ReefWhisper

Shiny App User Guide

ReefWhisper Home Page

This page introduces the VAST Challenge 2025 - Mini Challenge 3 and sets the context:

🎥 **Embedded Video**

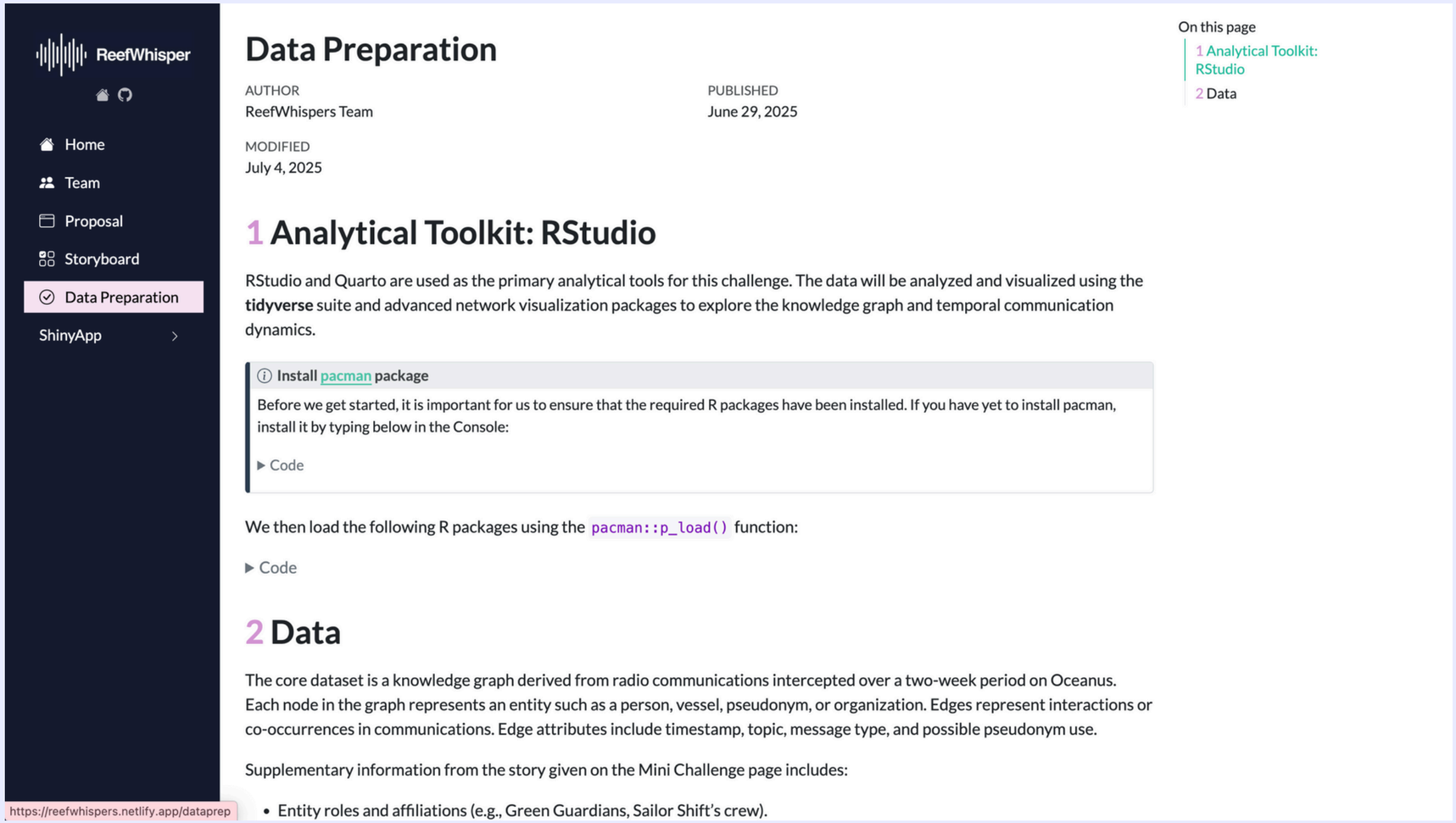
- Watch a short intro video highlighting the environmental stakes and urgency

🧭 **What to Do Next**

Use the sidebar to explore:

- Team – Key players
- Proposal – Investigation plan
- Storyboard – Timeline of events
- Data Preparation – Message cleaning
- ShinyApp – Interactive analysis

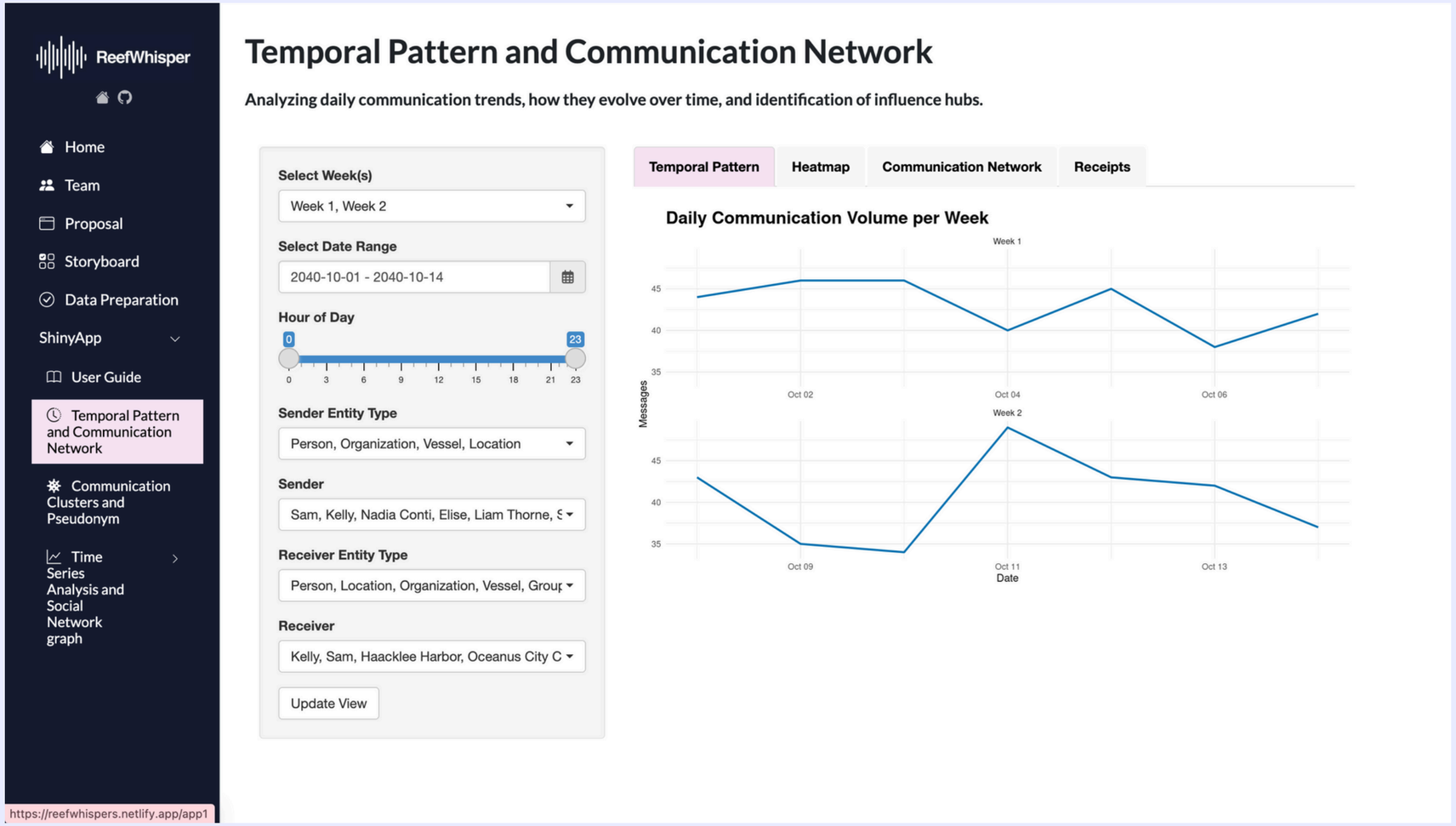
Data Preparation



This page provides the step-by-step data cleaning process to prepare the dataset for analysis

Temporal Pattern and Communication Network

Temporal Patterns



This page analyzes daily communication patterns, explore time-based trends, and identify influential senders/receivers.

