

Blue Water Crime and Conservation

Controlling the Pirates in Marine Fisheries



Jon G. Sutinen

**Department of Environmental & Natural Resource
Economics**

University of Rhode Island

WANTED

INFORMATION

LEADING TO THE CONVICTION OF TOOTHFISH PIRATES



US\$100,000

REWARD

COLTO (The Coalition of Legal Toothfish Operators) offers a reward of \$US100,000 to any person who gives information leading to the conviction on significant illegal fishing charges of fishermen, companies, directors or employees arising out of their illegal fishing activities in the Patagonian toothfish fishery.

COLTO is also offering rewards at its discretion of varying amounts up to \$US100,000 for information it considers critical in stopping or significantly reducing unauthorised fishing in the Patagonian toothfish fishery.

These rewards cover illegal and unregulated activities in any aspect of global Patagonian toothfish fisheries and trade.

send your information to wanted@colto.org or visit the COLTO website

www.COLTO.org



COLTO represents international legal toothfish operators.

Support legal and sustainable toothfish fishing

Toothfish is also known as Chilean Sea bass, Mero and merluza/bacalao de profundidad

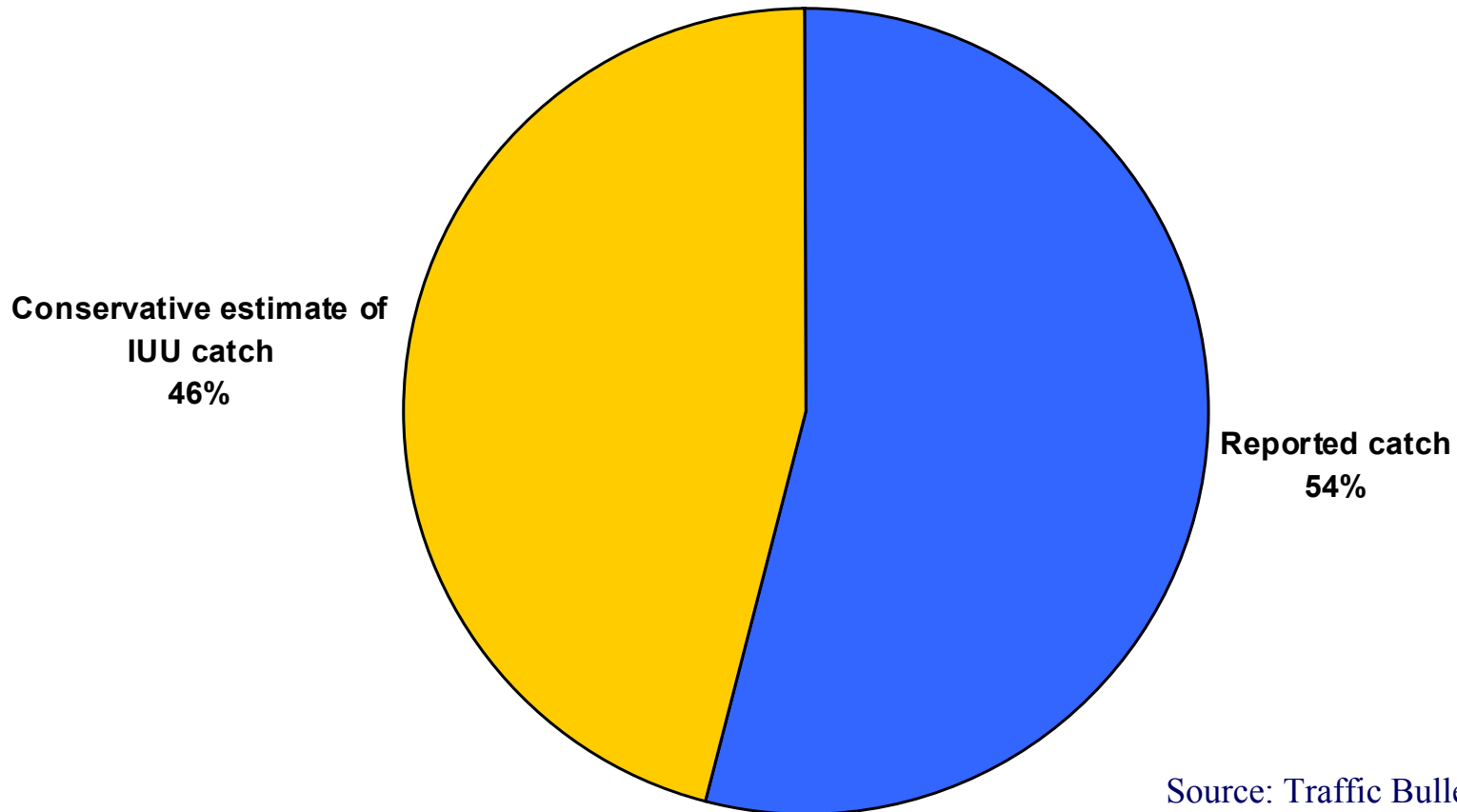
Patagonian Toothfish Pirates

Chase & capture of *FV Viarsa*, August 2003



Trade-based estimate of IUU catches of Patagonian Toothfish, 1999/00

Trade-based estimates of IUU catches of Patagonian Toothfish, 1999/00



Source: Traffic Bulletin (2001)

