IUU Fishing Roundtable Notes

Summary of Proceedings

Notes from meeting conducted at Analyze on June 19, 2013

June | 13

Analyze

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Purpose:

SpaceQuest sponsored a special ½ day roundtable discussion Wednesday (19 June from 1:00 - 4:00) hosted by Analyze in their office in Fairfax, Virginia to discuss data and analytical approaches to the IUU fishing problem.

The objective was to explore how we as a group can combine the capabilities and interests of each of our organizations to demonstrate the contributions our data and advanced analytical techniques can make to identify IUU activities on the open ocean. We purposely avoided policy issues and international cooperation approaches.

Agenda:

1) Each of the organizations had the opportunity to present a short update on what they are doing now to address IUU fishing.
2) Try to identify a meaningful demonstration we could all perform, and the data and analysis needed to implement it.
3) Action items and follow-up

Short Presentations:

- NOAA – David Pearl
  - US imports 85% of consumable fish
  - AIS originally designed for use in collision-avoidance
  - NOAA, Office of Law Enforcement collaborating on problem
  - Complex – so many RFMOs and EEZs all having different regulations
  - • VMS- Vessel Monitoring System - a private commercial service
  - Individual entities must "agree" to participate in VMS – list available online
  - "Dark Targets" – all vessels who do not transmit their location
    - examples: driftnet vessels – Japan – no flag, no VMS, no AIS…
    - "trans-shipment ("shadowing")…one ship with AIS other right next to it with NO AIS…
    - Vessels that change names – pass themselves off as a legal one
  - Port Entry – restrictions, inspections, denial port services
  - "Port State Measures" Pew / NOAA working to get this established
  - Vessel Tracking Tools
    - (check into) Lloyd's List Intelligence

- PEW Trust - Meaghan Brosnan
  - Tony's apology that he couldn't participate today
  - Meaghan will head up this initiative (Tony is her boss)

- o Securing Port State Measures through regional – ID of bad actors
- o This technical collaboration comes into every aspect of PEW's campaign
  - Pew brings several different focus locations for technology applications / demonstrations
  - Great communications department ready to advertise successes we all can bring to the problem domain
  - Other campaigns within PEW – Global Ocean Legacy – protection
  - Sharks and Tuna Campaign – secure laws to protect species
  - Illegal Fishing is focal point for technical to enable detection
  - Meaghan will take information from this group to all three campaigns

- ORBCOMM - Greg Flessate
  - o M2M sat com
  - o 29 satellites constellation – 800,000 assets being monitored, primarily heavy equipment and transportation – and data communications
  - o Greg runs Gov and Maritime business
  - o M2M comms to support VMS (ORBCOMM is approved supplier)
  - o Service other vessels monitoring assets – may be for other than fishing vessels
  - o Orbcomm supports LRIT
  - o In process to launching additional 17 Orbcomm satellites – all with AIS capability, available by end 2014
  - o 16 Earth stations to download AIS data
  - o CHALLENGE – access to AIS and VMS – often different people have access but not often that some can have access to BOTH.
  - o Stove-piped access is an issue.
  - o Intel Community, NOAA may get 2nd priority to IC... just the way it is.
  - o ORBCOMM usually sells / provides data to 2nd tier value added reseller (who integrates, modifies, processes data for customers)
  - o Currently working with IHS
  - o Their machines currently do M2M communications – other partners would have the SAR, EO/IR

- IHS – Richard Veale
  - o AIS live – terrestrial AIS stations (ground based) to track vessel transport in UK
  - o Expanded – many partners
  - o 1,200 receivers worldwide – all send info to central database
  - o Work with ORBCOMM
  - o Terrestrial data close to real-time; space-based data has latency.
  - o Lloyd's Register of Ships – 180,000 vessels – over 99 gross tonnage (GRT) engaged in international trade (First publication was 249 years ago!)
  - o IMO identification –
    - self-propelled; non-wooden vessels
    - government vessels not required

- - fishing vessels currently are not under IMO, but work underway to change this to be considered in the IMO numbering scheme.
  - Currently have over 20,000 vessels in their database. Anything from 5,000-30,000 estimated YET TO BE incorporated with IMO identification into this database.
  - PEW has an objective to have IMO on all vessels over 100 tons.
  - Critical to have the owners / registration information to enable prosecution

- GREENLINE Systems - Paul Kerstanski
  - Risk Reduction
  - Work with ORBCOMM, SpaceQuest, GreenLine, IHS and others
  - 125,000 ships at sea at any given 24-hour period.
  - They run all AIS data through their processor – Red, Yellow, Green assessment levels. Anything under 99 GRT.
  - Automatic Email Alert Systems
    - "Trip Wires" – geographic (e.g. drug routes, EEZs for Africa)
    - Alert countries of vessels scheduled to arrive in a country
    - Atlantic Collaboration Group – UK, Canada, US (VA) –
    - NOT a tracker – GreenLine is an analytical tool
    - They have a Small Boat Data Base (under 100 GRT)– Canada Great Lakes area – estimate 116M pleasure boats
    - [IDEA – Could we get access to this database for further analytics processing to identify potential "bad" small boats in the Great Lakes – US/Canada border?]
    - "91/181" – Lat/Long … when AIS transceiver is not connected to the GPS receiver.