🧩 **Filters:**

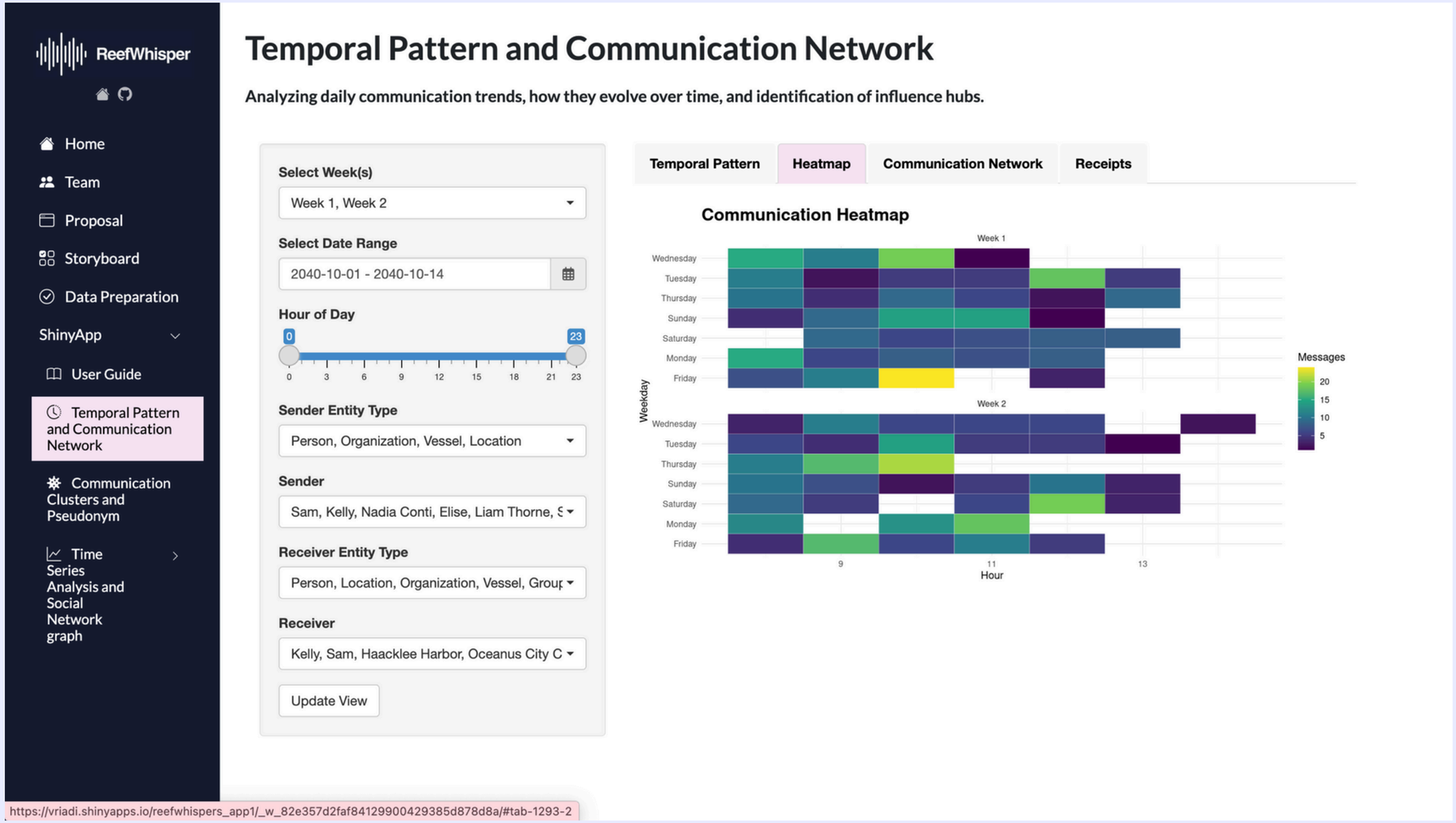
- Week Selector – Choose one or more weeks (e.g., Week 1, Week 2)
- Date Range – Manually select custom dates
- Hour of Day Slider – Filter messages by time of day (0–23)
- Sender/Receiver Entity Type – Filter by type (e.g., Person, Organization, Vessel, Location)
- Sender / Receiver – Select individuals or groups involved in communication

💡 Click other sub-tabs switch

💡 Click "Update View" after adjusting filters to refresh results.

Temporal Pattern and Communication Network

Heatmap



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- Week(s), Date Range, Hour of Day
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- Specific individuals/locations/orgs involved

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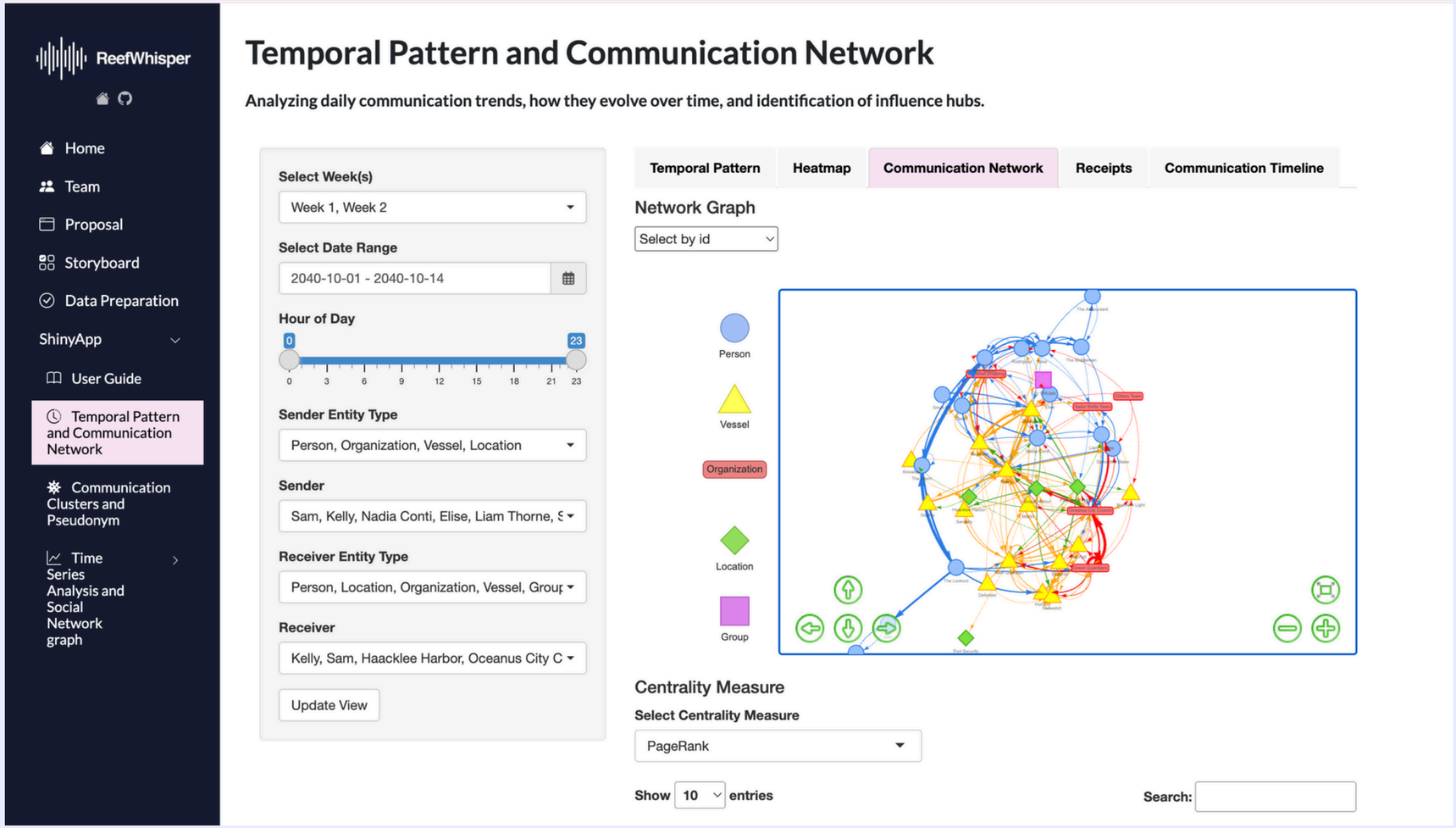
Temporal Pattern and Communication Network

Communication Network (Part 1)



This page visualizes who is talking to whom. Detect key influencers, dense clusters, and isolated groups based on communication flow.

🧩 **Filters (same as previous tab):**

- Week(s), Date Range, Hour of Day
- Sender & Receiver Entity Types
- Specific individuals/locations/orgs involved

