



Pattern analysis and Clustering techniques for AIS-based identification of lay-ups

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Overview

- Why to monitor lay-ups
- AIS fundamentals
- Use of AIS for monitoring global supply
- AIS based identification of lay-ups
- Where are we now

2014

2015

2016

Why to monitor lay-ups

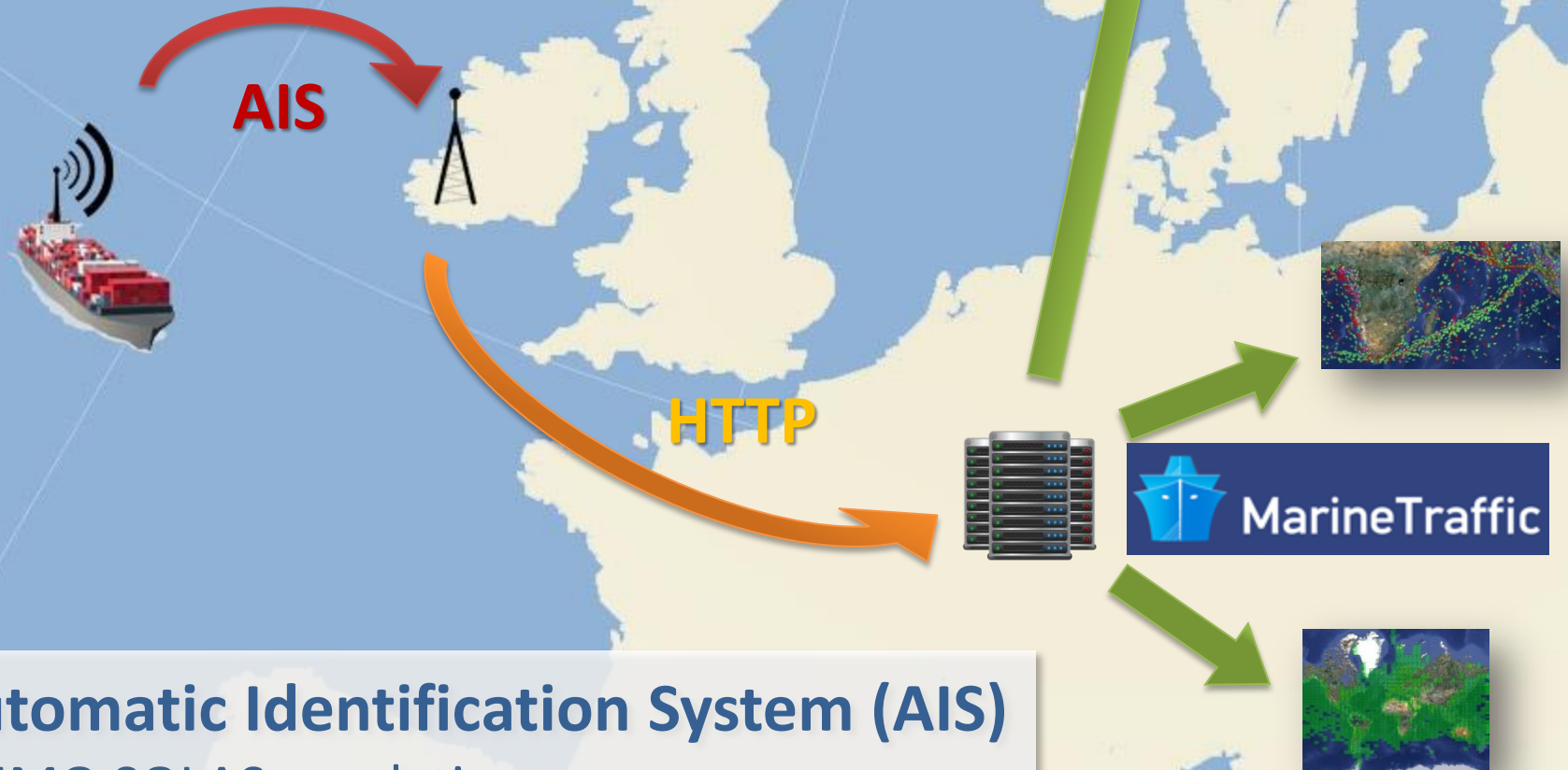
- Supply distortion
- Impact on S&P market
- Trends on lay-up areas

