomfort. Likewise, ending with commitment, framed as a quiet integration rather than a demand for action, respects the personal and open-ended nature of the experience.

Some tensions do arise when reflecting on the sequence. Not every emotional state may resonate equally with all recipients, and the progression relies on a linearity that may not reflect everyone's lived emotional reality. Grief and responsibility, for instance, are not stages that can be fully "moved through" in a single day. Yet this constraint also speaks to the format's strength: the series does not aim to resolve emotions, but to make space for them.

Ultimately, the emotional arc offers a structured but open experience, one that encourages recipients to encounter their own reactions within a thoughtful narrative framework. It functions as both an invitation and a framework, suggesting that emotional engagement with climate is not only possible, but necessary, and that such engagement can be held with care.

4.3. VISUAL LANGUAGE AND SYMBOLISM

While the visual strategy of *A Week of Climate Connection* was carefully crafted to support emotional and cultural resonance, reflection on its outcome reveals both strengths and complexities. The aim was not only to communicate climate data clearly, but to do so in a way that evokes emotional engagement and rootedness in place.

In many ways, the visual system succeeded in aligning tone and theme. The emotional atmosphere of each postcard was reinforced by its design, and the illustrations and layouts helped build a rhythm that complemented the narrative arc. The symbolism embedded in native plants, tile-inspired patterns, and public transit motifs offered layers of meaning that extended beyond surface aesthetics. These choices grounded the abstract issue of climate change in a more familiar, local context.

However, some challenges emerged in balancing clarity with complexity. At times, the visual density of certain cards, risked overwhelming the viewer. Striking a balance between expression and legibility required careful iteration, and in some cases, certain elements may still compete for attention rather than harmonize.

The open-endedness of symbolism also invites multiple interpretations. While this was a deliberate choice, it raises questions about how much meaning is communicated versus inferred. For example, floral motifs may carry strong emotional resonance for some recipients, while for others, their significance might remain purely decorative. This ambiguity can be a strength, inviting personal connection, but it also introduces variability in interpretation that is harder to account for.

Ultimately, the visual language succeeded in supporting the project's aims of slowing down attention, inviting emotion, and embedding the climate narrative in cultural and symbolic layers. Yet it also underscores the tension between creating emotional depth and maintaining communicative clarity, an ongoing challenge for any visual project that attempts to hold both data and feeling in the same frame.

4.4. COHERENCE AND CONTRIBUTION

As a whole, *A Week of Climate Connection* represents an attempt to hold together multiple concerns that are often addressed separately: data and emotion, local culture and global crisis, slowness and urgency. Evaluating the coherence of the project involves asking whether these threads have been successfully integrated, not to create resolution, but to allow for layered, situated engagement with climate issues.

The emotional arc, visual language, and analog format work together to support a unified tone, quiet and reflective. Each decision, from narrative pacing to symbolism, was guided by the project's intent to invite personal connection rather than command attention. There is consistency in the emotional register across the cards, even as the content shifts from grief to hope to collective responsibility. This consistency helps hold the project together as a coherent whole.

Culturally, the project is rooted in place. It speaks in visual and symbolic references that resonate within a Portuguese context, while simultaneously addressing a global issue. This duality, of local anchoring and global relevance, is one of the project's more unique contributions. It shows how climate communication can be both emotionally intimate and culturally specific, without sacrificing urgency or scale.

The project's contribution lies not in novelty of form or technology, but in its re-framing of what climate communication can feel like. Rather than shocking, mobilizing, or overwhelming, it proposes a slower, quieter form of engagement, one that foregrounds care, memory, and attention. It suggests that climate awareness is not only a matter of knowing more, but of feeling differently.

By combining emotional design with cultural references and material tactility, *A Week of Climate Connection* offers an alternative mode of engagement, less about delivering answers, and more about creating space for reflection, resonance, and presence.

4.5. FINAL REFLECTIONS

Reflecting on the development of *A Week of Climate Connection* reveals that the project's value lies not only in its final form, but in what was discovered through the process of making. Each design decision, whether pacing, symbolism, format, or tone, opened new questions about how climate communication can be reshaped through emotional and cultural lenses.