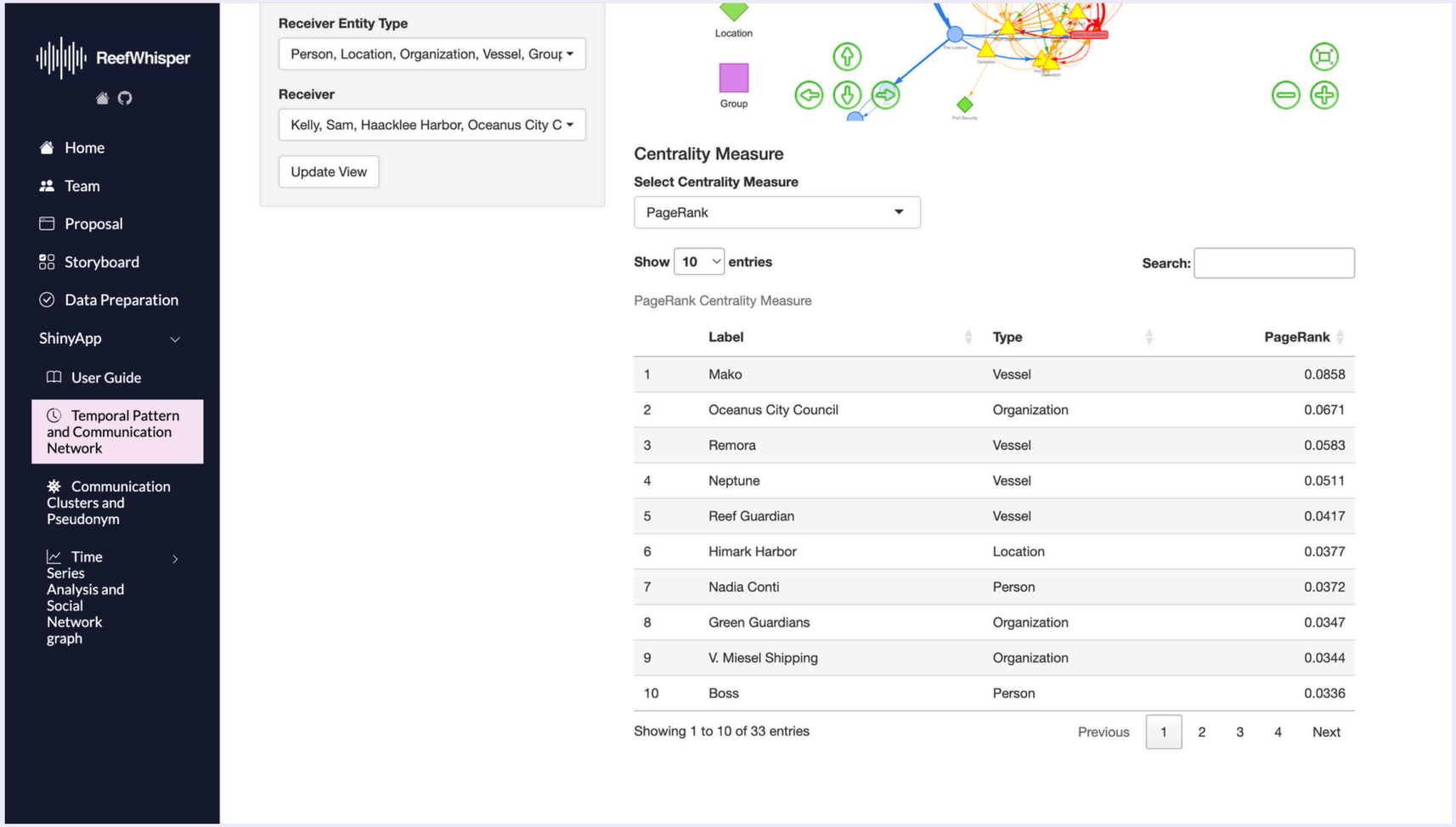
🧠 **Network Visualization:**

- Nodes = entities (people, orgs, vessels, locations)
- Edges = messages sent between them
- Node size = likely reflects activity or centrality
- Color = indicates group membership or role
- Controls: Zoom, drag, pan, and center options

💡 Hover over nodes for ID; use dropdown to highlight specific ones.

Temporal Pattern and Communication Network

Communication Network (Part 2)



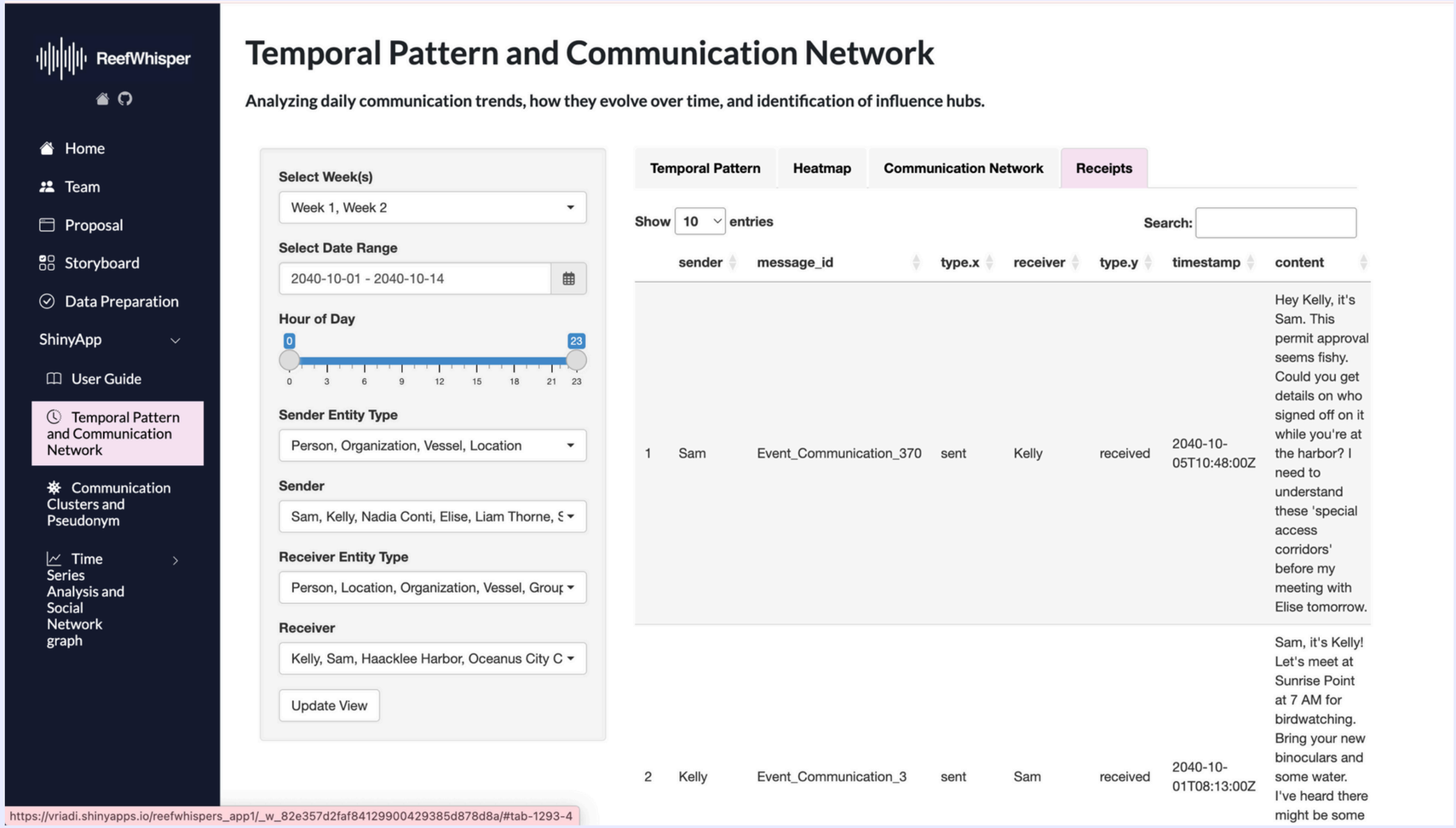
This page analyzes which nodes are most central in the communication network, helping identify influence hubs, active messengers, or information bridges.

Centrality Measure Table

- Choose from centrality types (e.g., PageRank, Degree, Betweenness...)
- Table shows:
  - Label: Entity name
  - Type: Vessel, Organization, Person, etc.
  - PageRank Score: Higher = more influential or connected
- You can search, sort, and paginate results
- Helps you understand who holds influence in the network

Temporal Pattern and Communication Network

Receipts (Message Viewer)



This page reads detailed sender-receiver communications tied to specific dates and times

📋 **Displayed Columns**

- Sender / Receiver – Who sent and who received
- Message ID – Unique identifier
- Type (x/y) – 'sent' and 'received' tags
- Timestamp – Date & time of message
- Content – Full text of the message