Caspian Caviar in Peril

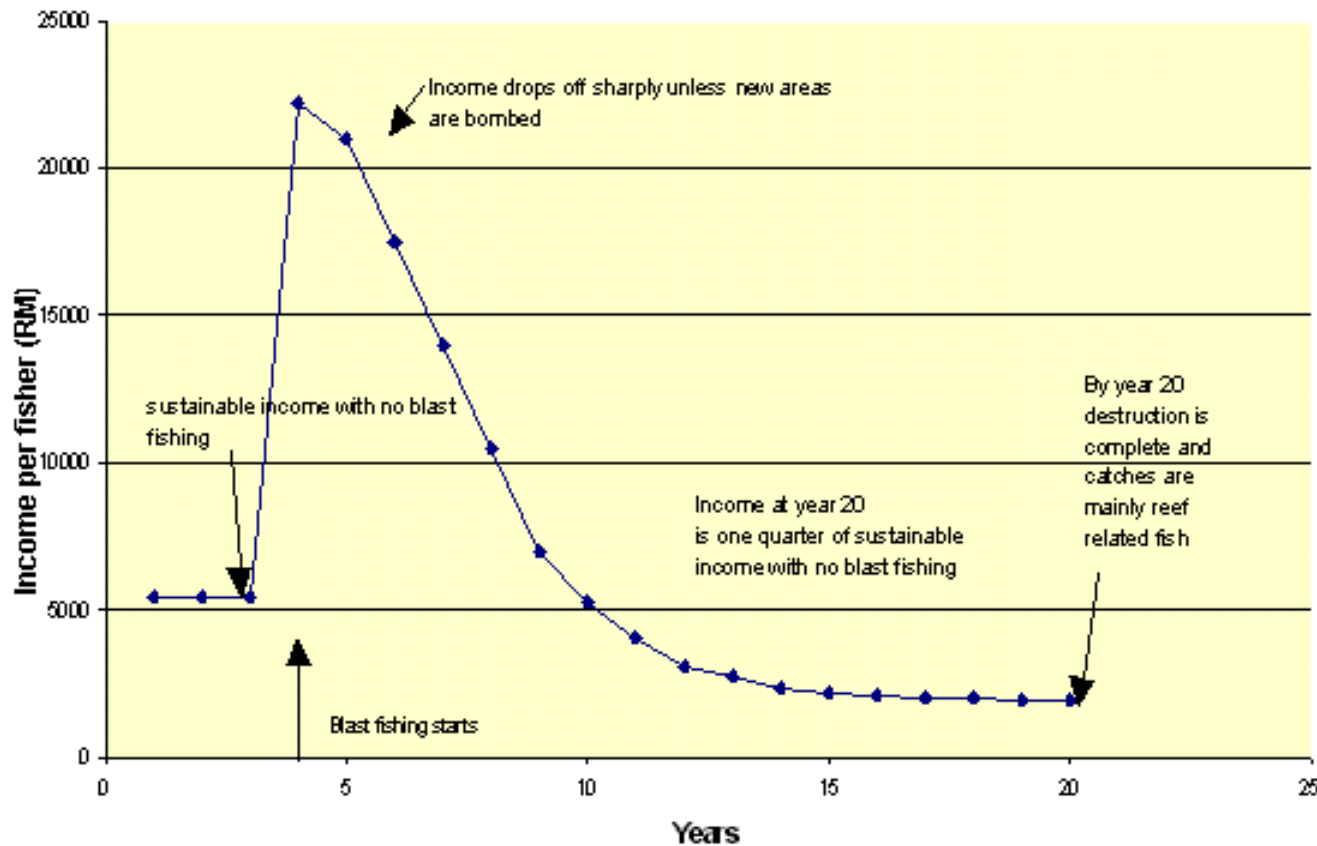


Blast Fishing



Economics of Blast Fishing

Economic models of blast fishing practices show that blast fishing was initially four times more



Small-scale and ultimately medium-scale fishers continue to fish the same reefs year after year and by year 20 after starting blast fishing, the fishers' income is only one-fifth of what would have been available by sustainable methods. Unfortunately, the destroyed reefs will now take as many years to recover!



Source: Tropical Research & Conservation Center, tracc.org.my

Fishing with Cyanide



REWARD

Up to \$1,000 for information leading to the arrest
and conviction of persons illegally taking
Abalone in the state of California.



To report a violation contact:



Caltip
1 (888) DFG-CALTIP
1 (888) 334-2258



Project funded jointly by Sonoma County Abalone Network, Sonoma County
Fish & Wildlife Abalone Restitution Fund, and Calif. Dept. of Fish & Game



Abalone poachers pinned



**By AMY KATZ
Of The Beacon**

On Thursday, May 20, marine Fish and Game wardens tracked and arrested two abalone poachers just south of Elk off Highway 1. The poachers, commercial urchin divers from San Diego, had 468 abalone on board.

According to Warden Gary Combes of Fort Bragg, Fish and Game had information that the divers, Kurt A. Ward, 43, and Joshua Holt, 34, were in the area last month to dive for urchin. They never made a landing, however, which raised suspicion among the wardens, who decided to watch for the pair's return.

Combes said Ward and Holt dove last Tuesday, perhaps to keep up appearances, but on Thursday at around noon he got a call from his colleague, Ed Ramos, who said the men's boat, Blind Strike, was anchored off

Elk. While Combes watched, the two divers proceeded with what appeared to be a typical urchin dive. Combes had to leave the area, so he alerted the warden in charge of the case, Dennis McKiver, to look for them when they arrived in Albion harbor where they were working out of.

"It was a squad effort," Combes said in a telephone interview this week. "One person advised me, I notified another and he met the divers at the harbor." The poachers arrived at Albion harbor at around 3 p.m.

After discovering the abalone, McKiver contacted Combes and wardens from the Department of Fish and Game Special Operations Unit. McKiver and Combes escorted the poachers with their boat to Noyo Harbor, arriving about 5:30 p.m., where they were met by warden Lt. Kathy Ponting, and warden Barry Ceecon and

Top: Lead investigating Warden Dennis McKiver stands aboard the Blind Strike prior to investigation. Above, Warden Gary Combes and the 468 poached abalone. Left, the hold filled with gear, hiding the abalone beneath. Photos provided.

officer Gerry Gmeiner of the California Highway Patrol. The officers inventoried the boat and

conducted interviews. Combes said Ward and Holt did **See ABALONE on Page 15A**

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Jack London



TALES OF THE FISH PATROL



The Pirates of Belford



Illegal, Unreported, Unregulated Fishing

- **May range from 5 - 19% of the global landed catch**
 - equivalent to \$2.4 - 9.5 billion of first-sale value
- **IUU fishing occurs in nearly all fisheries of the world's oceans**
 - all regulated species are taken by IUU fishing to varying degrees
- **Principal high-value species taken by IUU fishing include**
 - tuna, sharks, shrimp, toothfish, cod, sturgeon, abalone, and beche-de-mer

Importance of Enforcement

- **Essential for effective fishery management**
- **Enforcement is expensive**
 - **U.S. Federal expenditures on fisheries management**
 - **\$0.9 billion**
 - **nearly half on fisheries enforcement**
 - **\$400⁺ million**
 - **roughly 25% of landed value from federal waters**

Context:

US Fishery Regulations

- **Types of regulations**
 - catch (output) quotas
 - effort (input) quotas
 - gear & vessel restrictions
 - mesh size, HP, length
 - fish size & sex limits
 - time & area closures

- **Purpose of regulations**
 - protect fishery resources from over-exploitation
 - reduce user conflicts
- **Implementing agencies**
 - National Marine Fisheries Service
 - US Coast Guard
 - US F&W Service
 - State F&G agencies

The Challenges

- **Vast ocean area & hundreds of fishing ports**
- **Thousands of commercial fishing vessels**
- **Millions of sports anglers**
- **Mobile fishing operations**
- **Enforcement very costly**
 - **40% of all US government expenditures on fisheries (~ \$400 million)**
 - **most expenditures on at-sea enforcement**

Enforcement Modes

- **Dock side**
 - inspections of landings, gear & vessels
- **At sea**
 - sea patrols & boardings
 - air patrols
- **Undercover operations**
- **Paper trail audits**