Rather than aiming for universal resonance, the project embraced specificity: of place, of form, and of feeling. This choice allowed the work to remain grounded while still addressing a global issue. It also demonstrated that slowness, care, and reflection are not opposed to urgency, but may be necessary complements to it.

The project does not claim to solve climate communication's challenges. It does, however, suggest that creating space for emotion and locality can offer a different kind of connection,

one that prioritizes presence over persuasion. This reframing invites others to consider not just what is said about the climate crisis, but how, where, and with what affective intent.

Future directions could include testing the postcards in real-world settings, adapting the format for other cultural contexts, or exploring more interactive or participatory forms. But even in its current form, the project offers a quiet proposition: that climate communication can be not only informative, but intimate. That it can ask not only for action, but for attention. And that within the overwhelm, there is still room to feel.

5. COMPARISON

This chapter situates A Week of Climate Connection within the broader landscape of data storytelling, emotional climate communication, and participatory design. Its aim is to assess both the originality and limitations of the project by drawing comparisons with established precedents, ranging from digital-first visualizations and emotionally neutral dashboards to narrative-driven works such as *Dear Data*, *Poppy Field*, and *Show Your Stripes*. Through this comparative lens, the project's distinct contribution at the intersection of data science, climate psychology, and visual design becomes more evident.

5.1. POSITIONING AGAINST TRADITIONAL CLIMATE COMMUNICATION

Conventional climate communication, particularly from institutional or scientific bodies, often privileges rational clarity, relying on charts, graphs, and bullet-point summaries. While these methods are technically accurate, they tend to underperform in public engagement by overlooking the emotional and cultural lenses through which people interpret information.

By contrast, *A Week of Climate Connection* takes a different stance. It does not ask its audience to analyze; it invites them to feel. Rather than relying on cognitive persuasion, it foregrounds emotional resonance, embodied experience, and cultural specificity. This approach aligns with research in neuroscience and psychology, which suggests that people act more decisively on what they feel than on what they know.

Traditional strategies also tend to overlook affective states such as eco-anxiety, climate grief, or emotional numbing, emotions that often emerge in response to environmental information. This project, however, validates those emotions and weaves them into its narrative structure. By treating discomfort as a stage in a process rather than a failure of engagement, the project fosters greater psychological accessibility. It reframes engagement not as a purely rational act, but as an emotional journey.

5.2. AFFECTIVE DESIGN VERSUS DATA OBJECTIVITY

Projects like *Show Your Stripes* (Hawkins, 2018) popularized the idea that visual simplicity can effectively communicate climate data. These color-based, abstracted graphics succeed in part due to their aesthetic minimalism, clarity, and viral potential. However, they remain largely unidirectional: designed for viewing, not for interaction.

In contrast, *A Week of Climate Connection* offers an affective and participatory format. Distributed across seven days and designed for tactile interaction, it encourages slow, active reflection. The project extends beyond minimalism to incorporate cultural symbolism, hand-drawn textures, and embodied prompts. While *Show Your Stripes* distills decades of data into a single, static image, the postcard series decomposes this data into emotionally paced segments, each tied to a specific dataset and daily theme. This modular structure mirrors how humans tend to process complex emotions: gradually, over time.

5.3. Comparison with Narrative Data Projects

Projects such as *Dear Data* and *Poppy Field* have become touchstones for narrative data visualization. *Dear Data* is particularly relevant for its analog format, weekly rhythm, and embrace of *"data humanism".* However, it focuses on personal behavioral data, while *A Week of Climate Connection* applies a similar ethos to collective, environmental datasets, scaling introspection from the individual to the society.

Where *Dear Data* builds intimacy between two individuals, the postcard series seeks to create a shared yet personal experience among a broader public. It adapts personal storytelling into a civic ritual, emphasizing subjectivity without losing coherence.

Poppy Field, which visualizes war fatalities through symbolic floral imagery, exemplifies how metaphor can coexist with statistical gravity. Likewise, this project uses visual motifs such as tiles, footprints, and native plants to explore themes of grief, hope, and responsibility. What sets it apart is the use of distinctly Portuguese cultural references, rooting the emotional register in place and identity. This creates a visual that is both specific and resonant.

