Graduate School of
BUSINESS &
PUBLIC POLICY

# *Financing Humanitarian Assistance and Disaster Response*

## *The Case of the Tōhoku Earthquake and Operation Tomodachi*

***9th Annual Acquisition Research Symposium***
***Acquisition Research: Creating Synergy for Informed Change***
May 16 - 17, 2012

Associate Professor Aruna Apte and Assistant Professor Keenan D. Yoho
Graduate School of Business & Public Policy
Naval Postgraduate School

# *Recent work in the area of HA/DR supported by ARP and focused on operations and finance*

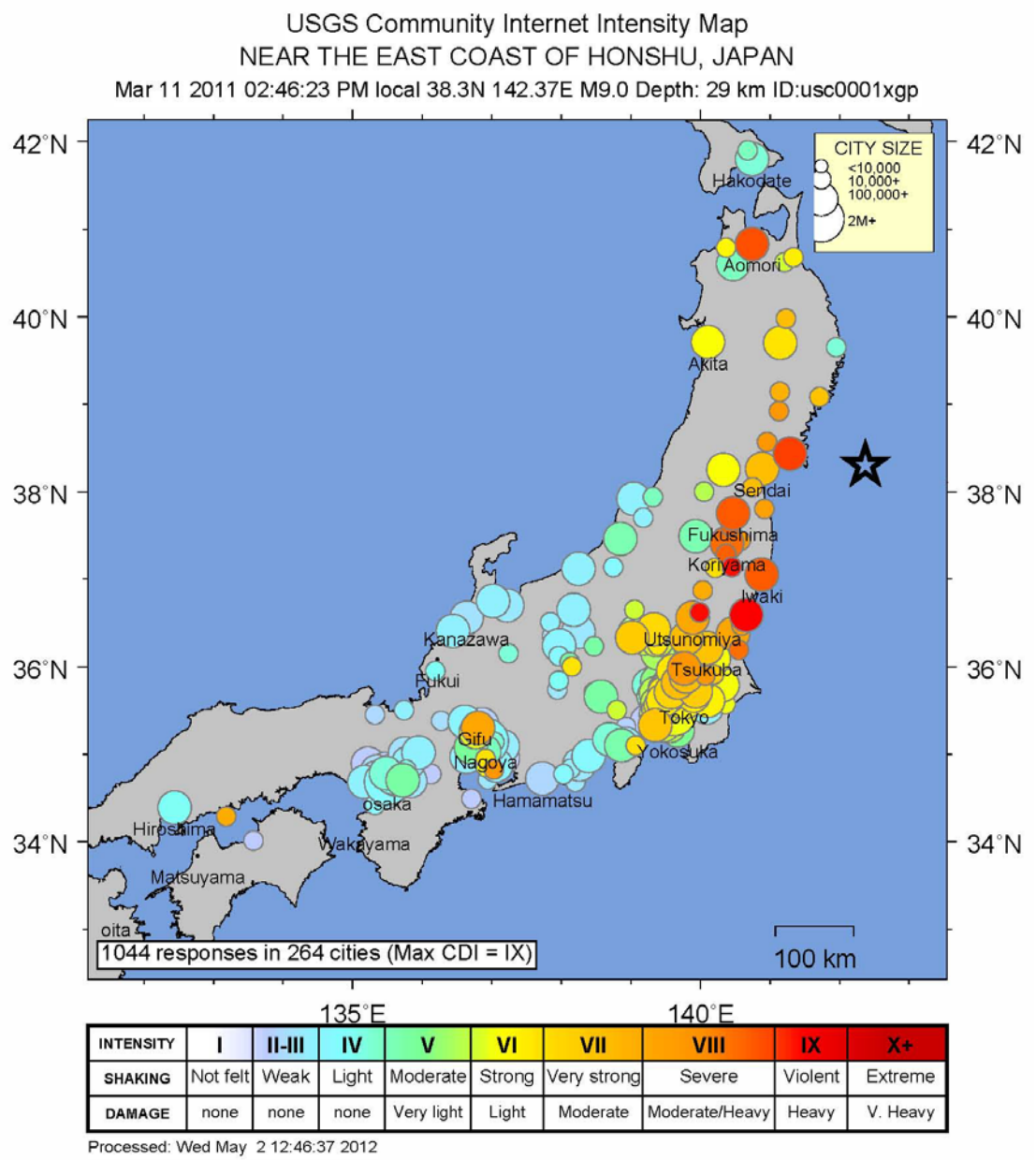
## Operations

- Kaczur, Aurelio, and Joloya (2012), *An Analysis of United States Naval Participation in Operation Tomodachi: Humanitarian and Disaster Relief in the Tsunami-Stricken Japanese Mainland*
- Greenfield and Ingram (2011), *An analysis of U.S. Navy humanitarian assistance* and *disaster relief operations*, Naval Postgraduate Thesis and Acquisition Research Program Report.