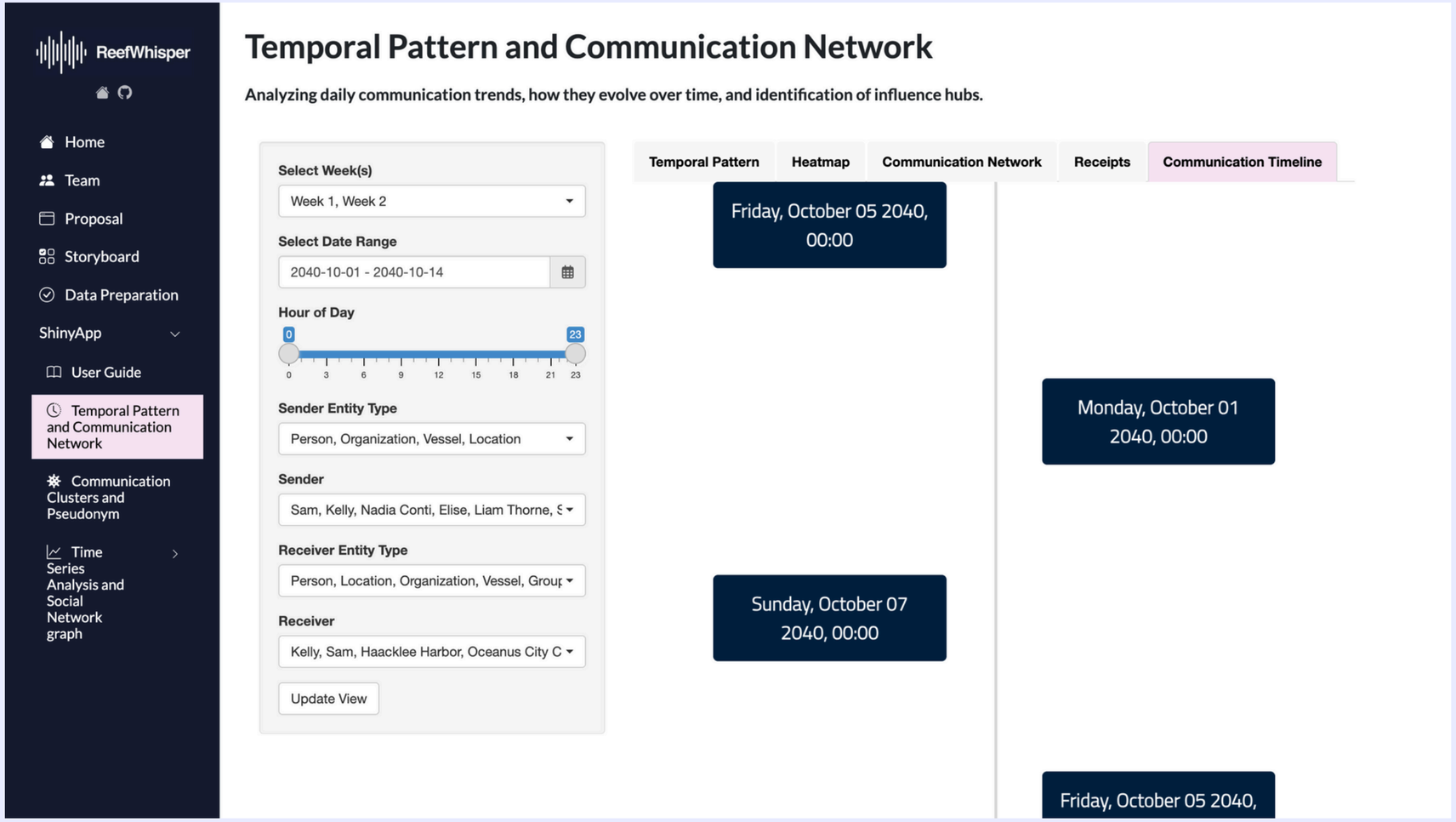
🔍 **Features**

- Search bar – Quickly filter by name or keyword
- Entries dropdown – Choose how many rows to display
- Scroll through to read full conversations
- Filter by date, hour, entity type (left panel)

💡 Useful for reconstructing specific events or building a timeline of suspicious exchanges.

Temporal Pattern and Communication Network

Receipts (Message Viewer)



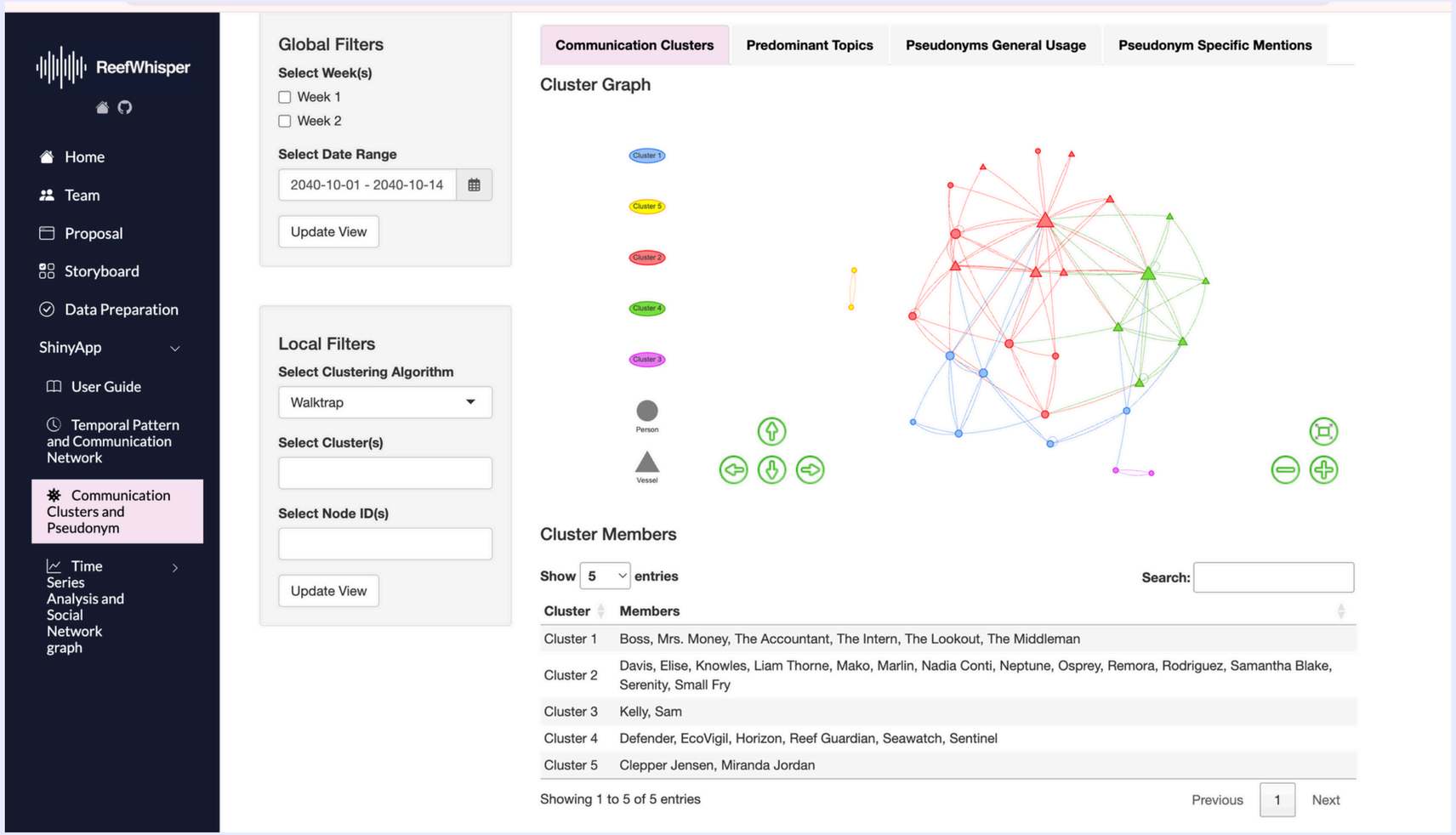
This page visualizes when communication events occurred during the selected period. Helps uncover temporal patterns and key moments of activity.

🧩 **Filters (same as previous tab):**

- Week(s), Date Range, Hour of Day
- Sender & Receiver Entity Types
- Specific individuals/locations/orgs involved

Communication Cluster and Pseudonym

Communication Clusters



This page detects communication communities based on message flow. Useful for identifying tight-knit groups, coordinated actors, or information silos.

Global Filters (Top Left)

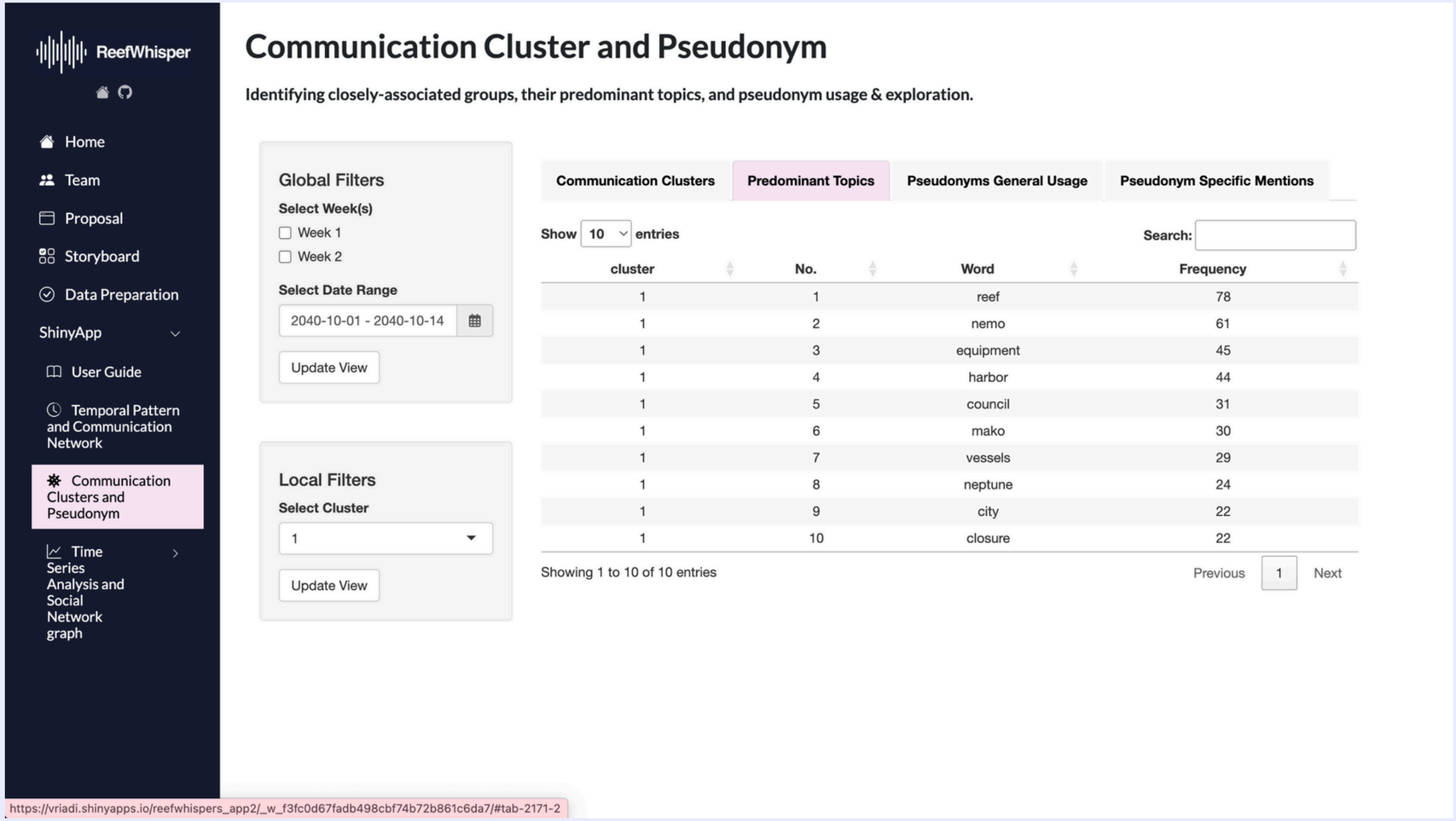
- Select Week(s) and Date Range to focus on a time window
- Click Update View to refresh the network