- SKYTRUTH - John Amos
  - Non-profit working in environmental space – remote / satellite sensing, image processing and analysis and other types of data; Paul Woods is their CTO.
  - Currently working with Meaghan at Pew and her colleagues
  - IUU "information problem" (here in this case – fishing)
  - Managing the problem once you have the data – Pew has primary role here.
  - 12-month long monitoring - Pacific combining satellite radar and AIS data correlating two data types. AIS broadcasting data LEGAL and other large vessels that do NOT broadcast AIS data. Many are fishing where illegal; some are travelling through.
  - Cannot infer anything about their BEHAVIOR – already working with (?) to learn about what constitutes "fishing behavior"

- WINDWARD – Ami Daniel
  - Co-founder and COO of Windward
  - Switzerland and Tel Aviv Offices

- o Marine Intelligence – "MARINT"
- o MD has entered the information age – agrees with Paul on "It's not about what you see , but what does it look like"
- o Not a single event in one place at one time – but what is happening
- o Trying to "close the circle" to provide a complete solution
- o Fishing problem is not only on the sea – it is a start but not the end. Must tackle the whole chain.
- o Many stakeholders
- o A Key Question is "Who Cares?" US may care about US fishing areas, but who cares about IUU in other country areas – e.g. East Africa, etc. All affect global community
- o How do we tackle this globally? Isolate problem and look for ways to add value….
- o Who cares enough to tackle this? Police Issue? Coast Guard Issue? Fishing Issue?
- o What's the first step?
- o Who cares enough?
- o Technology – take it piece by piece – problem is too large to tackle as a whole.
- o What is the first challenge we could tackle to make a change?
- o Who are the relevant stakeholders to whom this matters?
- o How do we tackle issue of illegal fishing in Mozambique when you need to stop it in Japan?

- GOOGLE OCEANS – Jennifer Austin Foulkes
  - o How Google tools could be used to address MDA – and illegal fishing
  - o Gap in ability of broader world to see what is going on in oceans
  - o Lack of will to collaborate on technologies. - believes we need to
  - o On brink of putting all AIS data in Google cloud to allow access by many for opportunity to process and make meaningful for more effective MDA
  - o Input on how do we help with Google tools? Are there other data sets we could get and other stakeholders.

- ANALYZE – Ed Lorenzini
  - o Big data advanced behavioral analytics company
  - o Analyzed fishing behavior in the Pacific
  - o Identified characteristic fishing behavior using 1.5 years of historic AIS data
  - o Teamed with The Terramar Project to get out the word on Illegal Fishing and shared research results with their environmental constituency
  - o Answering the question: "Who's fishing."

Roundtable Discussion Questions

1) How can satellite (AIS) data contribute to combating IUU fishing?
2) What other sensor data sources are available (e.g. SAR, VMS, EO, other)?
3) What other types of data can contribute to the solution?
4) What analytic solutions are needed to address the problem fully?
5) Is there an un(der)addressed part of the problem best addressed collaboratively?
6) Which region would be best to test the effectiveness of a collaborative IUU fishing solution?

Notes from Discussion:

- o Developing countries do CARE
    - ▪ Primary source of their income
    - ▪ Want to be better and smarter at controlling their waters
- o Topic has popular support
- o • [Windward] More than everything, satellite AIS data enables visibility of ship movements around the world. As such, it monitors the activities of fishing vessels on a global scale, thus revealing a crucial part of the fish processing chain, which could not have been monitored before the existence of S-AIS.
- o Agencies concerned
    - ▪ PEW is developing a framework
    - ▪ Differs from country to country
    - ▪ Maritime Police – Border – Search & Rescue
    - ▪ Example – Indonesia has nine agencies involved in IUU
- o PEW uses AIS to
    - ▪ Enable them to give partner countries a "view" – broad macro (situational awareness)
    - ▪ Identify specific fishing vessels
- o AIS is a general awareness data set and can be used to compel players "to care"
- o [More on "who cares"]
    - ▪ Current state is one mile vs. 100 miles
    - ▪ Specific by country
    - ▪ Those who are willing to do something – level of "political will"
- o If we do this well, we could drive it to a strong market play – compelling companies to "do the right thing" – e.g., use public consumers / customers to compel tuna companies
- o [Windward] The main advantage of S-AIS, as opposed to VMS systems, is that to broadcast AIS does not cost money to the fisherman, other than the installation of the transmitter. Therefore, making AIS transmissions mandatory can prove to be much effective in continuously monitoring fishing activities worldwide. Of course, VMS data is crucial , but is usually reserved for proprietary uses.

