



## Data Scientist – Global Fishing Watch

### General Summary

Global Fishing Watch (GFW) is an independent, international non-profit organization that advances the sustainability and stewardship of the ocean by offering, for free, data and near real-time tracking of commercial fishing activity. We also support new science and research and we engage with governments, management organizations, and NGOs to advance the global dialogue on ocean transparency.

GFW processes a global database of vessel GPS positions, several terabytes in size, and applies machine learning models that infer each vessel's type and size as well as when they are likely fishing. GFW is now developing new models, both on these GPS positions and on satellite imagery, to fully reveal activity in the world's oceans. These models include object detection from global feeds of satellite radar and optical imagery, and models that infer, based on vessel behavior, illegal activity and unreported catch. We believe that these new models have the potential to dramatically change the way we monitor and manage the world's oceans.

We are looking for a data scientist to join our research and innovation team to help develop these models. This team works closely with external GFW academic partners to develop models and research, and also with the internal GFW engineering team to scale our methods and put them into production.

### The Position

Working closely with the GFW technical teams, the data scientist will help organize data and build models to understand several global datasets that reveal human activity on the world's oceans. The two key types of data are 1) vessel GPS data and 2) satellite imagery (both optical and radar). A strong ability to work in R or Python is required, as well as abilities to manipulate data in SQL.

The ideal candidate will be excited about working with global data, and will have a high aptitude for learning new techniques. Although it is obviously helpful, we do not expect that you already have a deep knowledge of building models or our key programming languages; we do expect that you have the aptitude to develop these skills and knowledge, and that you are excited about revealing human activity across the global ocean using these tools. Global Fishing Watch values working quickly, innovating, and working collaboratively. Our entire team works remotely, so the ideal candidate is able to manage their own time and be effective with limited daily oversight. Finally, we are passionate about producing research and datasets that will make a difference in how we manage the world's oceans.

The exact projects the data scientist will focus on will depend on the candidate

and other factors at GFW. Possible projects include:

- Helping the machine learning engineers build models to identify fishing vessels from satellite and optical imagery -- experience with remote sensing, and especially synthetic aperture radar -- is helpful
- Combining vessel detections from imagery with vessel GPS detections to identify vessels that are not broadcasting their locations
- Developing models to estimate pollution from ocean going vessels, including noise pollution
- Using vessel behavior to identify vessels that have an elevated risk of using forced labor or engaging in other illegal activity
- Combining vessel tracking data with animal telemetry data (gps devices that have been attached to sharks and tunas) to build models to identify the likely catch and bycatch of ocean going vessels
- Collaborating with the GFW engineering team to automate models.
- Engaging with GFW Research Partners to develop these models and publish peer reviewed papers (the GFW Research Program has produced more than 20 academic papers, including many published at top journals)
- Write blogs and present public visualizations

## **Job Requirements**

### **Required Technical Skills**

- Demonstrated skills with Python or R, with preference for Python
- Strong SQL skills
- Strong mathematical capabilities
- Demonstrated abilities to understand and interpret large datasets, including strong statistical understanding

### **Required Team and Communication Skills**

- Team player, willing to work, teach, learn with/to/from the GFW team
- Proactive mindset – enjoys and exhibits a high-degree of ownership of tasks and projects
- Comfortable working in a small but fast growing organization
- Excellent communication skills – in person, phone, and, most important, written
- Comfortable communicating with a wide range of individuals, including peers, juniors and senior level people, and government officials from multiple countries
- Intellectually curious, forward thinking, willing to suggest / try new technologies and creative approaches to problems
- Ability to work in a remote-only distributed team (in more than 5 different time zones)

Helpful Skills, but can be learned on the job

- Google Earth Engine
- Distributed computation, such as Apache Beam (preferred), or Hadoop, Spark, etc.
- Tensorflow
- Neural networks
- Knowledge about marine science and human impacts on the ocean
- Documenting all knowledge produced so it can be distributed among the organization and to the public

**Location:** GFW has a distributed workforce, with employees all over the world. This position will require the individual to have a time zone that overlaps significantly with California and Buenos Aires, with strong preference for U.S. Pacific, Central, or Mountain time.

**Responsible to:** Research & Innovation Director

**Salary or Compensation:** Commensurate with experience. GFW offers pension/retirement, health and other benefits commensurate with similar level GFW employees in the country of employment.

**Working Hours:** GFW supports flexible working, so the pattern of hours may vary according to operational and personal needs. GFW works across different time zones and weekend work may be required on occasion. Periodic domestic and international travel will be required to meet with team members and for workshops. No overtime is payable.

**Travel:** Currently suspended due to COVID-19. In person team meetings may occur once every few months.

**Holiday:** Paid holiday/vacation commensurate with other, similar-level Global Fishing Watch employees/contracts in the country of employment.

**Equal opportunities:** GFW is an equal opportunities employer and commitment to this process is expected.