## Finance

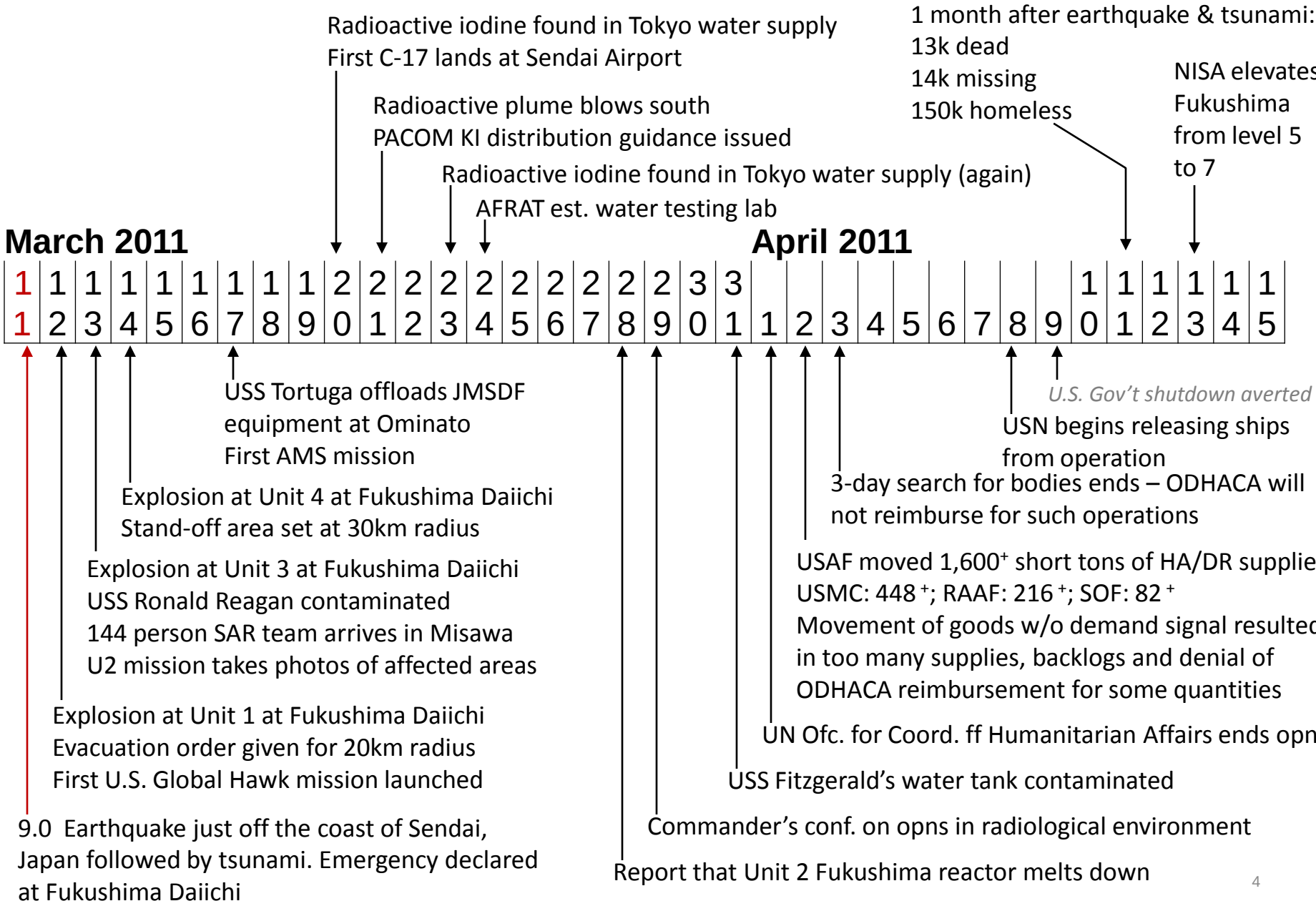
- Herbert, Prosser, and Wharton (2012), *A Cost Analysis of the Department of the Navy Humanitarian Assistance and Disaster Response to the 2011 Tohoku Earthquake and Tsunami,* Naval Postgraduate Thesis and Acquisition Research Program Report.
- Ures (2011), *Financing naval support for humanitarian assistance and disaster response: an analysis of cost drivers and cash flows*, Naval Postgraduate Thesis and Acquisition Research Program Report.

# *Areas impacted by the earthquake*




*Source: U.S. Geological Survey

# The first 35 days of operations*






*Source: Adapted from briefing developed by CDR Fred Dini, SC, USN, JSF Japan Comptroller, May 2011*