Local Filters (Bottom Left)

- Select Clustering Algorithm:
  - e.g., Walktrap detects clusters based on message paths
- Select Cluster(s): Focus on specific group(s)
- Select Node ID(s): Zoom into individual users or vessels
- Use Update View after setting filters

Communication Cluster and Pseudonym

Predominant Topics



This page identifies the most frequently discussed topics within each communication cluster.

📋 **Table Display**

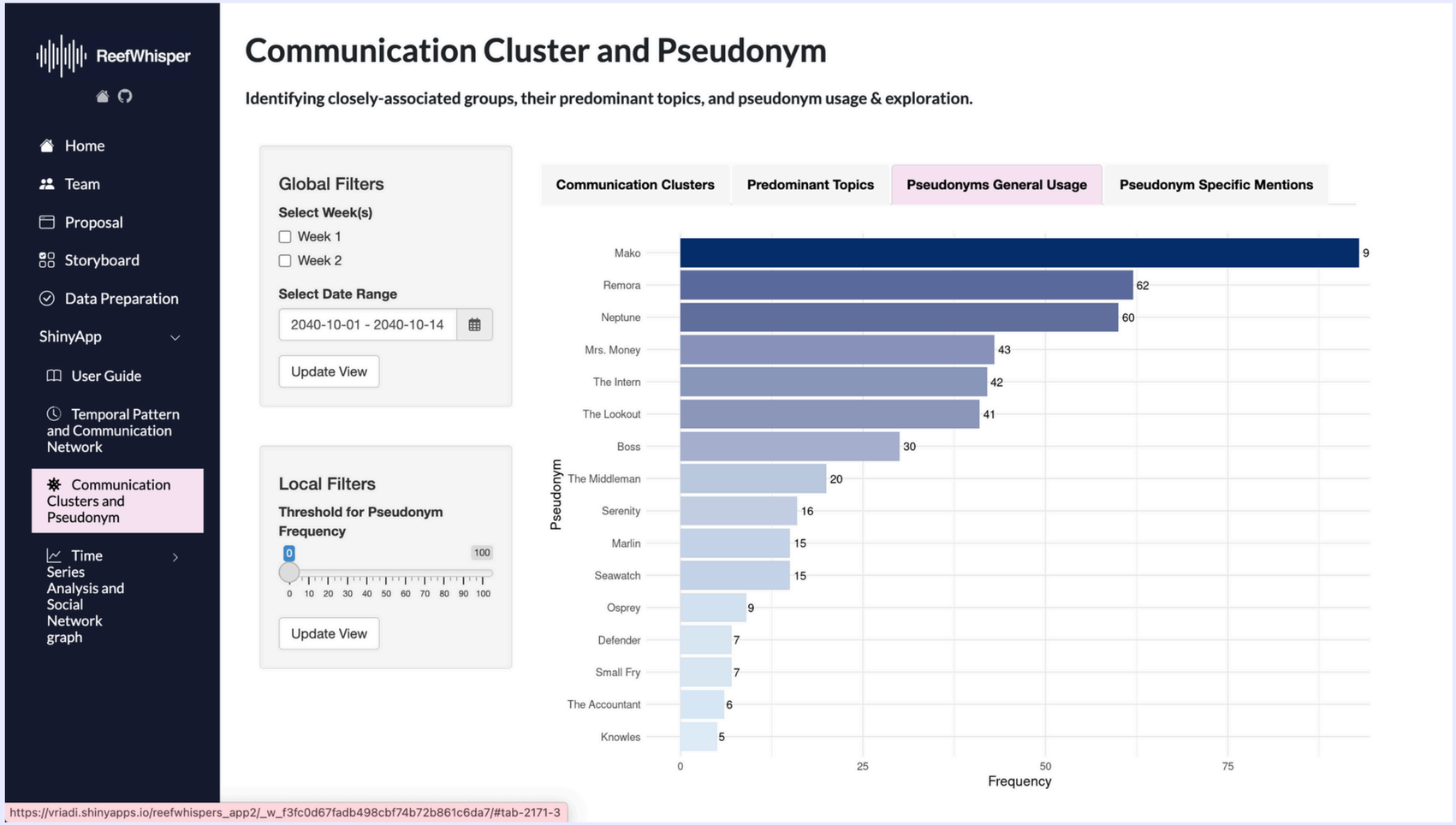
- Cluster – Cluster ID from network visualization
- No. – Rank of the keyword within that cluster
- Word – Frequently used term
- Frequency – Number of occurrences in messages

🔍 **Features**

- Search bar – Filter by keyword
- Cluster selector – Focus on specific cluster topics (left panel)
- Sortable columns – Rank topics by importance or count
- 💡 Use this tab to reveal what each group is primarily talking about (e.g., reef, nemo, equipment, council).

Communication Cluster and Pseudonym

Pseudonyms General Usage



This page tracks how frequently pseudonyms are used in communications across all clusters.

Bar Chart:

- Shows pseudonym frequency (e.g., Mako, Remora, Mrs. Money)
- Sorted in descending order for quick identification of the most active aliases

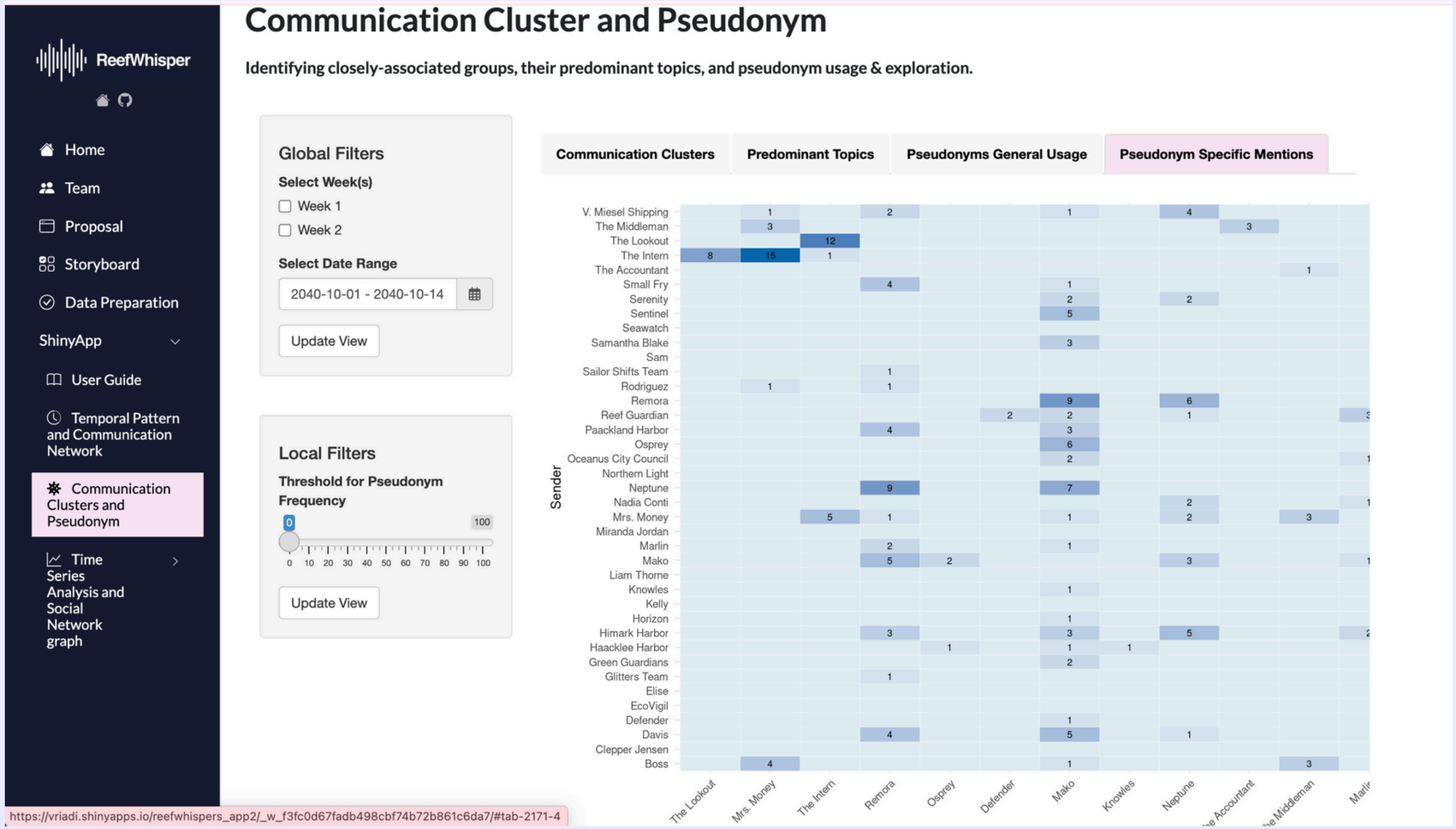
🧩 **Filters**

- Date Range & Week Selector – Filter messages by time
- Threshold Slider – Adjust minimum usage count to focus on high-frequency pseudonyms

💡 Use this tab to flag pseudonyms that may represent hidden or influential actors.