Both *Dear Data* and *Poppy Field* share this project's belief in metaphor, imperfection, and the hand-made as tools for humanizing data. What *A Week of Climate Connection* adds is temporal sequencing: a structured emotional calendar that supports reflection, one day at a time.

5.4. Participatory Climate Tools

Recent participatory tools, such as *Letters to the Future*, climate storytelling workshops, and speculative design games, have shown the value of inviting people to become co-narrators of climate futures. Many of these projects center on imaginative dialogue or speculative scenarios. While this project shares that, it grounds itself in environmental data. Rather than abstracting from evidence, it begins with facts and layers emotional narrative atop them.

Crucially, the postcard series introduces a structured rhythm that makes participation both accessible and sustained. It invites to slow reflection, rather than a one-off experience. This temporal pacing supports emotional processing and encourages daily engagement without emotional burnout.

By requiring physical interaction with analog materials, the project also activates what material culture scholars call "tangible cognition" – the idea that memory, emotion, and attention are supported through touch and material presence. This embodied participation sets it apart from many speculative tools that remain purely conceptual or digital.

5.5. Comparative Limitations and Opportunities

Viewed in comparison with digital dashboards and large-scale campaigns, the project has clear limitations. It does not offer real-time updates or interactive data layers, and it prioritizes

depth of engagement over breadth of information. This may limit its utility for decision-makers or those seeking comprehensive datasets.

Likewise, the analog format, while emotionally resonant, presents logistical challenges. Physical production and distribution limit scalability and accessibility, especially across geographies or socio-economic contexts.

Yet these same constraints suggest new opportunities. The analog format could be adapted for use in educational programs, museum exhibits, or community workshops. Hybrid formats, such as augmented reality layers, interactive PDFs, or digital journaling platforms, could preserve emotional depth while expanding reach. The project's strong conceptual framework offers a modular foundation for future experimentation.

5.6. SYNTHESIS

While many climate communication projects focus on either emotional storytelling or data visualization, *A Week of Climate Connection* attempts to bridge the two. It occupies a hybrid space between affective design, empirical evidence, and cultural narrative. Its analog format, emotional pacing, and thematic coherence distinguish it from its peers.

By inviting users not only to see climate data but to feel it, the project represents a shift in how environmental communication might operate, less as a broadcast of facts, and more as an invitation to emotional agency. Its strength lies in this integrative approach: balancing emotional accessibility with data credibility, cultural specificity with universal themes.

This comparison affirms the project's originality and positions it as a valuable contribution not only to climate design, but also to broader conversations around emotional literacy, "data humanism", and participatory futures. As climate communication continues to evolve, interventions like this suggest that the most meaningful forms of engagement may not be the fastest or loudest, but the most emotionally intelligent and culturally grounded.

6. CONCLUSION

A Week of Climate Connection sets out to explore how climate communication might feel different if approached through emotion, culture, and material care. Through the development of a seven-day postcard series, the project examined how emotional pacing, visual storytelling, and physical format could be used to foster reflection, intimacy, and presence in relation to climate data.

Rather than aiming to instruct or mobilize, the project proposed a quieter, slower form of engagement, one that invites recipients to pause, feel, and consider their place within a shared planetary condition. Each decision, from the narrative arc to the use of native plants and local symbols, was guided by a desire to speak not only about climate change, but from within a specific cultural and emotional context.

The process revealed that emotional design, when paired with cultural grounding and analog form, can open new space for engagement, one that resists urgency without falling into inaction. The project does not claim to resolve the challenges of climate communication, but it does suggest that alternative affective strategies can contribute to a broader range of responses.

In contrast to more common climate campaigns that rely on fear, urgency, or behavior-change messaging, often delivered through fast-paced digital media, *A Week of Climate Connection* offers a gentler, slower, and more reflective approach. It does not compete with these strategies, but complements them by creating space for personal resonance, cultural nuance, and emotional complexity, dimensions often absent in traditional messaging.

Future iterations of the project could explore new audiences, expand into other formats or geographies, or include participatory components. But even as a standalone artifact, the project demonstrates that climate messages can be delivered not just with information, but with care.