1,500

1,000

500

05/05 642



Automatic Identification System (AIS)

- IMO SOLAS regulation
- Ships over 300 GT
- All passenger ships effective since 31 Dec 2004

AIS Fundamentals

ID

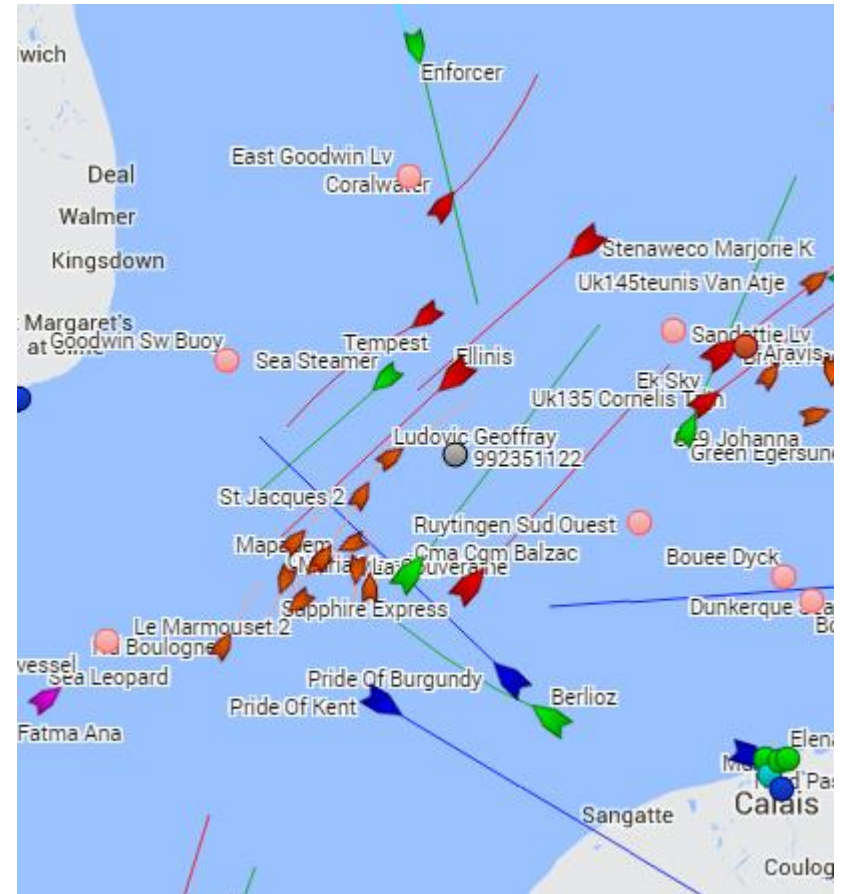
- MMSI/IMO
- Ship Name/Type
- Call sign
- Dimensions

position

- LAT, LON
- Speed
- Heading / Course
- Timestamp

journey

- Draught
- Destination
- Reported ETA




Use of AIS for monitoring supply

- Precise depiction of active Global fleet
- Current and near future capacity per trade area
- Fleet utilization
- Fleet average underway speed
- Port congestion indicators
- Lay-ups

AIS based identification of lay-ups

- pattern analysis
 - Idle time
 - draught
 - location
- clustering analysis
 - concentrations

Where are we now


Dry Cargo Idle / Laid-up Ships

Ship Age: (All)

Time Idle: (All)