Communication Cluster and Pseudonym

Pseudonyms Specific Mentions



This page reveals who mentioned which pseudonyms, and how often

Heatmap:

- Rows = Senders
- Columns = Pseudonyms
- Cell values = Frequency of mentions
- Shading = Darker = more frequent

🧩 **Filters**

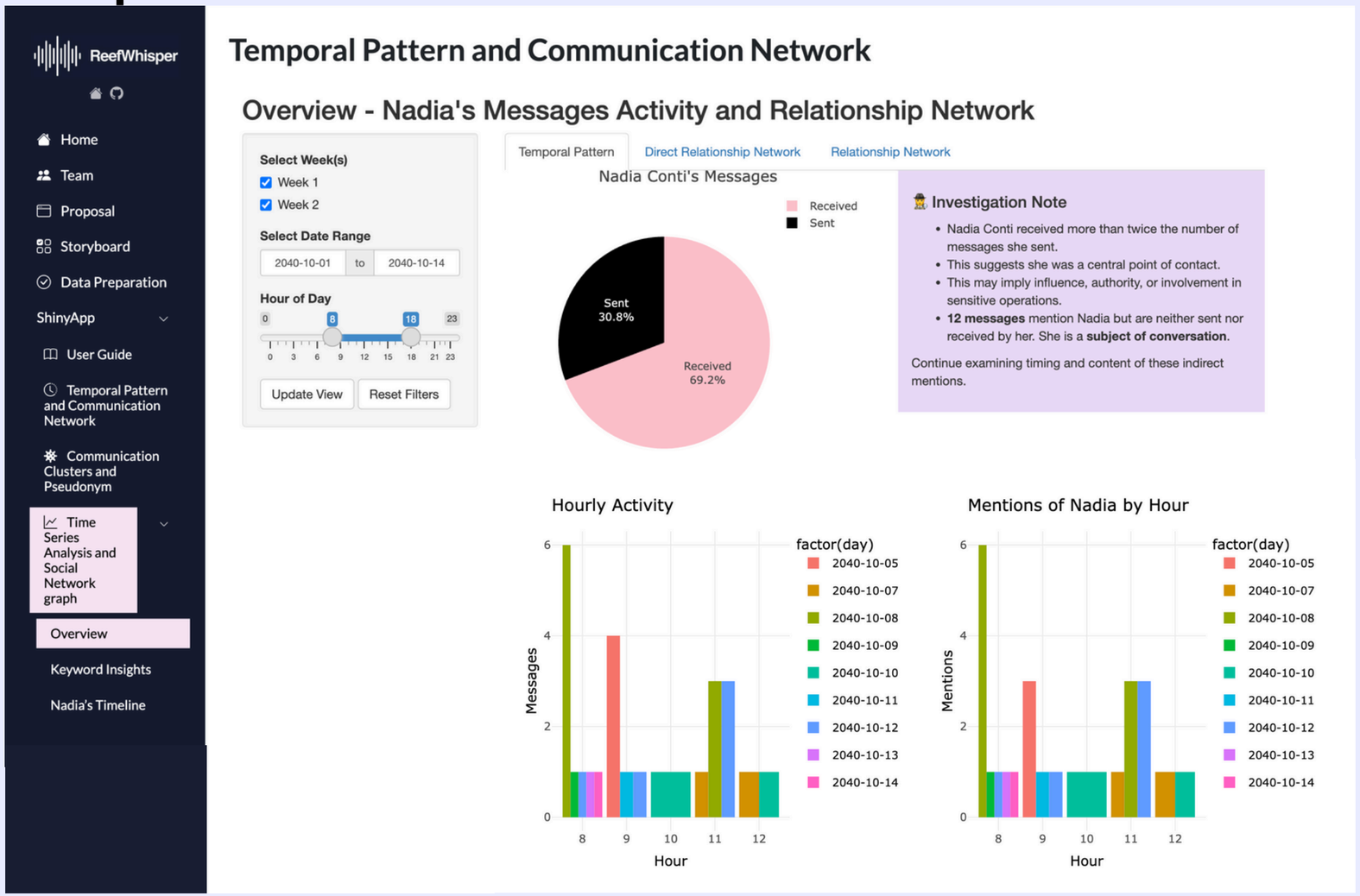
- Date Range & Week Selection
- Threshold Slider – Set minimum mention count

💡 Use this to trace who might know or reference secret identities across clusters.

Time Series Analysis and Social Network Graph

Overview - Nadia’s Messages Activity and Relationship Network

Temporal Patterns



This page explores Nadia Conti’s communication patterns, including messages she sent, received, and when she was indirectly mentioned.

Pie Chart – Sent vs. received messages

- Nadia received 2x more messages than she sent
- Suggests she is a central figure in the network

Hourly Activity Bar Chart – When Nadia was active (by day/hour)

Mentions by Hour Chart – When Nadia was mentioned by others (even if not directly involved)

🧩 Filters

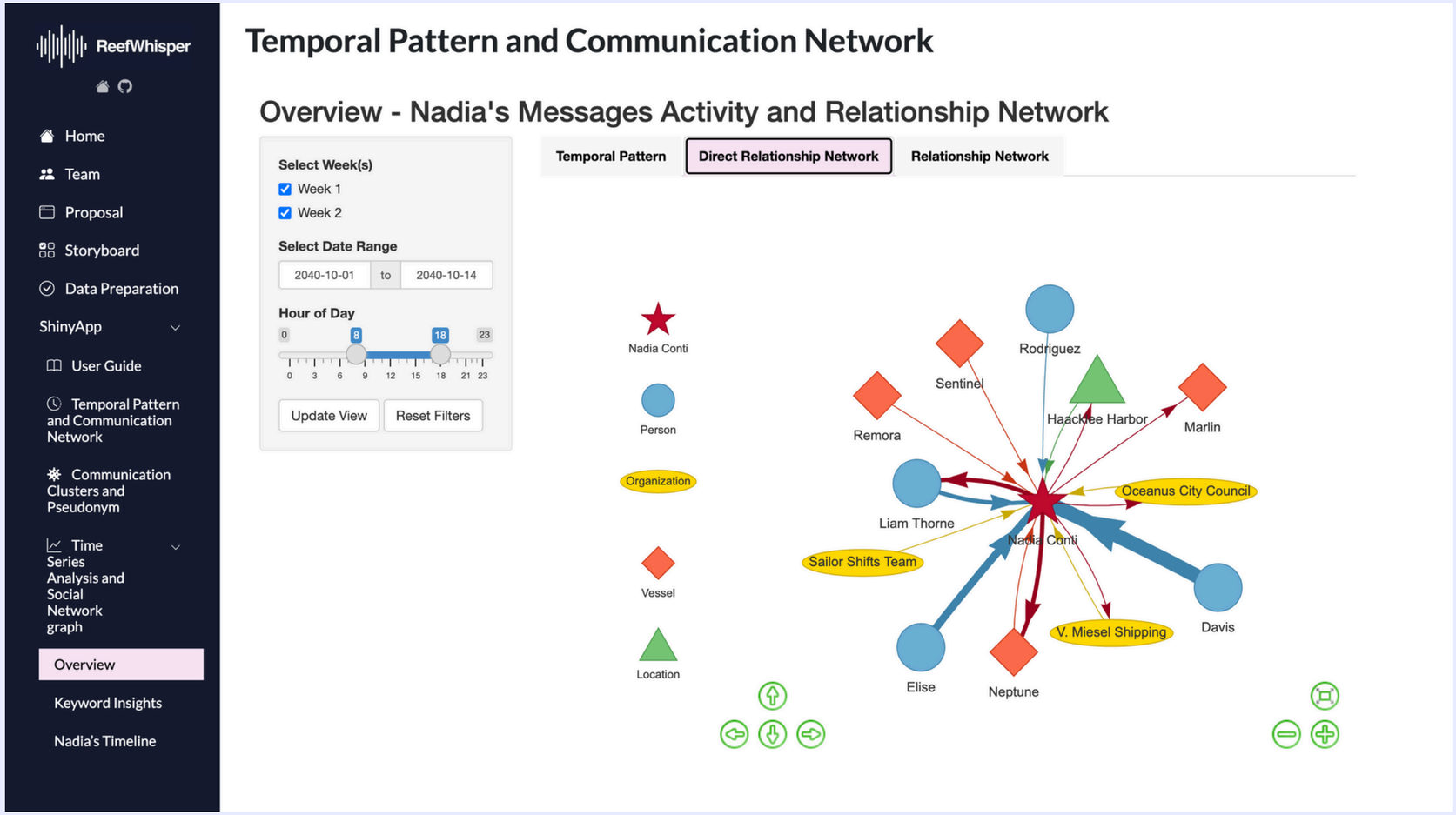
- Week Selector, Date Range, Hour Slider
- Update View / Reset Filters buttons

💡 Start here to understand Nadia’s role and timeline in the communication web.