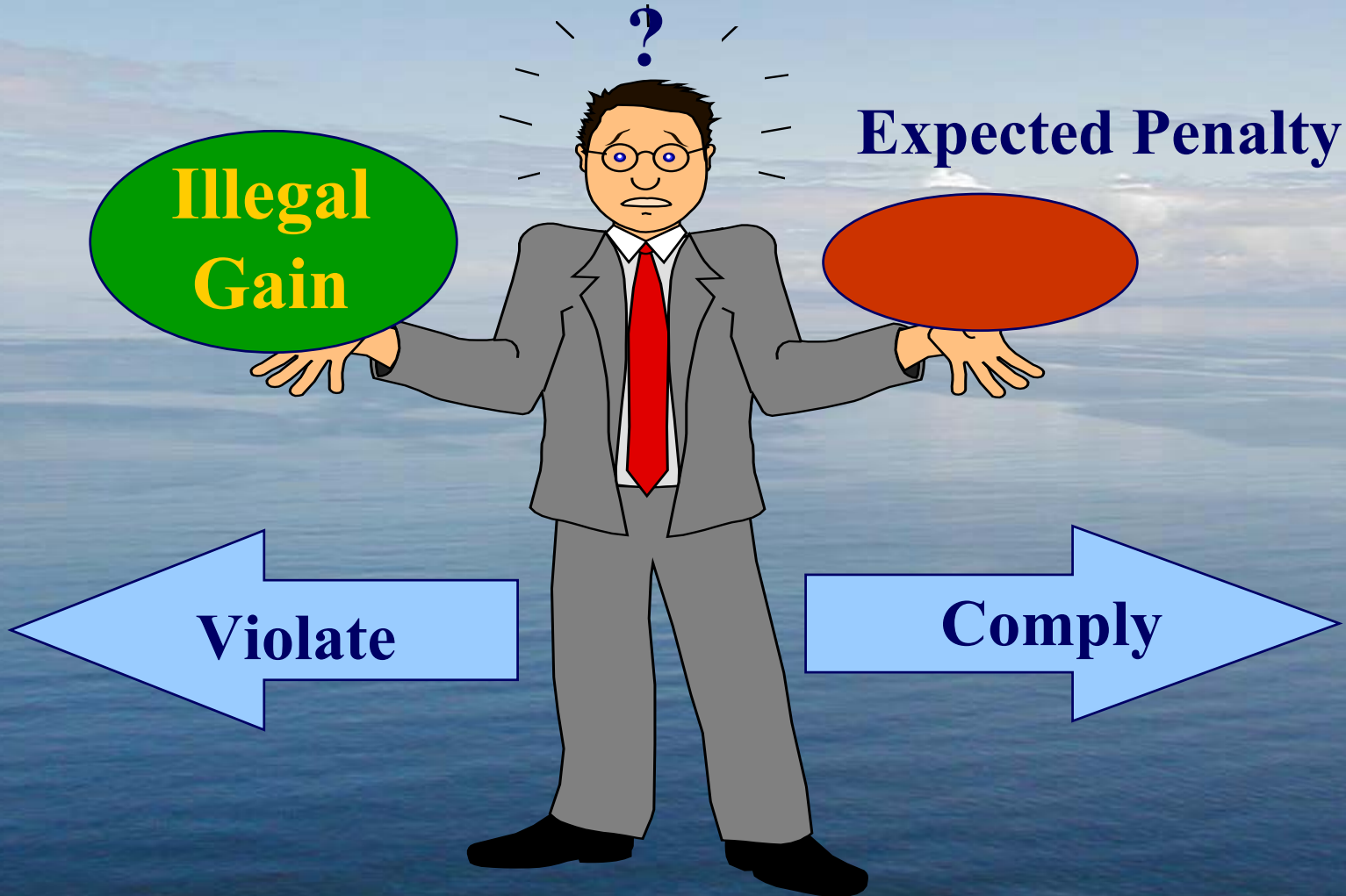
Post-EEZ History in U.S.

- **Magnuson Act of 1976**
- **First NE Groundfish FMP, 1977-82**
 - TACs on cod, haddock & yellowtail flounder
 - minimum mesh & fish sizes, closures
 - individual vessel trip limits, log books
- **Problems**
 - ‘wholesale violations and inadequate enforcement resources to enforce the management rules’
 - Wang & Rosenberg

Early Research

- **Official analyses of management policy**
 - assumed compliance perfect
 - enforcement costless
- **Sutinen & Andersen (1985) developed the theory of fisheries enforcement**
 - pure deterrence
 - predicts compliance when crime does not pay
 - prescription for enforcement policy:
 - expected penalty $>$ illegal gains

Deterrence Theory of Compliance



Early Research

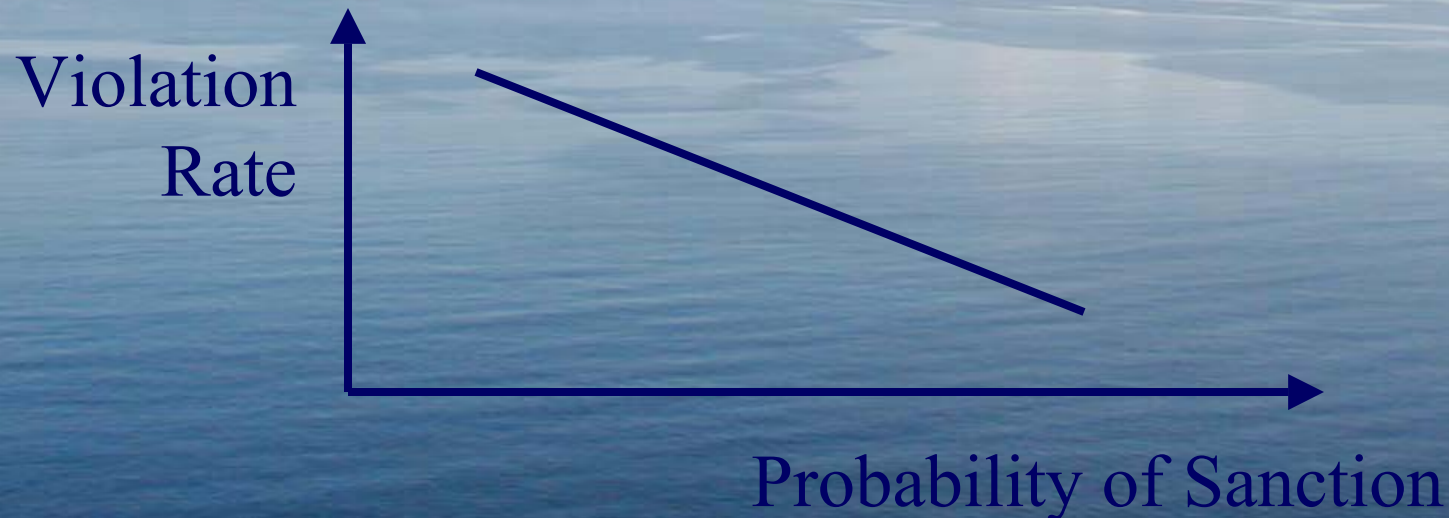
- **1985 URI fisheries enforcement workshop**
 - fish harvester
 - fishery managers
 - enforcement agents
 - government attorneys
 - administrative law court judge
 - researchers
- **Proceedings: Sutinen & Hennessey (1987)**

1985 Enforcement Workshop

- **Canadians' research**
 - **Edwin Blewitt, Peter Toews, William Furlong**
 - **survey of commercial fishermen**
 - **estimated**
 - **illegal gains**
 - **expected penalties**
 - **perceived penalties**
 - **perceived probabilities of detection & sanction**

1985 Enforcement Workshop

- Canadians' research (cont'd)
 - tested deterrence model (Furlong, 1991)



1985 Enforcement Workshop

- **Aftermath**
 - **basic deterrence model embraced**
 - **attorneys calculated fines needed to deter violations**
 - **penalty schedules revised**
 - **agency heads found justification for enforcement resources**
 - **researchers applied deterrence model to fishery law enforcement**