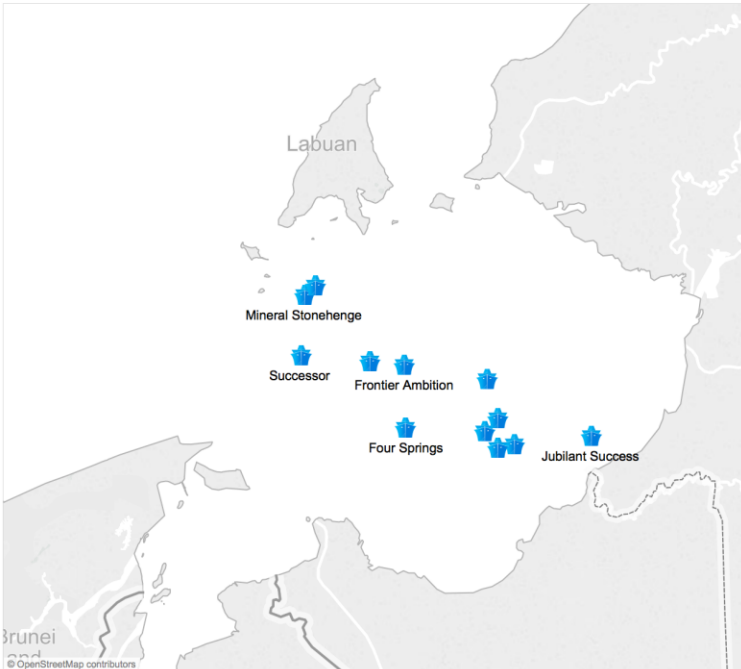
Ship Name: (Multiple values)

DWT: 98000

May 8, 2016

14 Ships

2,3M DWT



Location Area	Ship Name	Build	DWT	Ship Age	Time Idle
China Sea South	Cape Falcon	1992	161475	>20yrs	>6 Months
Davao Bay, Philippines	Imperius	2011	180000	0-5yrs	6 Months
	Olympius	2004	171314	10-15yrs	6 Months
Falmouth, United Kingdom	Frontier Sky	2010	179288	5-10yrs	2 Months
Gibraltar	Sks Tanaro	1999	109786	15-20yrs	>6 Months
Kaohsiung, Taiwan	Five Stars Fujian	2009	181383	5-10yrs	2 Months
Labuan Bay, Malaysia	Star Despoina	1999	170162	15-20yrs	6 Months
	Berge Arctic	2001	174285	10-15yrs	3 Months
	Cape Veni	2007	173764	5-10yrs	3 Months
	Mount Dampier	2011	181469	0-5yrs	3 Months
	Aquabeauty	2003	171014	10-15yrs	3 Months
	Successor	2007	173748	5-10yrs	3 Months
	Aquajoy	2003	171009	10-15yrs	3 Months
	Frontier Wave	2010	174707	5-10yrs	2 Months
	Mineral Stonehenge	2010	175713	5-10yrs	2 Months
	Jubilant Success	2010	110909	5-10yrs	2 Months
Malacca, Malaysia	Four Springs	1992	109009	>20yrs	2 Months
	Frontier Ambition	2004	180253	10-15yrs	2 Months
	Jubilant Excellence	2010	181415	5-10yrs	2 Months
	Frontier Discovery	2010	174845	5-10yrs	1 Month
	Golden Z	2010	175837	5-10yrs	3 Months
	Belgravia	2009	169173	5-10yrs	3 Months
	Blue Lhotse	2011	180132	0-5yrs	3 Months
Port Kelang, Singapore	Golden Feng	2009	169232	5-10yrs	2 Months
	Golden Zhoushan	2011	175834	0-5yrs	2 Months
	Steel Tra Der	1997	154556	15-20yrs	1 Week
Red Sea	Leadership	2001	171199	10-15yrs	2 Months
Riau Archipelago	Falcon Confidence	2004	174234	10-15yrs	3 Months
	Berge Aoraki	1999	172502	15-20yrs	3 Months
	Frontier Harvest	2011	179293	0-5yrs	3 Months
Shanghai, North China	Five Stars Beijing	2010	181417	5-10yrs	6 Months

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