Time Series Analysis and Social Network Graph

Overview - Nadia’s Messages Activity and Relationship Network

Direct Relationship Network



This page visualizes all connections involving Nadia, including direct and indirect messaging patterns across people, vessels, locations, and organizations.

- Node Colors by entities types
- Arrow Direction: Shows message flow (→ sent, ← received)
- Arrow Thickness: Indicates message volume between two entities

🧩 **Filters**

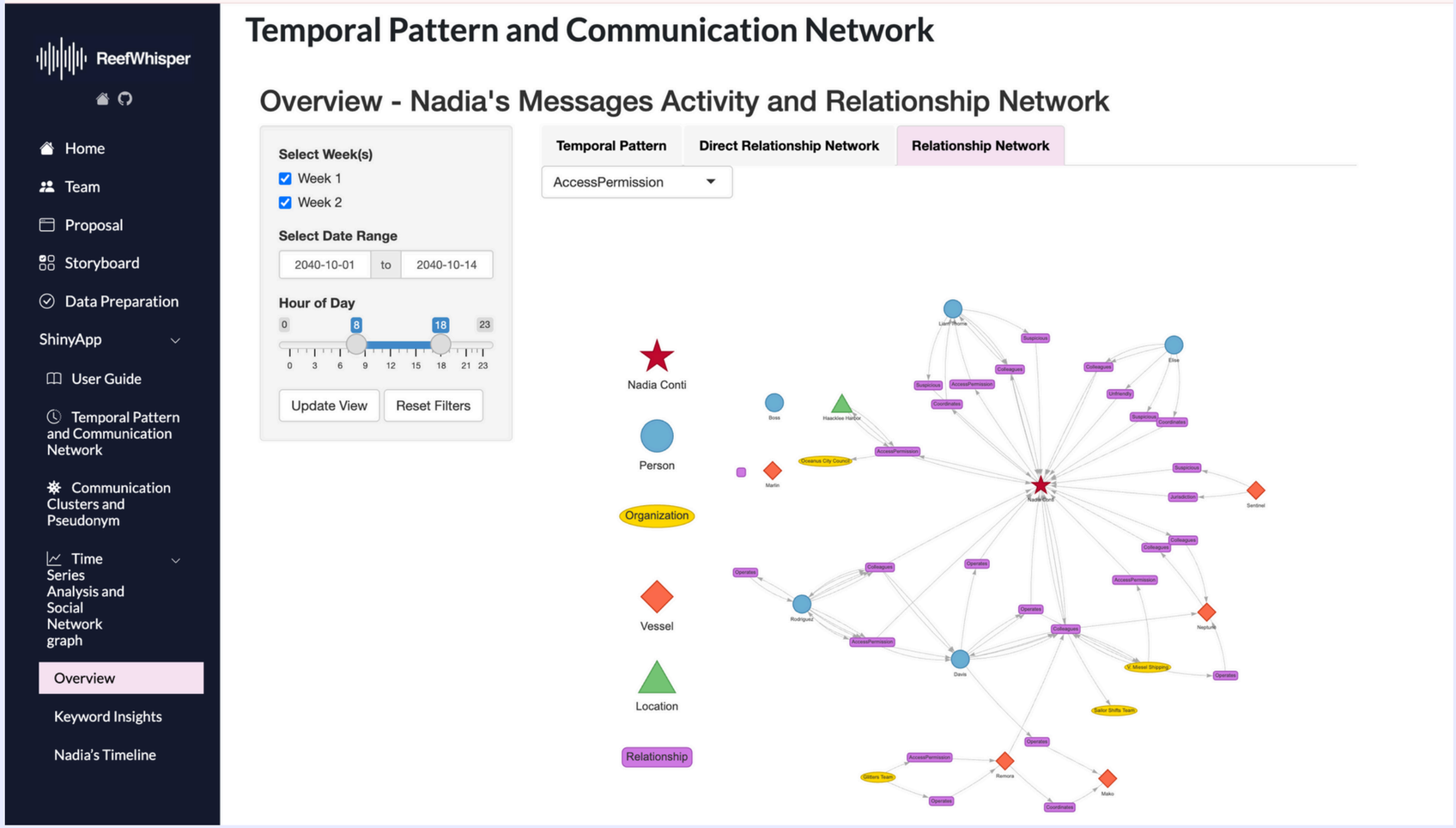
- Week & date range
- Hour of day
- Buttons to zoom, pan, and reset view

💡 Use this view to understand Nadia’s role in the broader network and identify possible alliances or power clusters.

Time Series Analysis and Social Network Graph

Overview - Nadia's Messages Activity and Relationship Network

Relationship Network



This page visualizes explicit relationships and interactions connected to Nadia Conti based on specific attributes (e.g., AccessPermission).

- Nodes: Entities involved (people, vessels, orgs, locations)
- Edges: Labeled arrows indicating direct relationships
- Node Shapes: Entities types

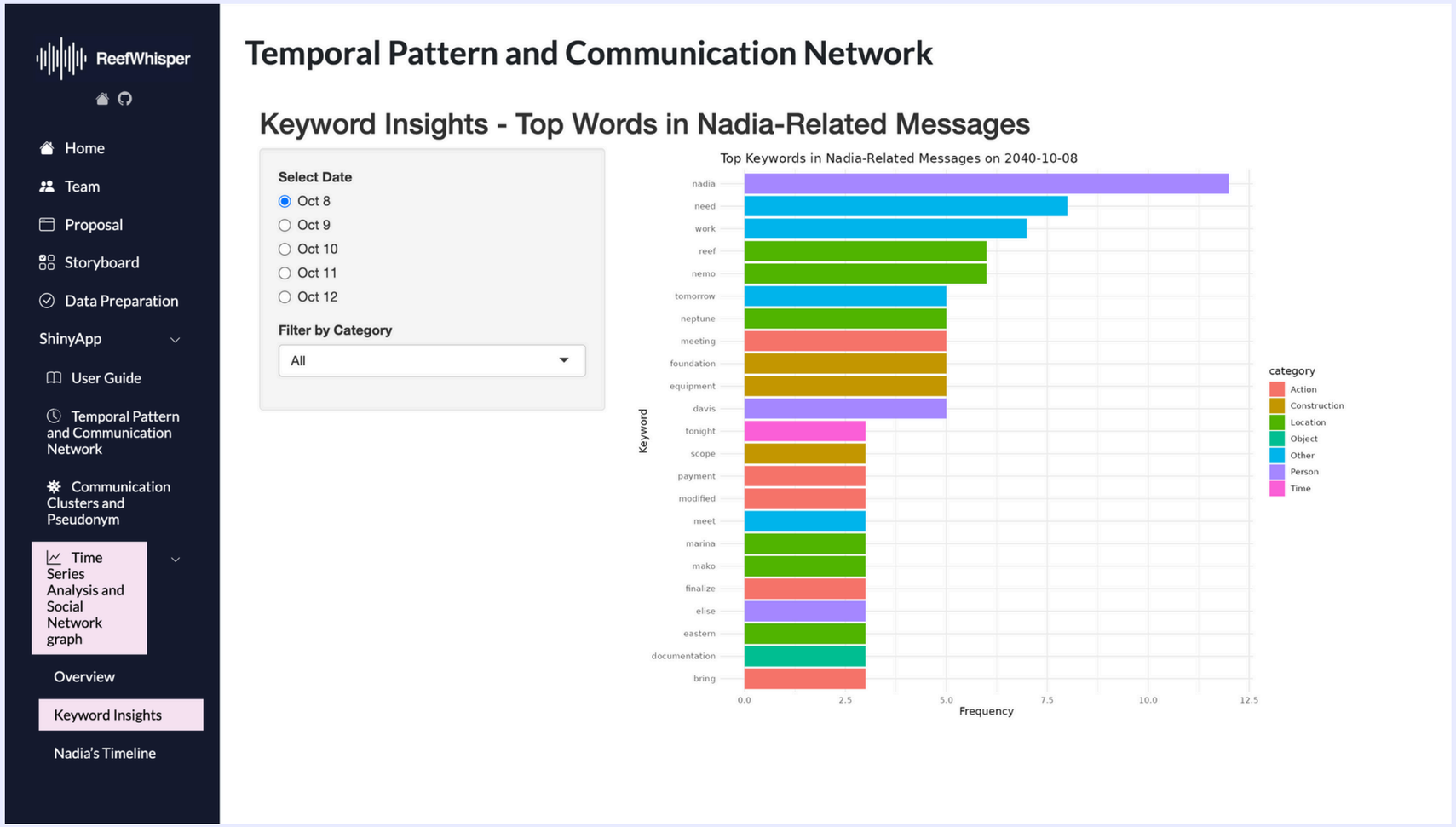
🧩 **Filters**

- Dropdown: Choose a relationship type (e.g., AccessPermission)
- Week, date, and hour filters
- Zoom & pan controls

💡 This view helps confirm how individuals and groups are formally or informally connected, aiding deeper narrative discovery.