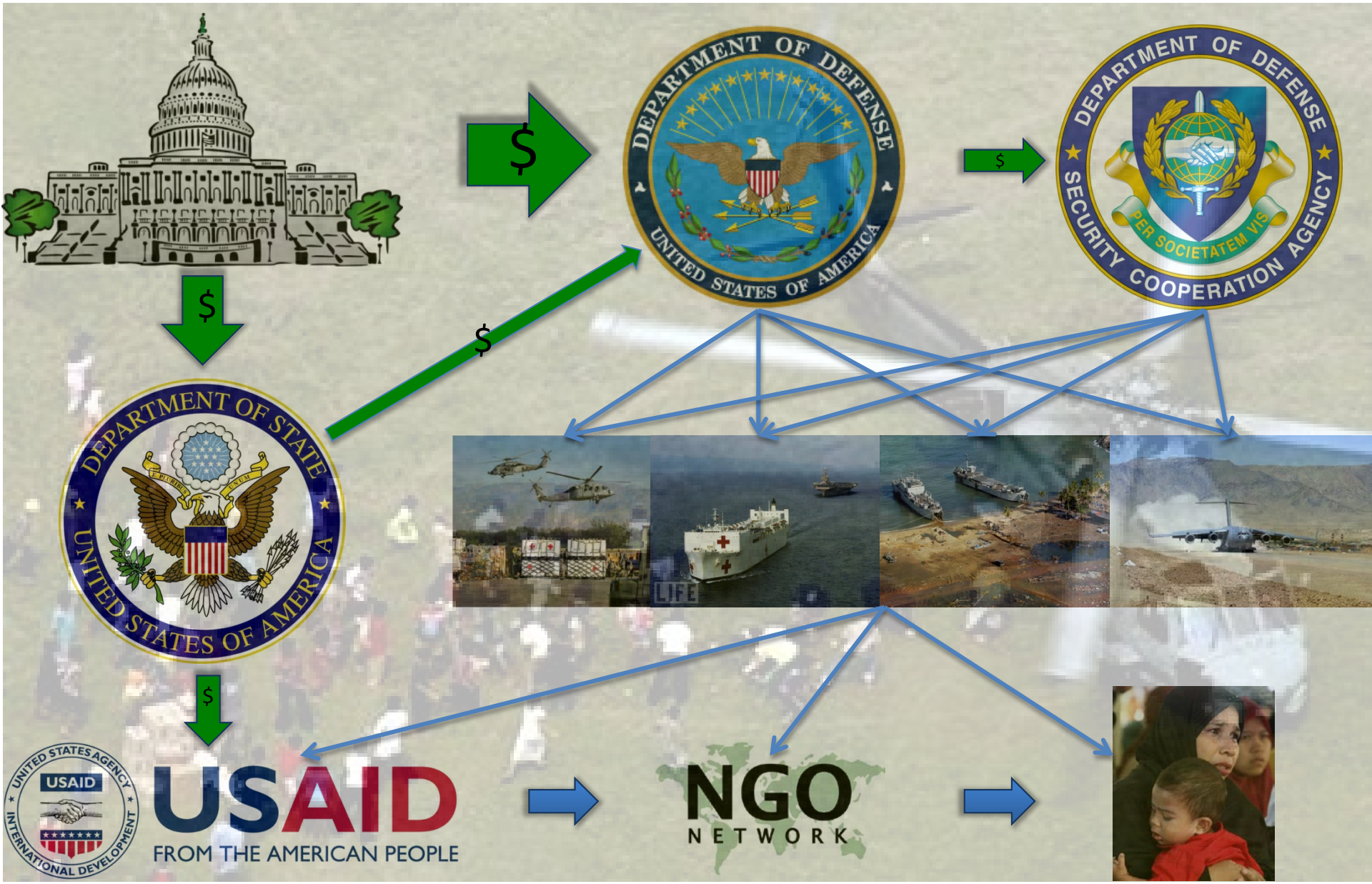
# *U.S. ships deployed for 30 days in support of Operation Tomodachi**

| | | | MARCH | | | | | | | | | | | | | | | | | | | | | | APRIL | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Type** | **Name** | **Platform** | **11** | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 | 26 | 27 | 28 | 29 | 30 | 31 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | **9** | 10 | 11 | 12 | 13 | 14 | 15 |
| USS | CHANCELLORSVILLE | CG | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| USS | COWPENS | CG | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| USS | SHILOH | CG | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| USS | RONALD REAGAN | CVN | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| USS | GEORGE WASHINGTON | CVN | | | | | | | | | | | N | N | N | N | N | N | N | N | N | N | N | N | N | N | N | N | N | N | N | N | | | | | | | |
| USS | PREBLE | DDG | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| USS | MUSTIN | DDG | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| USS | MCCAMBLE | DDG | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| USS | JOHN MCCAIN | DDG | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| USS | CURTIS WILBUR | DDG | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| USS | FITZGERALD | DDG | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| USS | ESSEX | LHD | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| USS | GERMANTOWN | LSD | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| USS | HARPERS PERRY | LSD | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| USNS | TORTUGA | LSD | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| USNS | BLUE RIDGE | LCC | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| USNS | RICHARD E BYRD | T-AKE | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| USNS | CARL BRASHEAR | T-AKE | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| USNS | MATTHEW PERRY | T-AKE | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| USNS | PECOS | T-AO | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| USNS | RAPPAHANNOACK | T-AO | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| USNS | BRIDGE | T-AOE | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| USNS | SAFEGUARD | T-ARS | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| MV | WESTPAC EXPRESS | HSV | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |



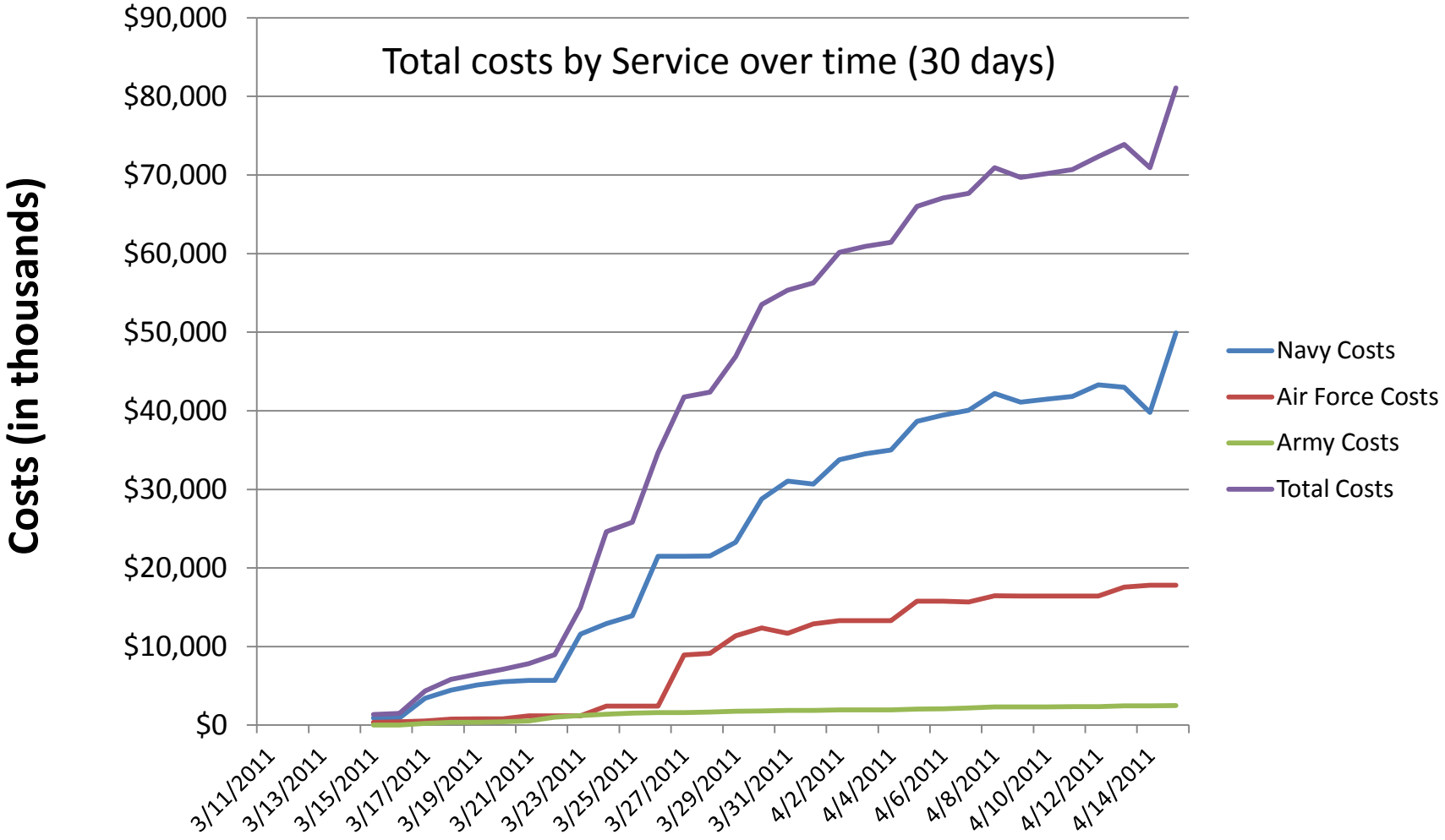
**Source: Kaczur, Aurelio, Joloya, 2012*

