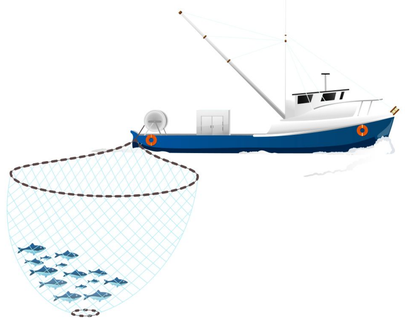


Fishing Ban

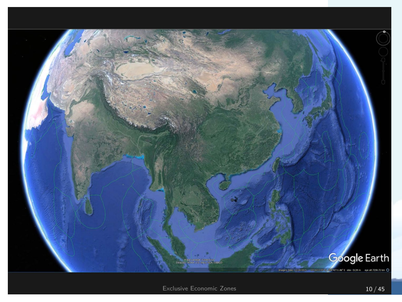
Haishan Yuan

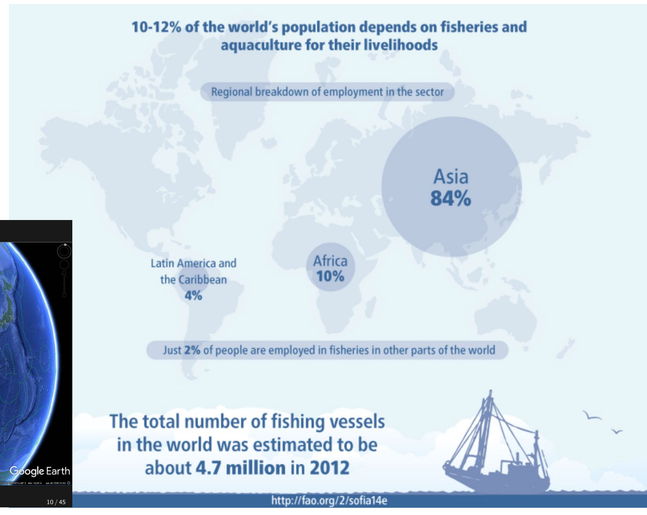
University of Queensland (UQ)

http://haishan-yuan.weebly.com

Challenges in Regulating Fishery:

- Large number of small-scale fishing vessels
- Vast ocean, hard to patrol
- Inter-jurisdictional spillover





In This Paper

- China's Seasonal Fishing Bans:
  - China is by far the largest country in fisheries
  - Implemented the first large-scale seasonal fishing ban
- Questions:
  - Does the fishing ban work?
  - Scope for international policy coordination?
- Empirical Challenges:
  - Measurement
  - Causal Identification

How?

- Remote Sensing Imageries
  - Boat detections at night
  - Near global coverage
  - High frequency: nightly
- Empirical Approaches:
  - RD in Time
  - Spatial RD in Density

Suomi National Polar-Orbiting Partnership Satellite

- New generation weather satellite launched on October 28, 2011
- Polar-Orbiting
- Better sensors: VIIRS

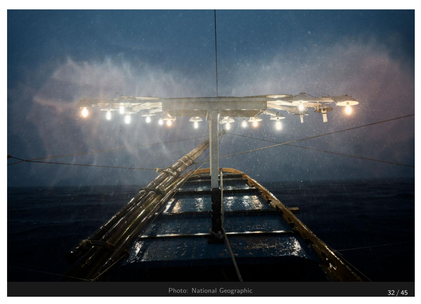
National Oceanic and Atmospheric Administration
U.S. Department of Commerce

VIIRS Day/Night Band

- 742m footprint: 45 times smaller than DMSP-OLS
- Lower detection limits: dimmer lighting detectable
- Multispectral, dynamic range, in-flight calibration, better quantization, etc.

Data:

- VIIR Nighttime Imageries +
- Automatic Boat Identification System →

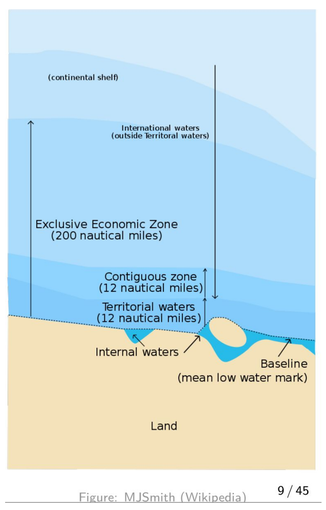


Sample Period:

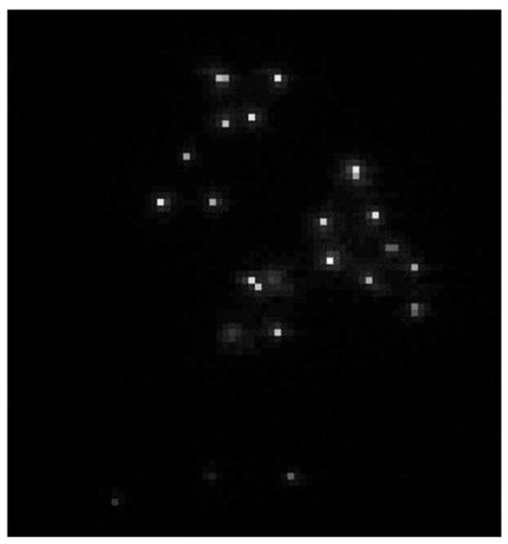
- April 2012 to May 2018

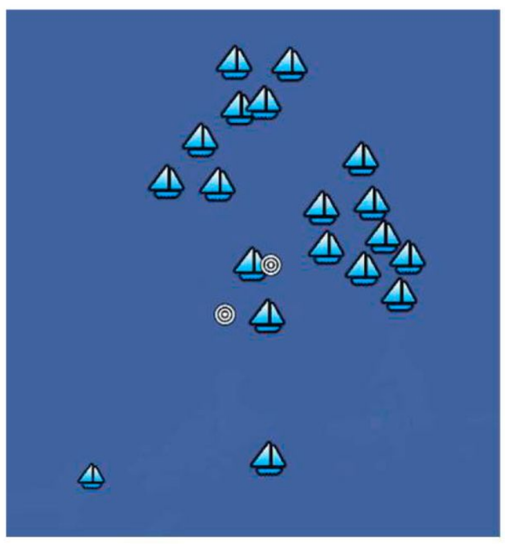
Spatial Focus:

- Chinese EEZ (excluding disputed areas)
- Nearby EEZs

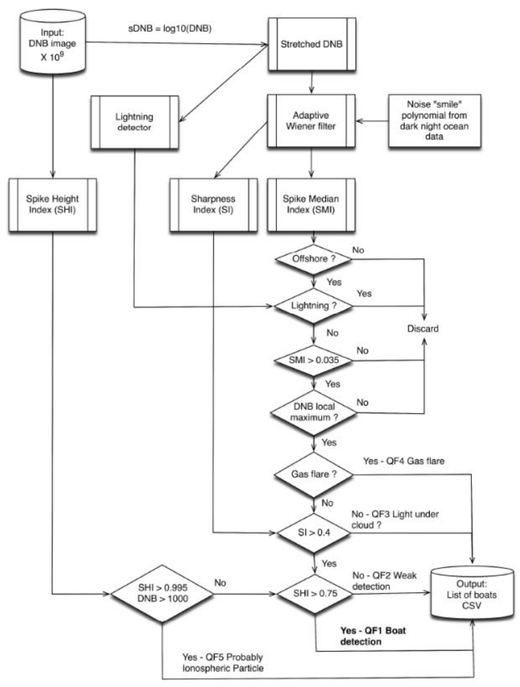


Exclusive Economic Zone (EEZ)

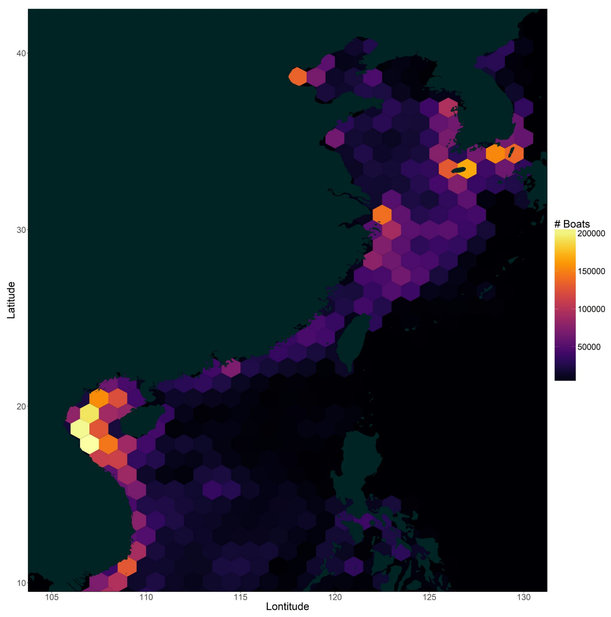




Elvidge et al., (2015) at *Remote Sensing*



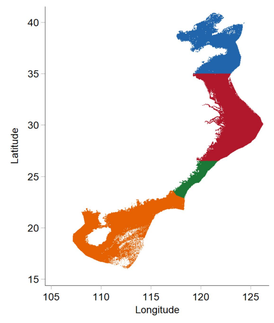
Density of Detected Boats at Night



RD in Time

Running variable:

- # days related to the dates when fishing bans were activated / deactivated



#	Zone Description	2009 – 2016 Start	2009 – 2016 End	2017 – 2018 Start	2017 – 2018 End
1	Northern Yellow Sea	June 1	Sep. 1	May 1	Sep. 1
2	Southern Yellow Sea & Northen East China Sea	June 1	Sep. 16	May 1	Sep. 16
3	Southern East China Sea	May 16	Aug. 1	May 1	Aug. 16
4	Taiwan Strait & South China Sea	May 16 May 16	Aug. 1 Aug. 1	May 1 May 1	Aug. 16 Aug. 16

RD in Time

Outcome variable:

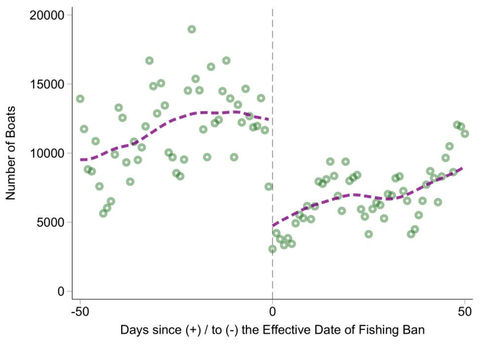
- Aggregate nightly boat detections by regulatory zone of Chinese EEZ
- Calculate the running variable
- Average total number of detections across years
- Aggregate across the four regulatory zones

Local Linear Estimates

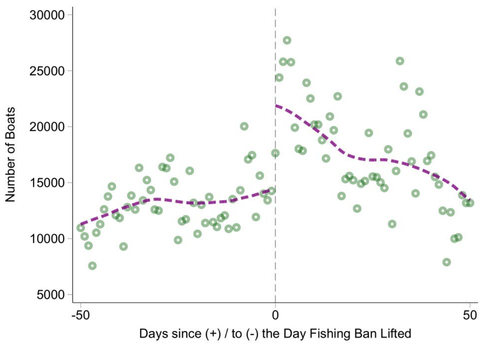
	Fishing Ban On		Fishing Ban Off	
	# Boats	log(# Boats)	# Boats	log(# Boats)
RD Estimate	-8228.098*** (1055.609)	-1.290*** (0.135)	10014.657*** (2462.001)	0.576*** (0.146)
# Observations	151	151	151	151

Notes: $*\ p < 0.10$; $**\ p < 0.05$; $***\ p < 0.01$

Fishing Ban On

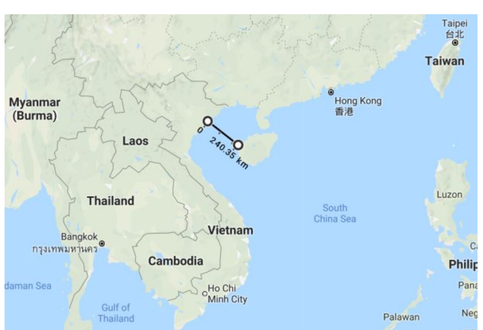


Fishing Ban Off

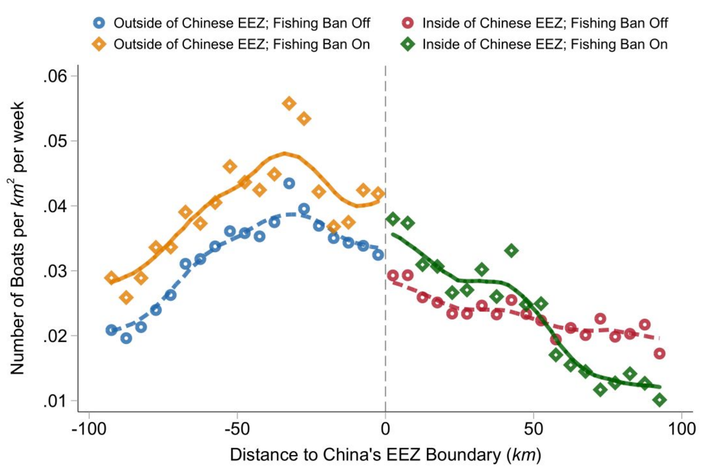


EEZ Incursion?

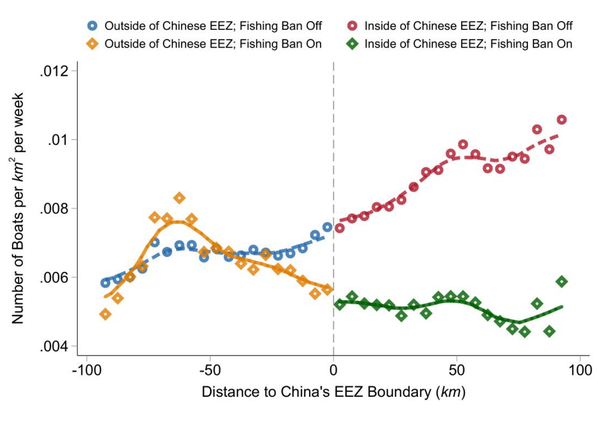
- Boats in Chinese EEZs not necessarily Chinese boats
- Lack of spatial discontinuity of Boat Density around the China-Vietnam EEZ Boundary →



Boat Density around the China-Vietnam EEZ Boundary



Boat Density around the Chinese EEZ Outward Boundary Excluding the China-Vietnam Segment



← The opposite pattern is observed elsewhere, where the Chinese side of EEZ is instead more intensively fished during ban-off periods.

Conclusion

- Fishing bans by-and-large effective in reducing boats fishing in Chinese EEZ
- EEZ incursions likely take place by the fishermen from the more intensively fished sides of EEZs.