Time Series Analysis and Social Network Graph

Keyword Insights - Top Words in Nadia - Related Messages



This page identifies key terms and topics associated with Nadia Conti in message content, by date.

Bar Chart:

- Top keywords in messages that mention Nadia
- Color-coded by Category (legend on right)

🧩 **Filters:**

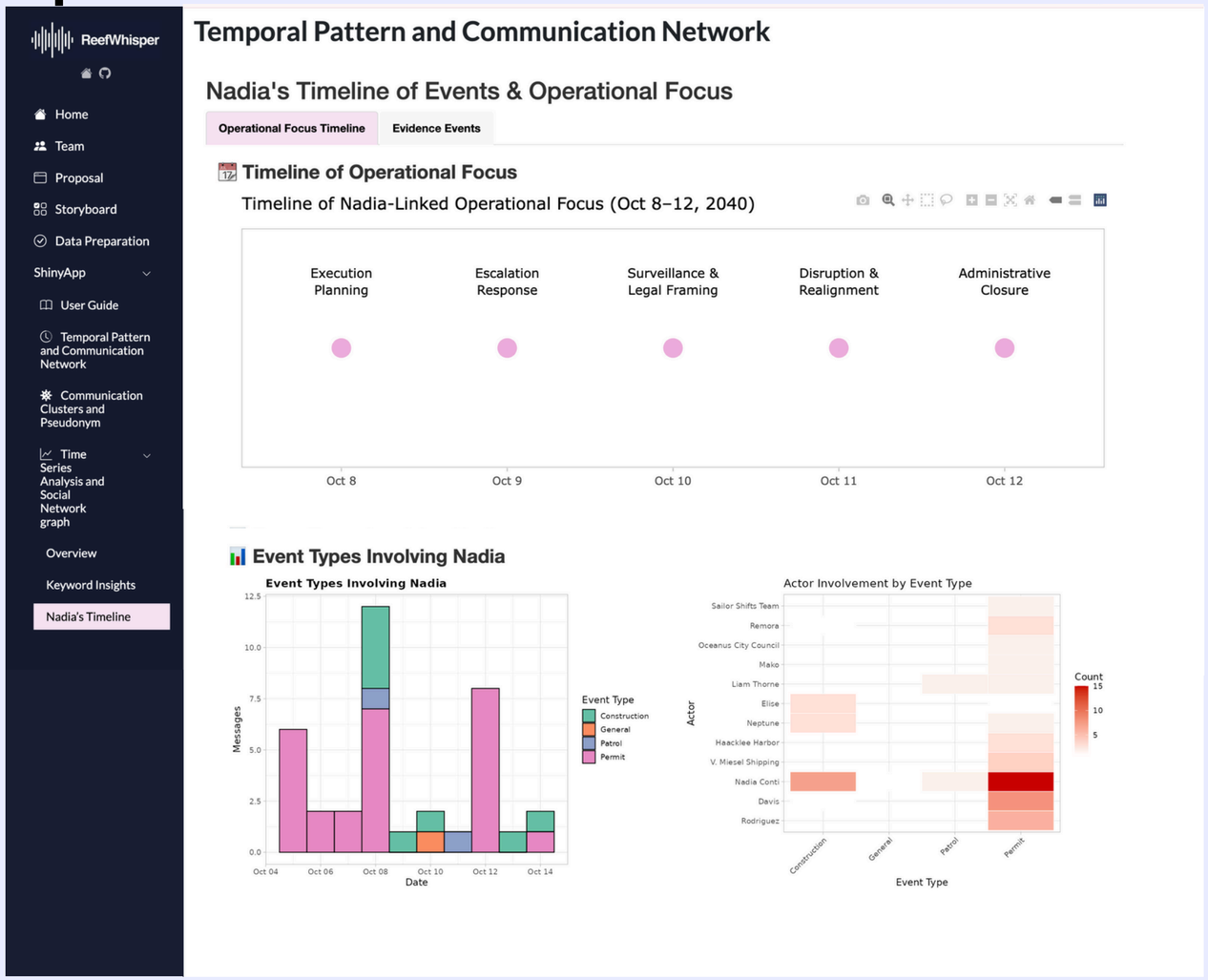
- Select Date – Choose a specific day (Oct 8–12)
- Filter by Category – Narrow keyword list by type

💡 Use this tab to track shifting narratives and detect action-related discussions involving Nadia.

Time Series Analysis and Social Network Graph

Nadia’s Timeline of Events and Operational Focus

Operational Focus Timeline



This page tracks Nadia’s operational involvement across key phases and uncover event types she’s linked to.

Operational Focus Timeline: Visualizes Nadia’s engagement across five strategic phases (Oct 8–12):

- Execution Planning
- Escalation Response
- Surveillance & Legal Framing
- Disruption & Realignment
- Administrative Closure

💡 Dots indicate days linked to specific phases of operation.

Bar Chart: Shows volume of messages by event type (e.g., Permit, Construction, Patrol, General)

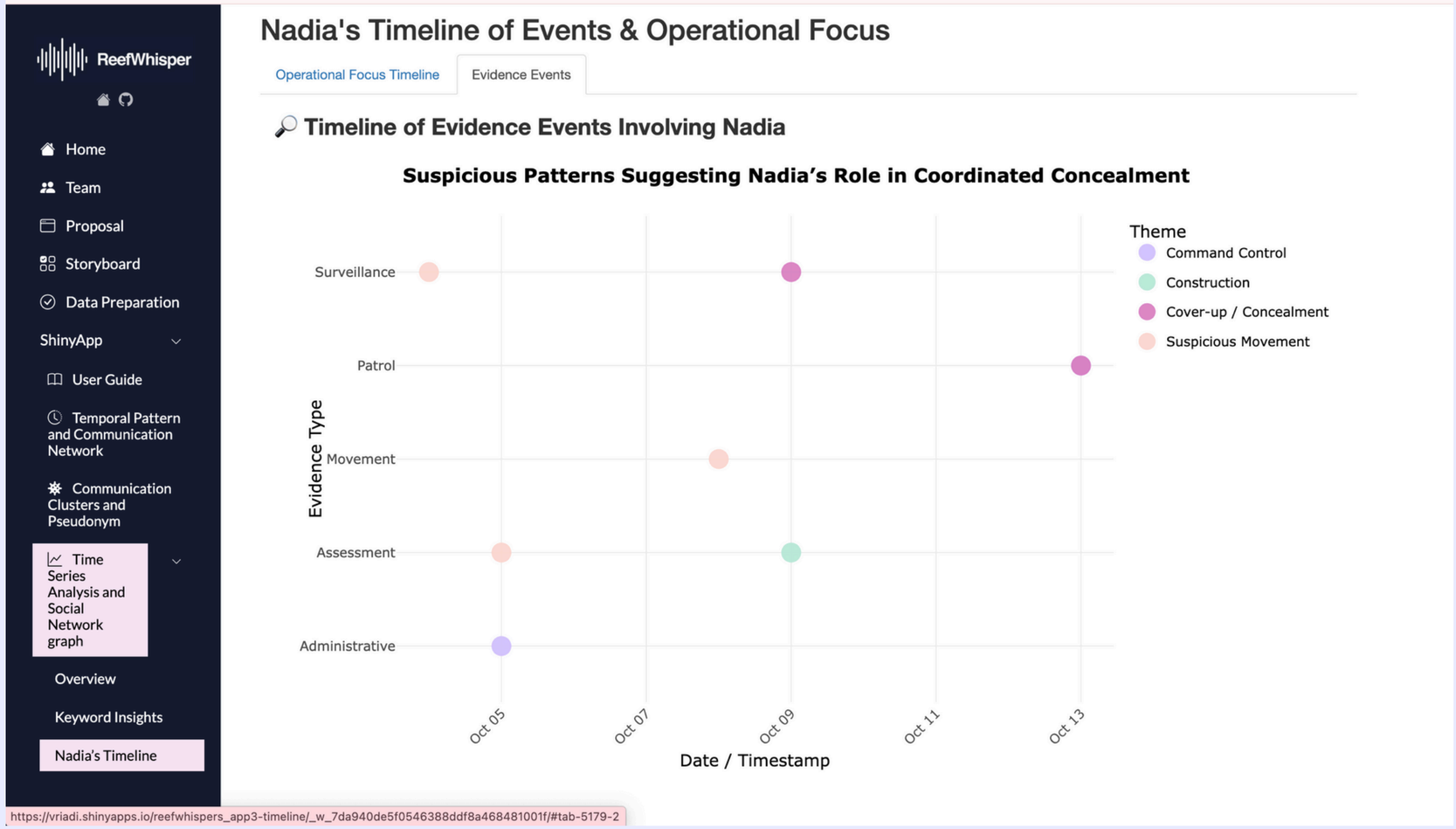
Heatmap: Maps actor involvement across event types

- Darker red = higher involvement
- Helps pinpoint who coordinated with Nadia and when

Time Series Analysis and Social Network Graph

Nadia’s Timeline of Events and Operational Focus

Timeline of Evidence Events Involving Nadia



This page highlights suspicious patterns across different event types that suggest Nadia’s involvement in concealment or coordination.

- **Y-axis:** Evidence Type
  - Administrative, Assessment, Movement, Patrol, Surveillance
- **X-axis:** Date (Oct 5–13)
- Color-coded by Theme

💡 This timeline helps investigators spot temporal alignment of covert actions linked to Nadia.