Studies of Fisheries Enforcement & Compliance

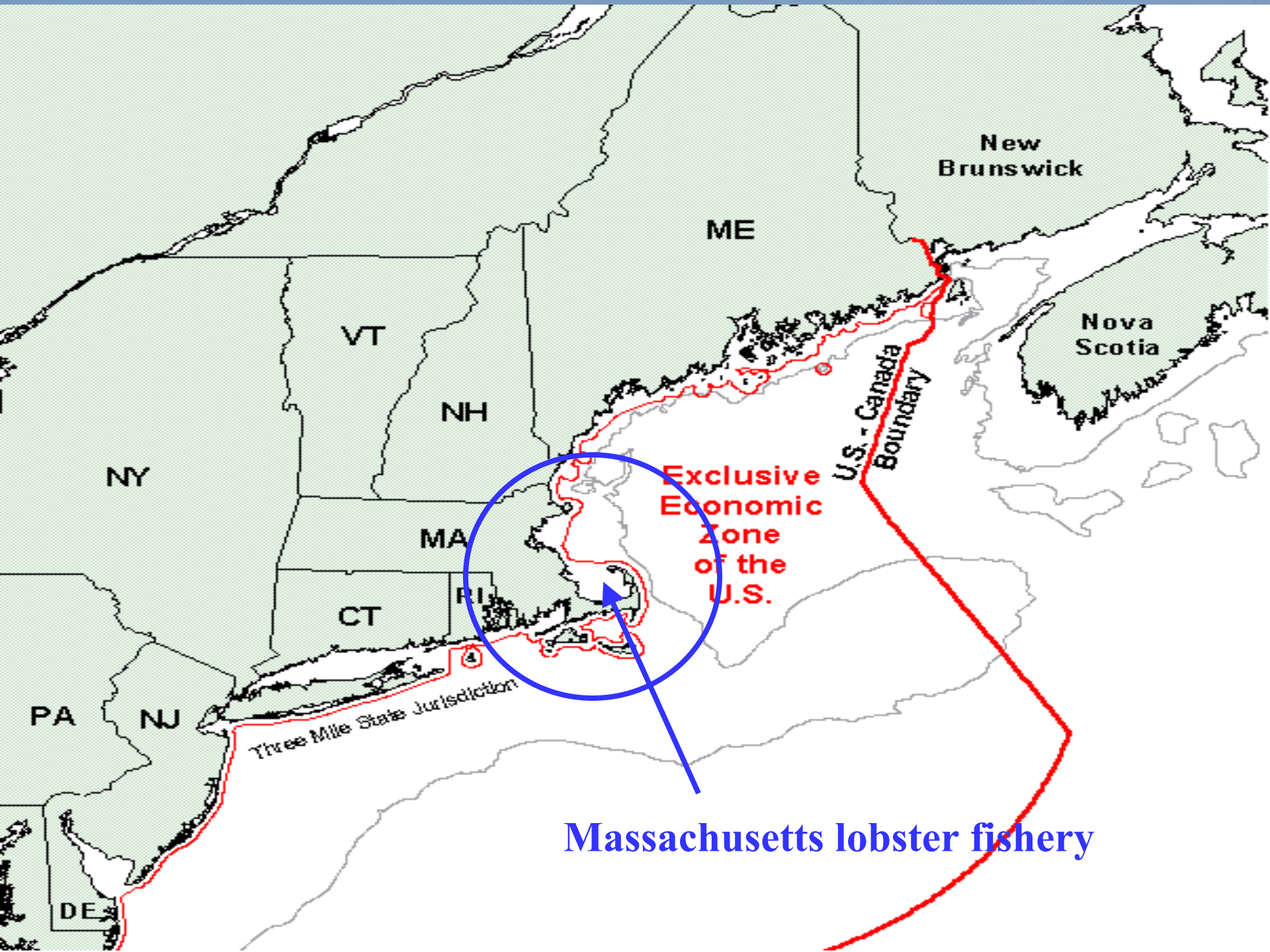
- **Late 1980s & early 1990s**
 - **Massachusetts lobster fishery**
 - **Rhode Island clam fishery**
 - **New England Groundfish fishery**
 - **U.S. Atlantic Scallop fishery**
 - **Gulf of St. Lawrence fisheries**

Massachusetts Lobster Fishery

- **Spring, 1987, survey**
 - survey of Massachusetts inshore commercial lobster fishery, using Canadians' methods
 - mail questionnaire, 'proxy subject'
- **Regulations prohibit**
 - keeping undersized lobster
 - keeping egg-bearing females
 - stealing lobster from others' pots

Massachusetts Lobster Fishery

- **Methods**
 - mail survey
 - ‘proxy subject’
 - response rate
 - verifying data
- **Challenges**
 - data collection
 - statistical analysis



Massachusetts lobster fishery

Massachusetts Lobster Fishery

- **Results**
 - **12% of lobstermen frequently violate**
 - undersized, egg-bearing, theft from gear
 - **illegal gains = \$1.96 mil., 6% of landings**
 - ~ 3% illegal fishing mortality
 - **small chance of detection & sanction**
 - for a single violation = 1/10,000
 - at least once per year = 1/100 for frequent violators

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Massachusetts Lobster Fishery

- **Results (cont'd)**

- **confirmed deterrence hypothesis**
- **lobstermen praised enforcement program for**
 - **dedication, fairness & neutrality**

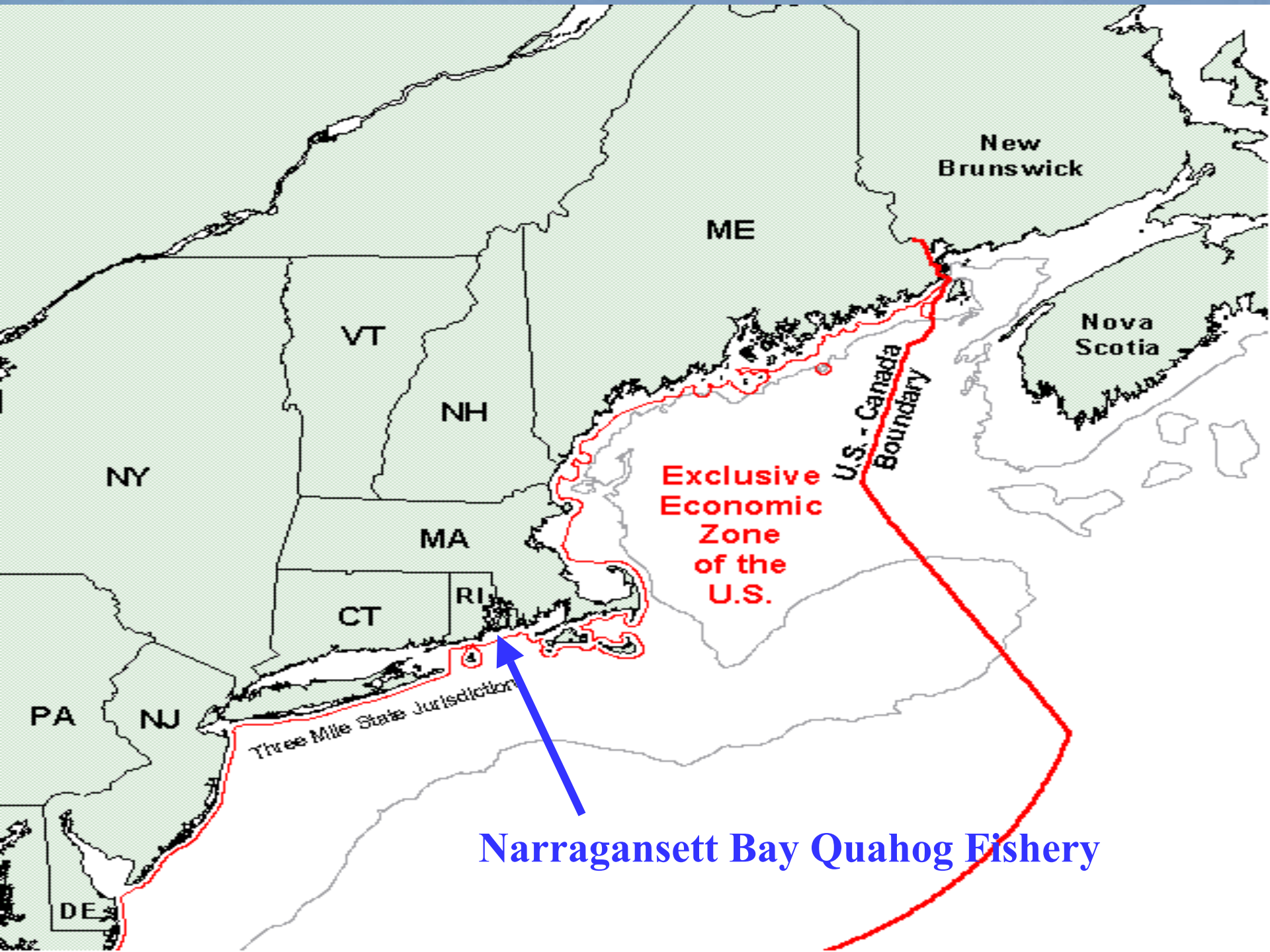
- **they criticized program for poor**
 - **response rates & time**
 - **effectiveness of methods & use of equipment**
- **& engaged in high rates of 'self-enforcement'**
 - **claim half or more of all enforcement is carried out by lobstermen alone**