# ODHACA funding process



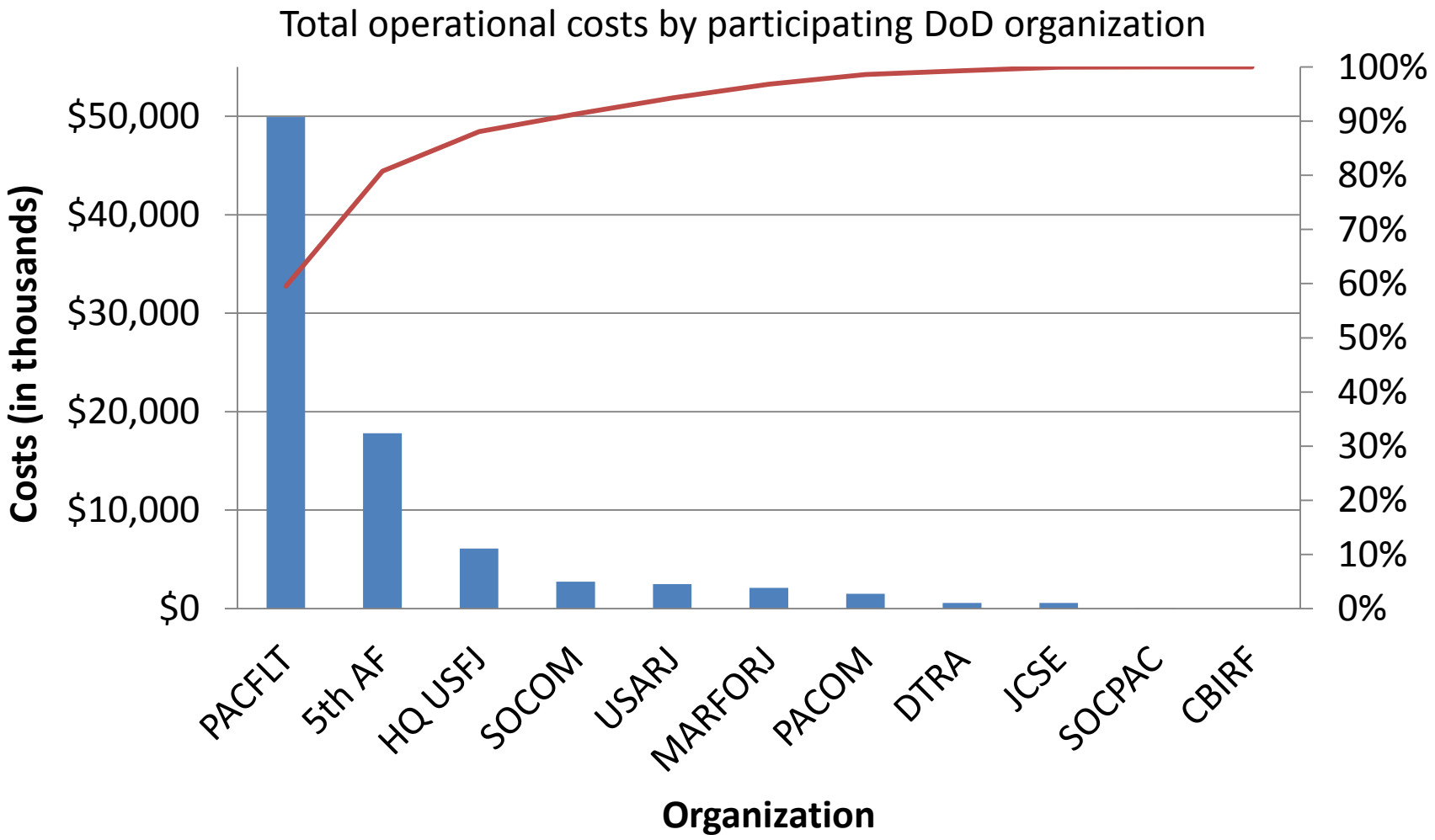

*Source: Ures, 2011

# *The Navy was the key responder for the US DoD and therefore drove most costs*



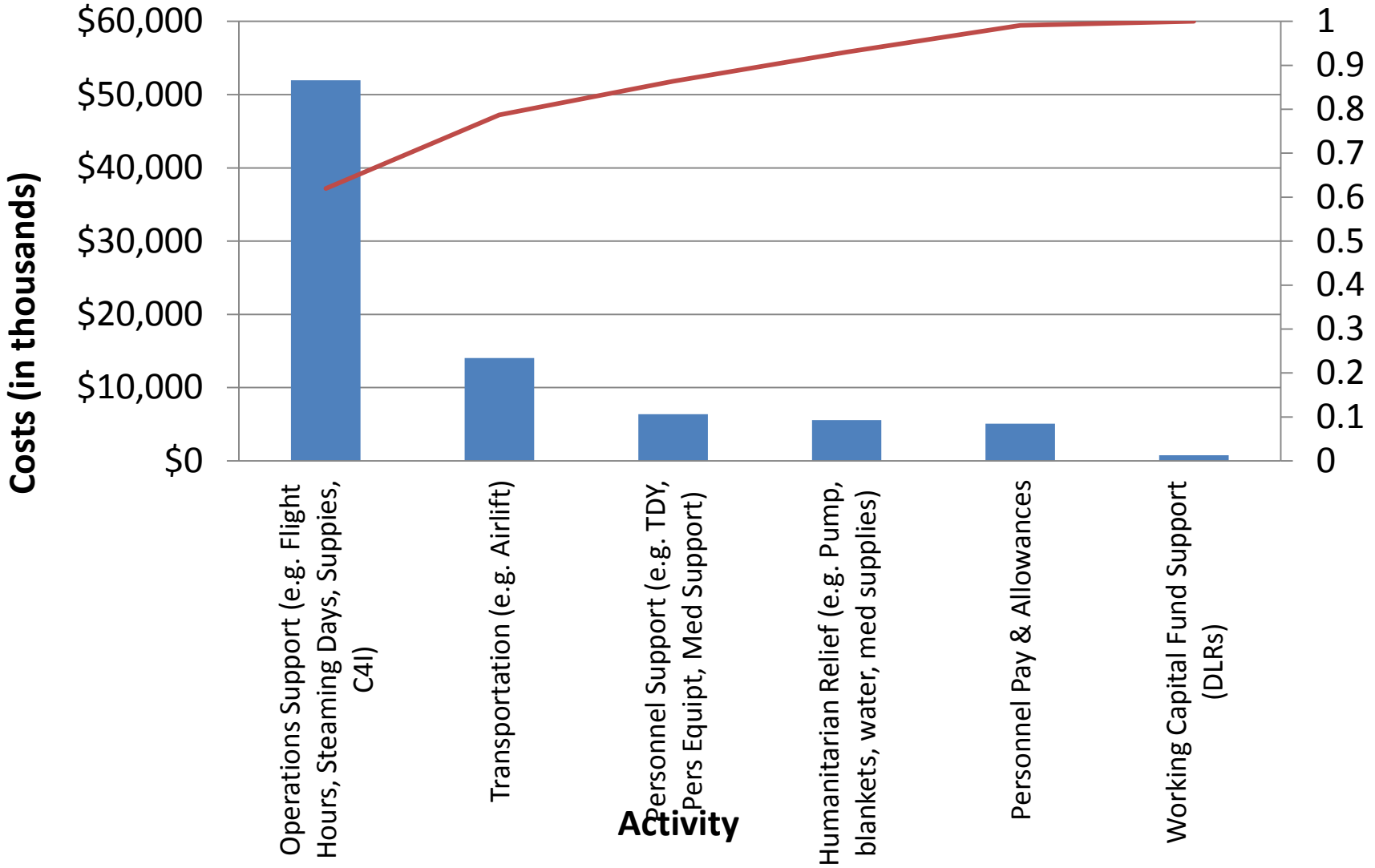

**Data source: Department of the Navy, Office of the Assistant Secretary of the Navy, Financial Management and Comptroller (OASN (FMC))*
*Data range: 11 March 2011 – 15 April 2011*