- Limitations of AIS data
  - Not all ships use it - especially when it comes to small fishing boats
  - Contains bad data from bad actors, mis-broadcasts, etc.
  - High Density vessel traffic areas are challenging to decode from space
  - Long revisit times with current systems and data latency up to one hour.
  - ORBCOMM using Doppler to detect spoofing – has a patent pending
- • [Skytruth] Fusing with other sensor data using automatic flag checks, pre-processing
- [Windward] There is need for a global database of fishing vessels and their licenses and certificates - much like the FAO database, only much more comprehensive, specifically because one of the major difficulties with fishing most fishing vessels is that they do not have IMO numbers.
- AIS does not currently provide continuous or real-time data which is needed for high density areas & law enforcement
  - Commercial resolution of SAR is low
  - USG "may" have higher resolution (is there any way to obtain?)
- IMINT helps only if you can do it real-time (problem)
  - Maybe use AIS to "cue" other sensors to collect imagery when needed, but resolution must be high enough
  - Potential to obtain higher resolution imagery from Digital Globe or others could be helpful (0.5 meter resolution needed).
  - May need "purpose-built" satellite or mission for this application
- Fishing Database of IMO tagged vessels
  - Example, LNG vessels – data provided to interested parties
  - Run check using this against code of vessel to identify if correct vessel class
- Public sightings programs in some countries– low tech
  - Trawler Spotter
  - Western Africa, Seychelles (where they offer reward $$ for cases prosecuted as result of sighting tip-off)
- Open Source - "ostr.com" - Predictive Services that tell where certain fish species will be – this could be indicator of where legal AND illegal fishing may occur
  - Free service to raw data (?) but requires fee/subscription to obtain simple level of information / identification
- Gear Beacons – GPS equipment on nets
  - Just to know where the nets are would be valuable information
  - Add to other sensor data [Skytruth] – Radio & Satellite
- Fish Aggregation Devices (FAD)
- Need to use behavioral analysis to be able to tell the "entity who cares" exactly what they need to know
- Vessel Classification System, vs. Behavior vs. What's Important
  - Cueing Data for imagery tasking (SkyTruth, etc.)
- Context important and complex
  - There are many different categories of fishing vessel activity. Type of gear, fish species, season, type of vessel, nationality, region, etc.

- Example Indonesia, large vessels often travel and fish in pairs (OK), but in West Africa large vessels travel and fish individually.
- Machine learning systems needed
- [Ami said something said here about not being best use of resources Satellite Cueing, other?.... didn't catch the full meaning]
- Value in history vs. what changes
  - o Ways to capture other information to feed into a model?
  - o Need SMEs in illegal fishing – HUMINT
  - o Specific areas exist where behavioral analytics could be tested , coordinate with PEW and SkyTruth…
  - o "Panda" like capability needed (according to GreenLine). This would perform profiles and ships trends towards that profile…could alert governments…includes fused data…monitor North Sea / all fisheries
  - o Address with Known parameters – fuse and compare / look for intersect – USCG using "Paper UAVs" in the Arctic
  - o Vessels without AIS (<90 GRT)
    - Find them
    - Determine if you care
    - 55% of Mediterranean vessels don't use AIS
    - 35% (?) vessels in China Sea do not use AIS. [confirm this number]
  - o Problems are EXPENSE and ENFORCEMENT

Take-Aways – What did you learn? What ideas are of interest?:

- o "Local Success" will help move the ball forward
- o East-West coordination transposition
- o Vessels over 90 GRT required to have IMO
  - Paves the way to regulatory control
  - Possibility for 5-10 years
- o Meaningful OSINT and HUMINT could be beneficial as additional data
- o All of this connects to the issue of "governance"
  - What is the Business Case?
  - Who will pay?
  - How do we measure effectiveness?
- o Exposure to all components
- o Technical Solutions combined to yield knowledge
- o IHS fishing requirement 2014 & importance of real-time information / results to showcase – have real solutions
- o Crowd sourcing – squeaky wheel will get the attention
- o Show people realistic solution to force a "pull" for the government to do something
- o Fishing Chain concept appreciated – proximity between government and people
- o Capture Beacons from space using VHS

- o Today's AIS data has some challenges – need for continuous monitoring

Discuss part of IUU Fishing that has not yet been addressed:

- o Possible Group Focus Problem:
  - Leverage NOAA's willingness and involvement to work this test
  - Focus on US where NOAA has authority. (David Pearl clarified that NOAA works internationally – not clear about same authority in other places, though)
  - "Transshipping" in West Africa, Guinea or Macao may be good area to focus on.
  - Target ICAT – tuna – which has US interest and where an MOU exists with EEU. May have benefit / other angles for other partners.
  - Tool "Turnki" (spelling) put data into database; pay small fee to pull data out
  - Used in crowd sourcing (Amazon-type tool)

Follow on meeting:

- o There was interest in keeping the momentum moving forward from this initial meeting. There was discussion around meeting next to select and flesh out a joint problem we could all contribute to solving.

Attendees

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