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Regulatory Enforcement and the Quahog Fishery, circa 1988

- **Regulations prohibit**
 - **taking clams from polluted waters**
 - **taking undersized clams**
 - **exceeding daily limit**
 - **fishing in closed areas**



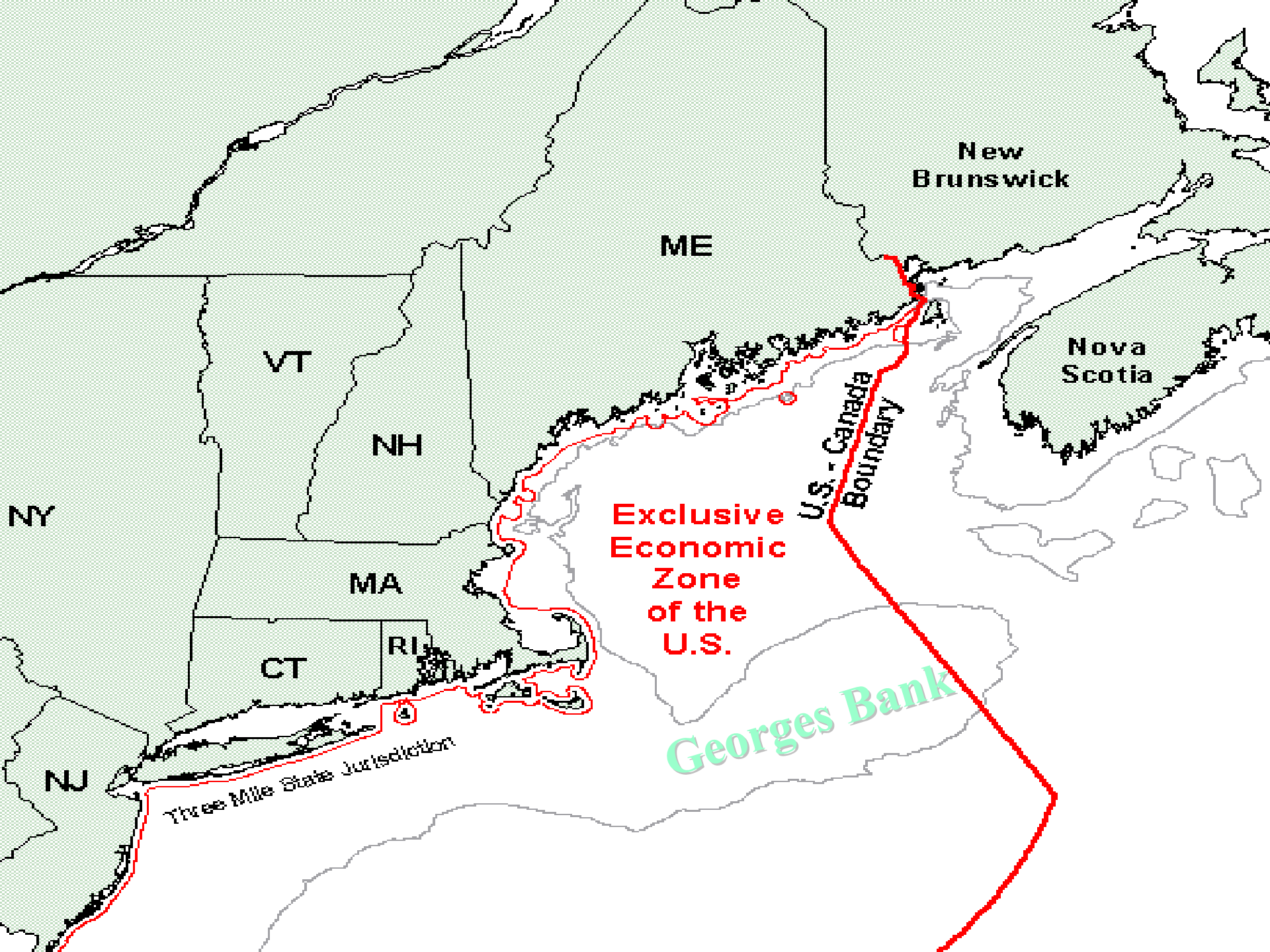
Narragansett Bay Quahog Fishery

RI Quahog Fishery, 1988

- **Findings of survey**
 - **10% frequently violate regulations**
 - **undersized, closed areas, polluted waters, daily limit**
 - **common sanctions**
 - **fining ranging from \$100 to \$500**
 - **forfeiture of catch, gear & boat**
 - **illegal gains =**
 - **per day**
 - **\$150 from closed management area**
 - **\$200 from polluted waters**
 - **one-third to one-half average fisher's income**
 - **\$657,000 or 5% of landings**

Quahog Enforcement & Compliance

- **chance of detection & sanction**
 - less than 1% for a single violation
 - at least once a year = 1/3 for frequent violator
 - 30 times greater than in Massachusetts lobster
- **predicted actual number of prosecutions**
(80 vs. 94)
- **confirmed deterrence hypothesis**



New Brunswick

ME

VT

NH

Nova Scotia

U.S. - Canada Boundary

Exclusive Economic Zone of the U.S.

Georges Bank

MA

CT

RI

Three Mile State Jurisdiction

NY

NJ

New England Groundfish

- **Mail questionnaire, Summer of 1988**
- **Management regulations violated**
 - area closures, minimum mesh size
- **Results**
 - illegal fishing = \$11-25 mil., 6-14% of landings, most from Georges Bank
 - frequent violators = 1/4 to 1/2 of fleet on GB
 - illegal gains = \$225,000 per violator per year, 11-25% of total reported landings on GB

Atlantic Scallop

- **Management regulations violated**

- meat count

- **Results**

– Areas:	Mid-Atl.	Geo. Bank
– illegal fishing	\$ 4 mil	\$ 3.4 mil
• % of landings	6%	7.5%
– frequent violators	1/2 - 3/4	1/4 - 1/2
– illegal gains/FV	\$ 75,000	\$105,000

What did we learn from these studies?