# *The Pacific Fleet had a significant response and therefore drove most of the costs*



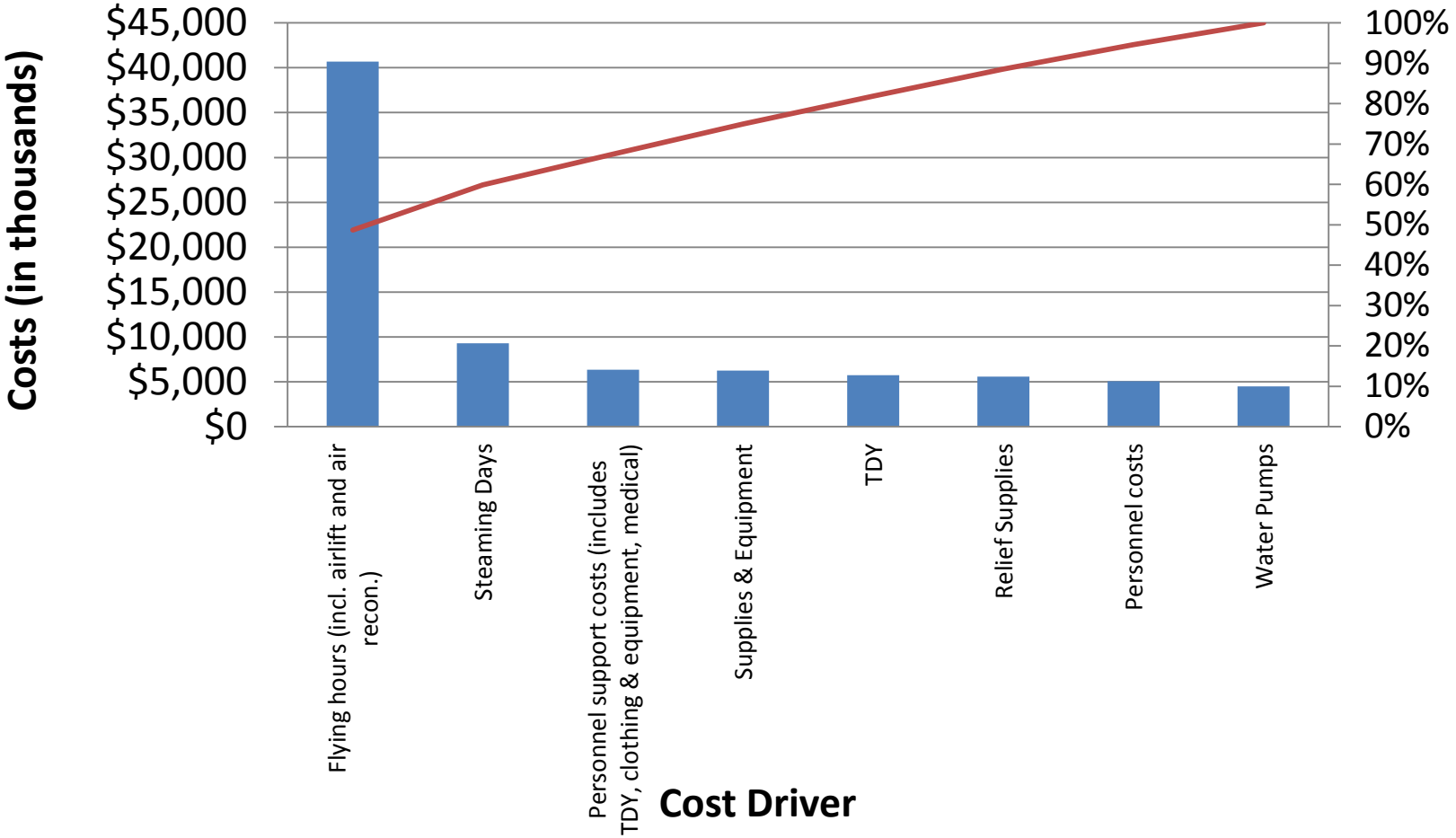

*Data source: Department of the Navy, Office of the Assistant Secretary of the Navy, Financial Management and Comptroller (OASN (FMC))
Data range: 11 March 2011 – 15 April 2011

