Trajectory Analysis Planner (TAP)

The Trajectory Analysis Planner (TAP) is a software tool designed by NOAA's Office of Response and Restoration (OR&R) to help oil spill contingency planners prepare for oil spills from the most likely regional locations (e.g., shipping lanes, oil platforms).

TAP helps answer crucial questions in any Area Contingency Plan:

- How do I develop a plan that protects my area against likely oil spills?
- What are the chances that an oil spill from a source in a region will affect a certain resource?
- How long would responders have to respond to a spill successfully?
- How much oil could impact a specific resource?

TAP uses thousands of runs of the NOAA OR&R spill trajectory model, **GNOME**, forced with varying winds and ocean currents in order to develop a statistical view of where oil is likely to go in the event of a spill. This allows for improvements in planning and preparedness for prevention of harm from oil spills.

The TAP tool was previously only available as a desktop application, but is now available as a web application—**WebTAP**—making it much more flexible and easier for planners and responders to access.

Versions of TAP have been developed for a number of locations, which can be found online at the WebTAP site.

How TAP Helps

TAP helps spill planners to:

- Assess relative potential threats to a given sensitive location from possible spill sites.
- Determine which shoreline areas are likely to be threatened by a spill originating from a given location.
- Assess the time in which a response method could be successfully mounted at a given location.
- Estimate the levels of impact on a given resource from a spill.
- Analyze efficacy and shortfalls of response personnel and equipment staging.

TAP draws on a database of thousands of modeled spill trajectories, created using historical wind patterns and both tidal and non-tidal circulation. The TAP interface helps response planners understand characteristics of the probable oil spills in a given region. Understanding these characteristics allows responders to plan not only for one or a few possible high-impact events, but to determine the best overall plan for many events, across the entire spectrum of probabilities and levels of impact.

What TAP Does

TAP presents graphical output in four modes:

- **Shoreline Impact Analysis** helps to answer: If oil is spilled at a given spot, what shoreline locations are likely to be affected?
- **Response Time Analysis** helps you estimate how quickly a response must be mounted at a location of concern to precede the arrival of the oil.
- **Site Oiling Analysis** helps you visualize how a location of concern would likely be oiled by a spill at a given location.
- **Threat Zone Analysis** helps to answer: Where might a spill occur that could threaten a particular location of concern?

How TAP Works

TAP is used to estimate the probability that an oil spill from a likely source will reach a specific segment of shoreline. TAP analyzes statistics from potential spill trajectories generated by the GNOME spill trajectory model. GNOME predicts how an oil spill will spread and move within a local area.

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TAP takes into account:

- The bathymetry (water depth) and shoreline configuration of a particular body of water, including its channels, bays, and significant rivers.
- Currents and winds.
- Shoreline characteristics that determine beaching and refloating of oil.

To develop a TAP dataset, the GNOME model is used to generate hundreds of individual oil spill trajectories from a set of potential spill locations. Then statistics are compiled for where, when, and how much oil could impact receptor sites into data files for the TAP viewer.

TAP displays a map of a specific local area, including a major water body and the adjacent land. The map displays shoreline segments or an ocean grid (receptor sites) that represent the locations of shoreline resources, such as seabird colonies or marine mammal hauling grounds; sites of particular socioeconomic value, such as tourist beaches or large marinas; or areas where remediation measures would be difficult or expensive. You can use TAP to evaluate the probable threat to any of these sites from an oil spill that originates from the most likely sources in the region.
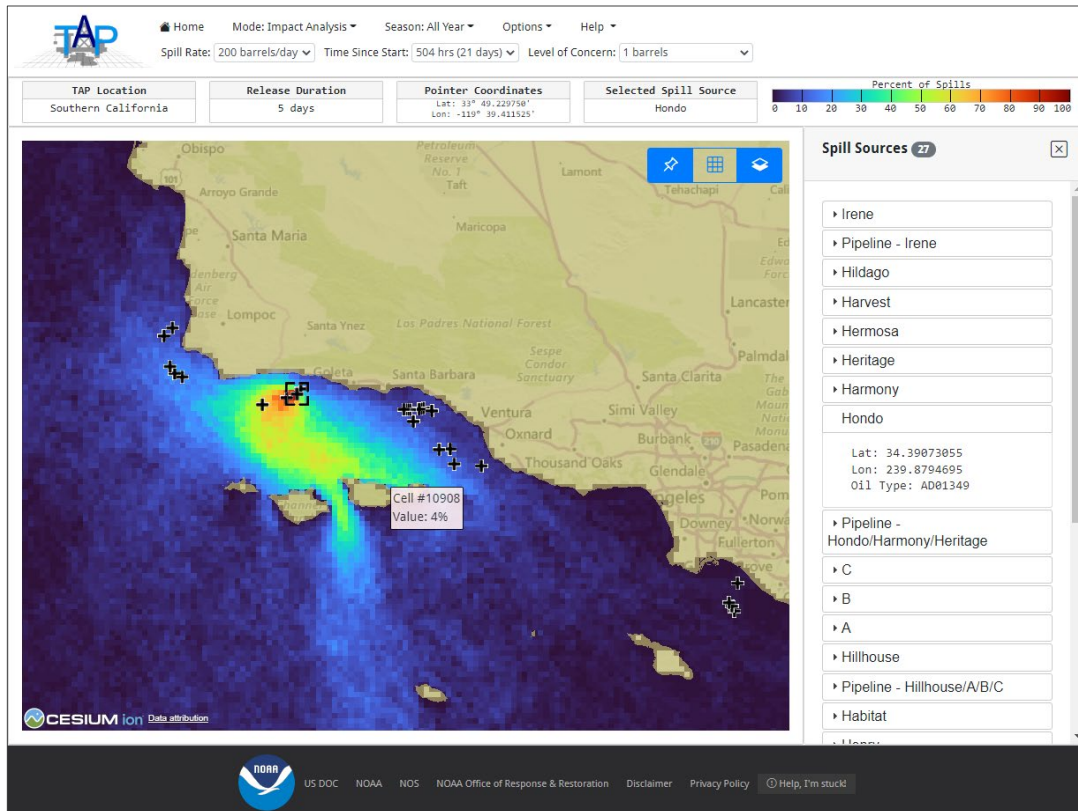
A view of the Trajectory Analysis Planner (TAP) for Southern California in the online WebTAP viewer. The mapped colors represent the likelihood that oil from a specific oil drilling platform will impact a location.

Additional information about TAP and the GNOME suite of oil spill response tools:

- https://response.restoration.noaa.gov/tap or email orr.tap@noaa.gov
- https://response.restoration.noaa.gov/gnome or email orr.gnome@noaa.gov

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OR&R develops scientific solutions to keep the coast clean from threats of oil, chemicals, and marine debris.