- **Potential illegal gains are large**
- **Chance of being caught & sanctioned is small**
 - less than 1% for any one violation (Sutinen, et al.)
- **Expected penalty is less than illegal gains**
 - **Expected fine = \$200 - \$400**
vs. \$15,000 illegal gain per trip
 - **Viewed as ‘a cost of doing business’**
- **High proportion of fishermen normally comply**

A Puzzle

- **Why are fishermen complying when illegal gains exceed the expected penalty?**
- **A clue from lobstermen**
 - **said they ‘believe in the regulations,’ that complying is the ‘right thing to do’**
 - **moral obligation**
 - **they engage in a high degree of ‘self enforcement’**
 - **social pressure**

Search for a Richer Theory of Compliance

- **Psychology**
 - **cognitive theory**
 - **Kohlberg (1969, 1984)**
 - **compliance depends on personal morality & stage of moral development**
 - **social learning theory**
 - **Akers (1985), Aronfreed (1968)**
 - **compliance depends on peer's opinions & social influence**

Search for a Richer Theory of Compliance

- **Sociology**
 - **instrumental**
 - **compliance depends on incentives, i.e., illegal gains vs. severity & certainty of sanction**
 - **normative**
 - **compliance depends on perception of the fairness & appropriateness (i.e., legitimacy) of the law & implementing agencies**
 - **Tyler (1990)**

Search for a Richer Theory of Compliance

- **Economics**

- **Adam Smith, *Theory of Moral Sentiments* (1759)**

- **individuals are motivated by**

- **acting morally (moral obligation)**

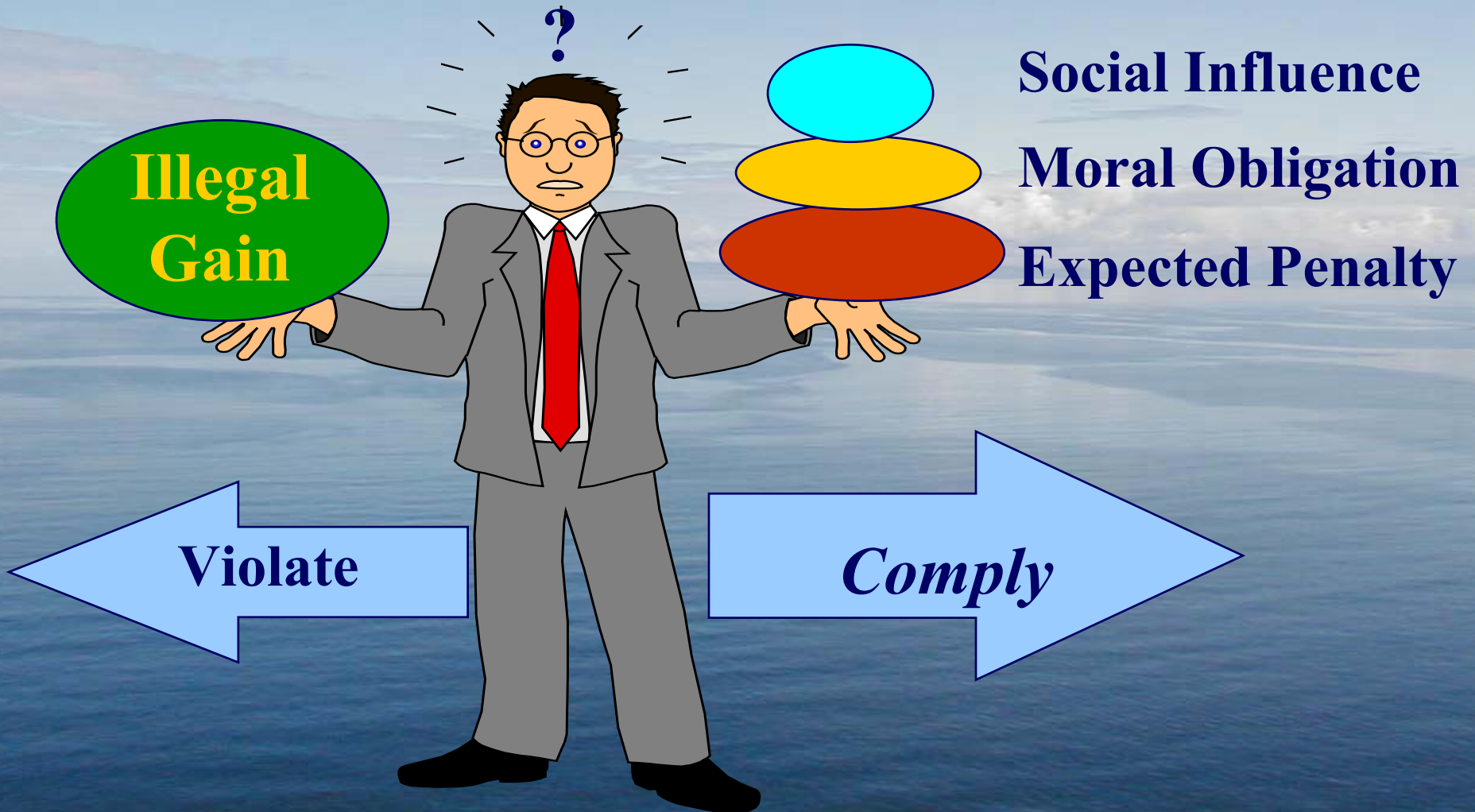
- **receiving the approval of others (social influence)**

- **enhancing wealth (pure self interest)**

- **Allingham & Sandmo (1972)**

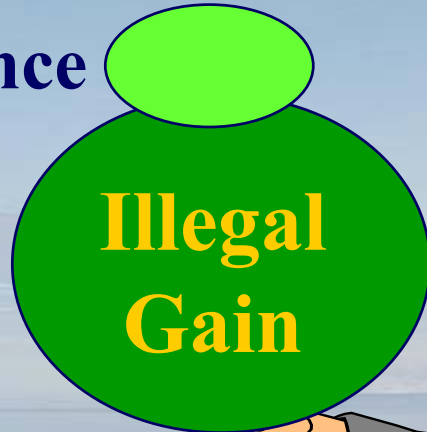
- **compliance depends on social reputation**

The Compliance Decision



Undesirable Compliance Context

Social Influence



**Illegal
Gain**

?