# *"Operations support" was the primary cost driver and accounted for more than 60% of total costs*



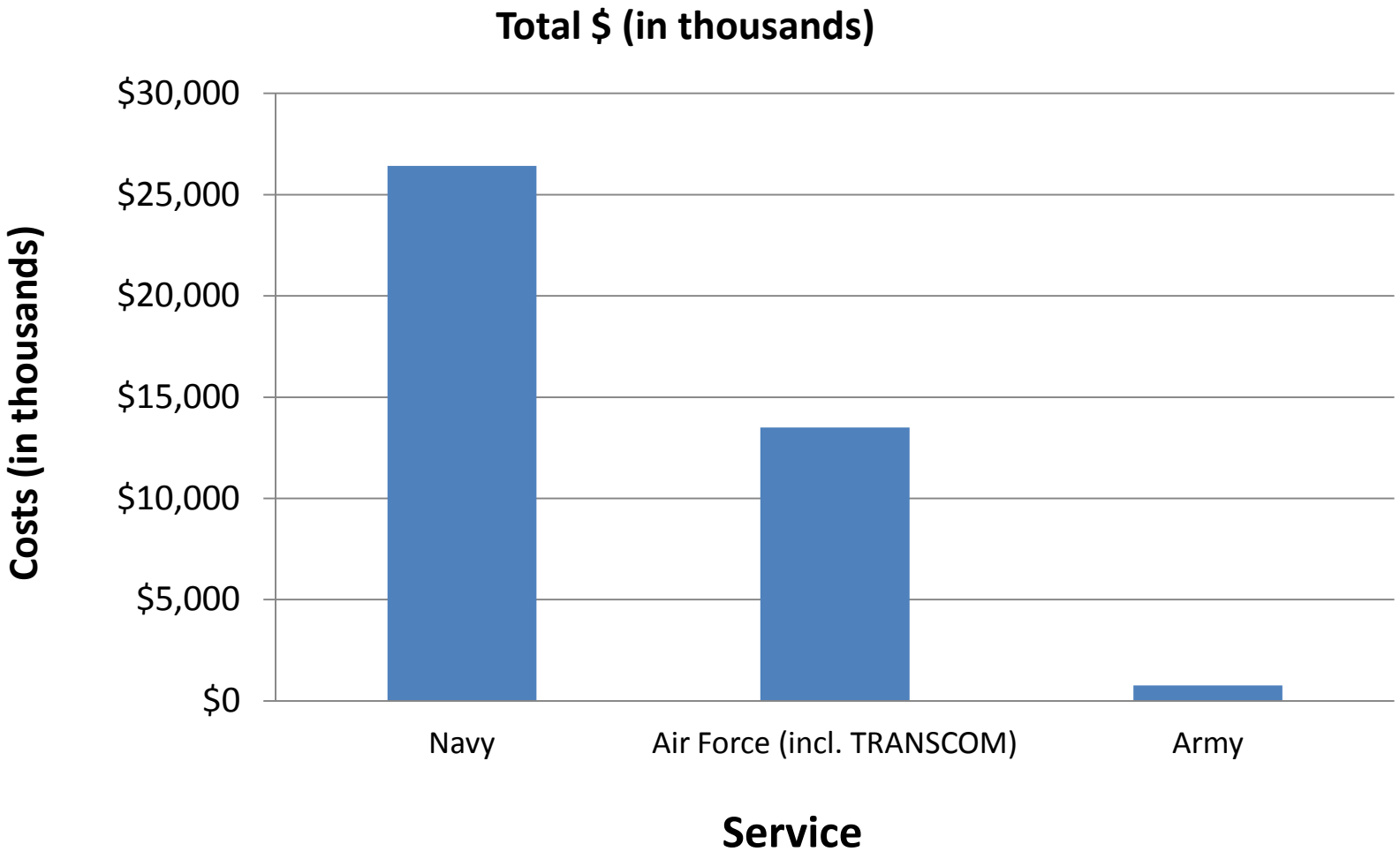

**Data source: Department of the Navy, Office of the Assistant Secretary of the Navy, Financial Management and Comptroller (OASN (FMC))*
*Data range: 11 March 2011 – 15 April 2011*

# *A breakdown of "operations support" activities shows that flying hours and airlift drive more than 40% of costs in that category*




*Data source: Department of the Navy, Office of the Assistant Secretary of the Navy, Financial Management and Comptroller (OASN (FMC))
Data range: 11 March 2011 – 15 April 2011

# *The US Navy provided the greatest number of aircraft in the first 30 days and drove most of the flying hour costs*






**Data source: Department of the Navy, Office of the Assistant Secretary of the Navy, Financial Management and Comptroller (OASN (FMC))*
*Data range: 11 March 2011 – 15 April 2011*

# *Pacific Fleet was the main cost driver for Navy flying hour costs*

| Aircraft Type | USMC | USN | Total | % of Total |
|---|---|---|---|---|
| Rotary Wing | $1,621,521 | $3,166,498 | $4,788,019 | 27% |
| Fixed Wing | $2,344,167 | $10,356,238 | $12,700,405 | 73% |

| | COMPONENT | | |
|---|---|---|---|
| AIRCRAFT TYPE | USMC | USN | TOTAL COSTS |
| FA-18C | | $1,955,153 | $1,955,153 |
| SH-60F | | $1,925,685 | $1,925,685 |
| KC-130J | $1,733,258 | | $1,733,258 |
| FA-18F | | $1,708,762 | $1,708,762 |
| C-2A | | $1,657,015 | $1,657,015 |
| FA-18E | | $1,654,170 | $1,654,170 |
| CH-46E | $1,480,954 | | $1,480,954 |
| P-3C | | $1,478,054 | $1,478,054 |
| E-2C | | $1,324,857 | $1,324,857 |
| HH-60H | | $745,684 | $745,684 |
| EA-6B | | $447,896 | $447,896 |
| MH-60S | | $380,010 | $380,010 |
| UC-35D | $327,027 | | $327,027 |
| UC-12F | $224,258 | | $224,258 |
| CH-53E | $140,568 | | $140,568 |
| C-12 | | $130,332 | $130,332 |
| SH-60B | | $115,120 | $115,120 |
| UC-12W | $59,625 | | $59,625 |
| **Total** | **$3,965,688** | **$13,522,736** | **$17,488,425** |