Ultimately, this thesis argues that the way we communicate climate issues directly shapes how others feel in response, and that in moments of emotional overwhelm, offering gentle, empathetic attention can serve as a powerful invitation to engage.

7. LIMITATIONS

As an exploratory, design-led intervention, *A Week of Climate Connection* has limitations, each of which also suggests opportunities for future development.

First, the absence of formal evaluation reflects the project's emphasis on exploratory design over empirical measurement. While informal peer feedback provided valuable insight into tone and clarity, no structured user studies, behavioral assessments, or emotional evaluations were conducted. This choice aligns with the project's framing as a speculative, practice-based intervention aimed at provoking reflection rather than quantifying outcomes. Future work could complement this approach by integrating validated instruments, such as pre/post surveys, the Positive and Negative Affect Schedule (PANAS), or qualitative interviews, and exploring longitudinal methods to better assess cognitive, emotional, and behavioral effects.

Second, the analog postcard format, while intentionally tactile and reflective, controls scalability and accessibility. Physical production and distribution require resources and may exclude distant or digitally connected audiences. Adapting the framework through digital-analog hybrids, such as interactive PDFs or web-based journals, can preserve material engagement while broadening reach and reducing logistical constraints.

Third, while cultural specificity strengthens emotional relevance, it also limits direct transferability. The series is deeply grounded in Portuguese identity, which may not resonate in other national or regional contexts. To broaden applicability, future implementations should employ co-design methods, collaborating with local communities to re-root data and symbolism in diverse cultural narratives.

Fourth, the emotional storytelling strategy inherently involves risk: dealing with grief, guilt, or anxiety may overwhelm some individuals. While no trauma-informed tools were formally applied in this version, future iterations should carefully calibrate emotional pacing, provide content advisories, and collaborate with mental health professionals. This ensures emotional safety and allows users to process complex feelings without psychological distress.

Finally, the current project targets individual reflection rather than collective or civic impact. While personal introspection is valuable, broader civic engagement requires collective platforms. Future educational or workshop settings should incorporate group discussions, facilitator prompts, and public-facing installations to foster dialogue, shared meaning-making, and collective action.

These limitations do not weaken the project's value, rather, they highlight its role as a prototype. With careful iteration, interdisciplinary collaboration, and strategic evaluation, *A Week of Climate Connection* can grow into a versatile toolkit, adaptable yet grounded, emotional yet evidence-based.

8. FUTURE WORK

Building on the foundations laid in this thesis, future work should focus on scaling, adapting, and empirically validating the intervention. Several key directions emerge:

Empirical validation of the project should involve formal user studies conducted with diverse participant groups to assess emotional impact, memory retention, and potential behavior change. Pre/post surveys and interviews could offer structured insight into emotional resonance and learning outcomes. For future research in more experimental settings, physiological tools such as skin conductance or eye tracking may also help explore patterns of emotional engagement with greater precision.

To ensure cultural relevance and inclusivity, cross-cultural adaptation is essential. Collaborate with international researchers, designers, and communities to localize the framework for different cultural contexts. This could involve translating datasets, integrating regionally specific symbols, and using participatory design workshops to co-create new versions of the postcard series.

Digital integration offers opportunities to expand the project's accessibility while preserving the reflective pacing and emotional depth of the original analog format. Hybrid experiences, such as interactive digital journals, WebAR-enabled postcards, or storytelling apps with feedback loops and options for social sharing, can enhance engagement and broaden the reach of the project, especially among younger or more digitally connected audiences.

The project also has strong potential for educational application. Pilot the project in schools, universities, and community centers as part of environmental education curricula. Educator toolkits, facilitation guides, and group activity formats could support deeper integration and evaluation in pedagogical contexts.

Finally, future development would greatly benefit from interdisciplinary partnerships. Future development would benefit from collaboration across psychology, education, interaction design, public health, and policy. Such partnerships could deepen the theoretical grounding, increase institutional support, and help transition the project from prototype to public tool.

In all of these directions, the core principles of the project, empathy, emotional sequencing, and cultural specificity, should remain intact. The goal is not to generalize but to expand impact through meaningful translation. By continuing to treat climate communication as both a scientific and emotional endeavor, future work can build toward communication strategies that resonate across identities, contexts, and communities.

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