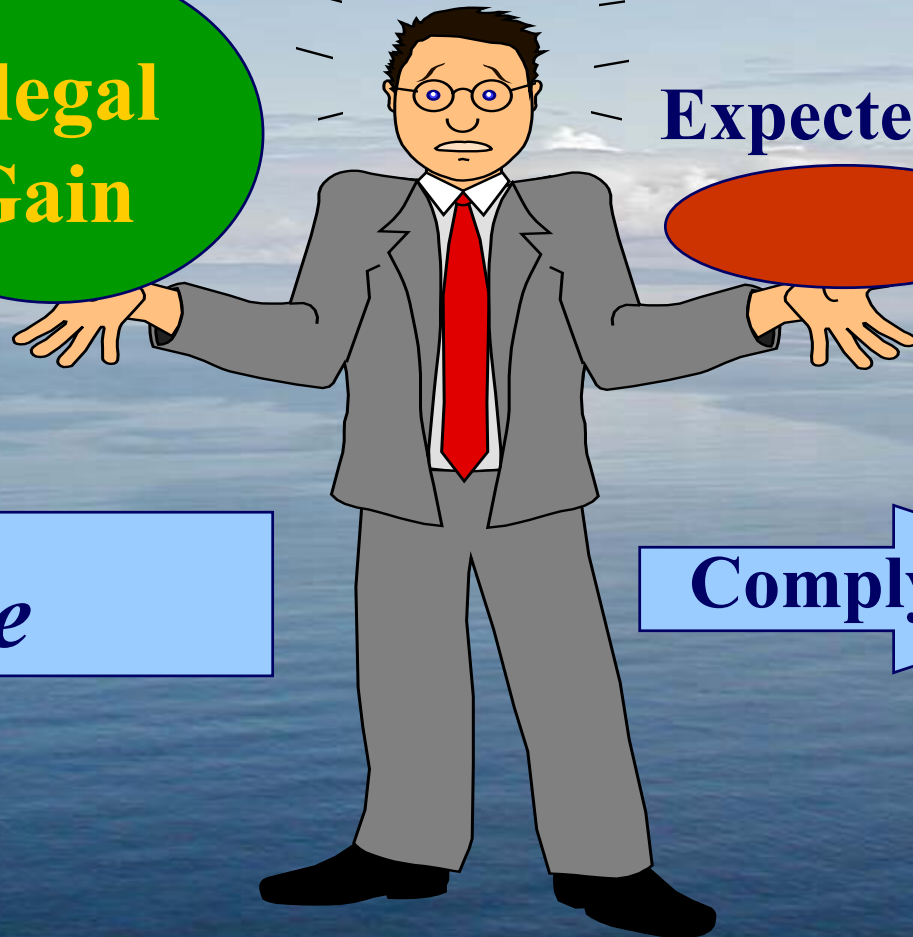
Expected Penalty



Violate



Comply



What we conclude:

- **From tests of enriched model**
 - **fisheries in**
 - **Malaysia, Philippine, Indonesia**
 - **Denmark**
 - **UK**
 - **Tanzania**
- **Tax compliance**
- **Environmental enforcement**
- **Compliance experiments**

What we conclude:

- **Three general types of participants**
 - **Chronic, frequent violators (~ 10-20%)**
 - Violate at virtually every reasonable opportunity
 - **Dedicated compliers (~ 10-20%)**
 - Rarely, if every violate
 - **Conditional compliers (~ 60-80%)**
 - Comply if frequent violators are controlled; otherwise violate

A Test of the Enriched Theory

- **Malaysian trawlers**
 - **banned from fishing within 5 miles of coast**
- **Methods**
 - **personal interview**
 - **standardized questionnaire**
 - **self reports of compliance behavior**
- **318 respondents**
 - **2/3 Malay; 1/3 Chinese**

A Test of the Enriched Theory

- **H_N: compliance depends on**
 - illegal gains (-)**
 - certainty of sanction (+)**
 - moral development (+)**
 - social influence (+)**
 - legitimacy of regulations (+)**

A Test of the Enriched Theory

- **Results**

- **strong support**

- **illegal gains**
 - **moral development**
 - **social influence**
 - **certainty of sanction, for extent of compliance only**

- **mixed, inconsistent support**

- **legitimacy of regulations**

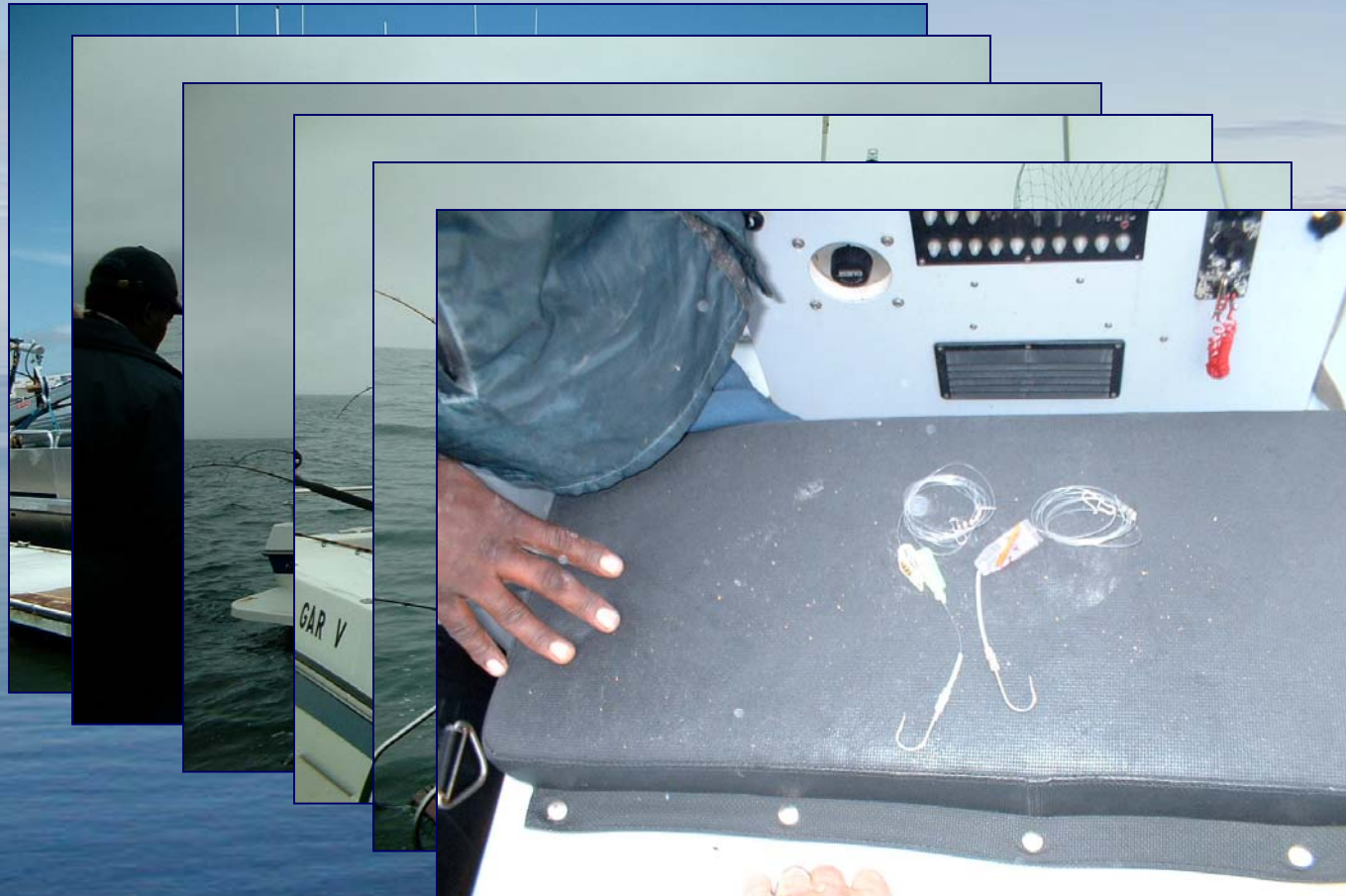
What we conclude:

- **Moral obligation is due to**
 - ‘legitimacy’ of the rules
 - personal beliefs & values, moral development
- **Social influence to comply**
 - can be strong & widely prevalent
- **Most compliance**
 - ‘voluntary’

‘Voluntary Compliance’ is based on:

- **Common understanding of the problem**
 - e.g., over-exploitation.
- **Procedures for developing and implementing measures**
 - must be perceived to be fair.
- **Measures must be perceived to be**
 - effective
 - make a significant contribution to resolving the problem.

California salmon anglers, 2004: *Indications of weak voluntary compliance*

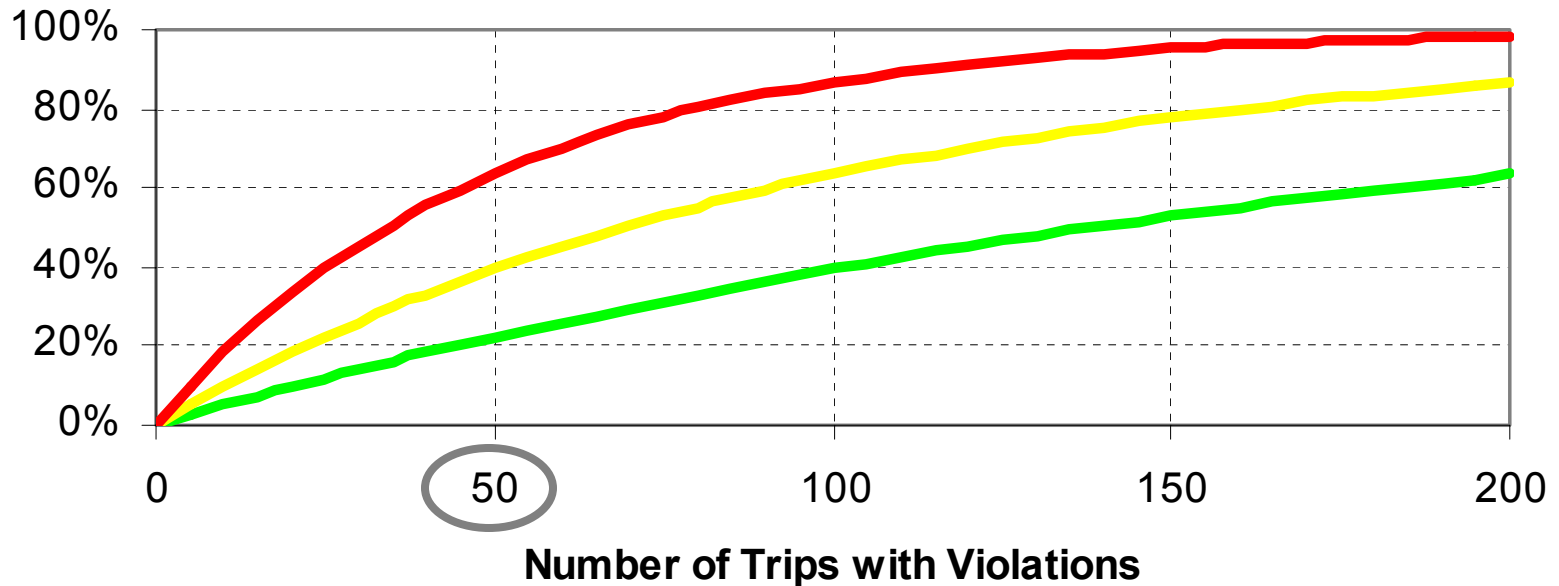


Smart Compliance Policy

- **Target chronic, frequent violators**
 - **Exploit ‘multiplier effect’**
 - **Influence on ‘conditional compliers’**
 - **Exploit laws of probability**
 - **Frequent violators are exposed to greater risk of detection**
 - **Example: 200 fishing trips per year**
 - **Following chart shows the odds of being caught at least once during the year**

Targeting Frequent Violators

**Chance of being caught at least once
@ 1, 2, 4 inspections/200 trips**



Smart Compliance Policy

- **The ‘Heaven, Hell, & Purgatory approach to violators**
 - Stay in ‘Heaven’ if violations $< X$
 - Placed in ‘Purgatory’ if Violations $> X$
 - Intense monitoring & reporting requirements
 - Must earn return to Heaven
 - Otherwise advance to ‘Hell’ – banishment or severe penalty

Smart Compliance Policy

- **Adopt enforceable regulations**
- **Seek optimal levels, mix and provision of compliance services**
- **Improve utilization of enforcement resources**
 - **allocation**
 - **flexibility**

Smart Compliance Policy

- **Account for noncompliance in setting regulations**
 - TACs
 - other regulations & policies
- **Account for cost of compliance in each fishery**
 - especially, foregone compliance in other fisheries
 - fishers' costs of compliance (e.g., VTS)

Smart Compliance Policy

- **Promote voluntary compliance**
 - **Extensive user participation**
 - **Devolution of management**
 - **Community-based management organizations**
 - **Share policy development**
 - **Share policy implementation**
 - **Moral suasion**
 - **Public education, social advertising campaigns**
 - **Outreach and liaison arrangements with fishing community**
 - **Link compliance to other programs**
 - **Government insurance, financial assistance programs**
 - **Membership in good standing in organizations**

Compliance Promotion

- **BC's "Observe, Record, & Report" campaign**
- **South Australia's program**
- **Ethical Angling campaign in US**

Continuing Challenges

- **Little voluntary compliance in some fisheries**
 - weak legitimacy
 - lack of rights-based management
 - economic stress on fishers
- **Unenforceable regulations**
- **Lack of enforcement resources**

Implications of the research

- **Maximize voluntary compliance**
 - Increase user participation
 - Devolution of management decision making
 - Community oriented policing methods
- **Measure nature and extent of non-compliance**
- **Account for non-compliance in setting of management measures**

Implications of the research

- **Measure the extent of noncompliance**
 - surveys
 - monitoring & surveillance data
 - compliance liaison committees
 - external indicators
- **Assess impacts of noncompliance on**
 - fish stocks
 - effectiveness of management regulations
 - economic & social consequences

Measures to Combat IUU Fishing on the High Seas

- **Establish ‘traffic light’ lists of entities that produce, trade in and market key IUU species**
 - **Firms, ports, countries**
 - **Green list**
 - **Compliant entities**
 - **Privileges for white listed entities**
 - **Yellow list**
 - **Entities with modest record of compliance**
 - **Limited privileges**
 - **Red list**
 - **Entities of severely noncompliant entities**
 - **Banned from trade**
 - **Restricted access to fuel, insurance, communications and navigation services, etc.**
- **Invoke the Heaven, Hell, & Purgatory deterrence strategy**



Recommended Reading

- Randall, J.K. 2004. Improving Compliance in US Federal Fisheries: An Enforcement Agency Perspective, *Ocean Development & International Law* 35
- Kuperan, K., and J. G. Sutinen. 1998. Blue Water Crime: Legitimacy, Deterrence and Compliance in Fisheries, *Law and Society Review* 32(2)
- Sutinen, J. G. 1996. *Fisheries Compliance and Management: Assessing Performance*. Australian Fisheries Management Authority, Canberra, ACT
- Roheim, C. A., and J. G. Sutinen. 2005. *Trade and Market-Related Instruments to Reinforce Fisheries Management Measures to Promote Sustainable Fishing Practices*. Report to the International Centre for Trade and Sustainable Development and the OECD High Seas Task Force