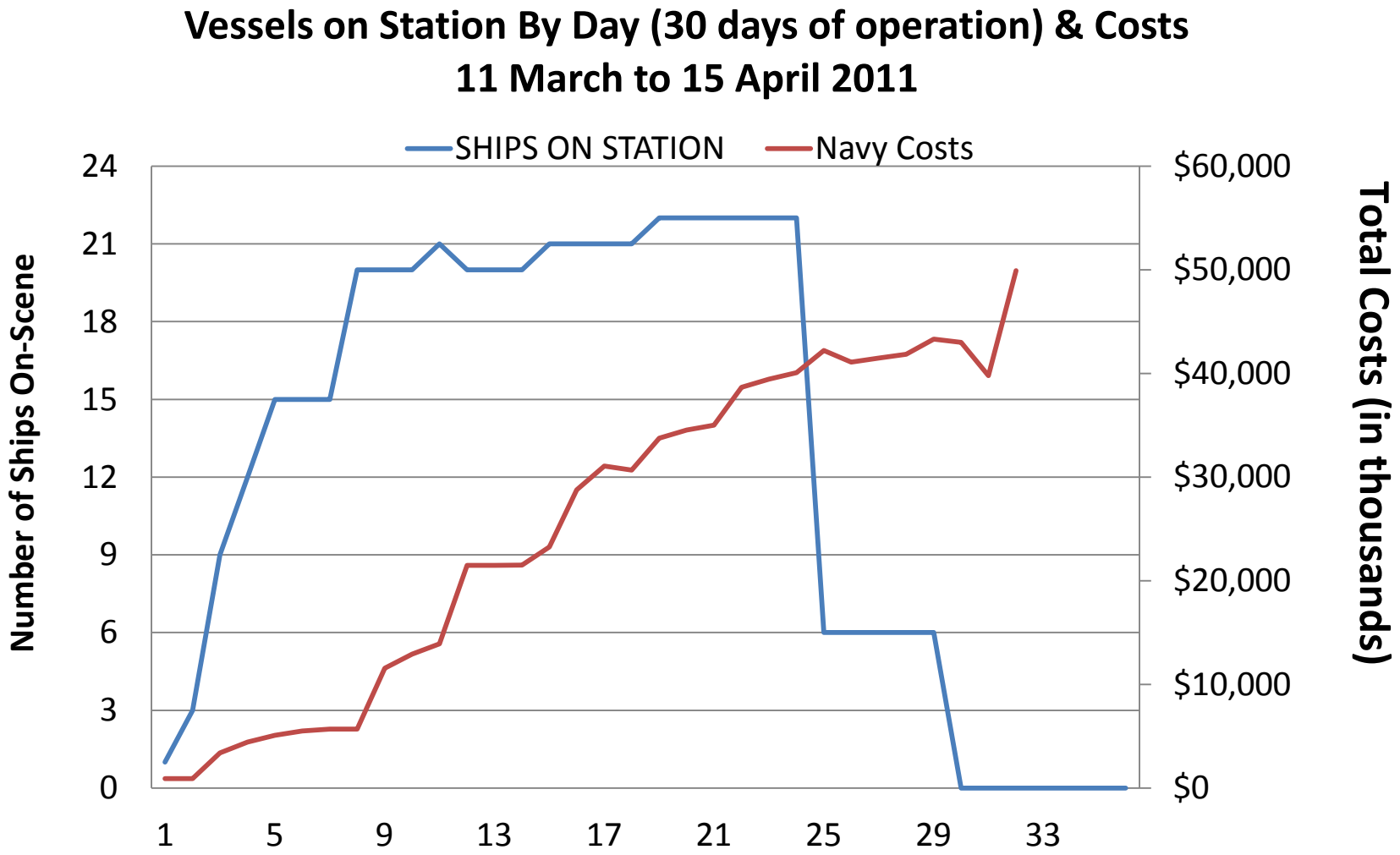
**Data source: Pacific Fleet (PACFLT) Comptroller*
*Data range: 11 March 2011 – 04 April 2011*

# *Navy Pacific Fleet flying hour costs excluding F/A-18s of all types*

| Aircraft Type | USMC | USN | Total | % of Total |
|---|---|---|---|---|
| Rotary Wing | $1,621,521 | $3,166,498 | $4,788,019 | 41% |
| Fixed Wing | $2,344,167 | $4,590,257 | $6,934,424 | 59% |

| | COMPONENT | | |
|---|---|---|---|
| AIRCRAFT TYPE | USMC | USN | TOTAL COSTS |
| SH-60F | | $1,925,685 | $1,925,685 |
| KC-130J | $1,733,258 | | $1,733,258 |
| C-2A | | $1,657,015 | $1,657,015 |
| CH-46E | $1,480,954 | | $1,480,954 |
| P-3C | | $1,478,054 | $1,478,054 |
| E-2C | | $1,324,857 | $1,324,857 |
| HH-60H | | $745,684 | $745,684 |
| MH-60S | | $380,010 | $380,010 |
| UC-35D | $327,027 | | $327,027 |
| UC-12F | $224,258 | | $224,258 |
| CH-53E | $140,568 | | $140,568 |
| C-12 | | $130,332 | $130,332 |
| SH-60B | | $115,120 | $115,120 |
| UC-12W | $59,625 | | $59,625 |
| Total | $3,965,688 | $7,756,755 | $11,722,444 |

# *A total of 23 Navy ships participated in Operation Tomodachi*






**Source: Kaczur, Aurelio, Joloya, 2012 & Department of the Navy, Office of the Assistant Secretary of the Navy, Financial Management and Comptroller (OASN (FMC))*

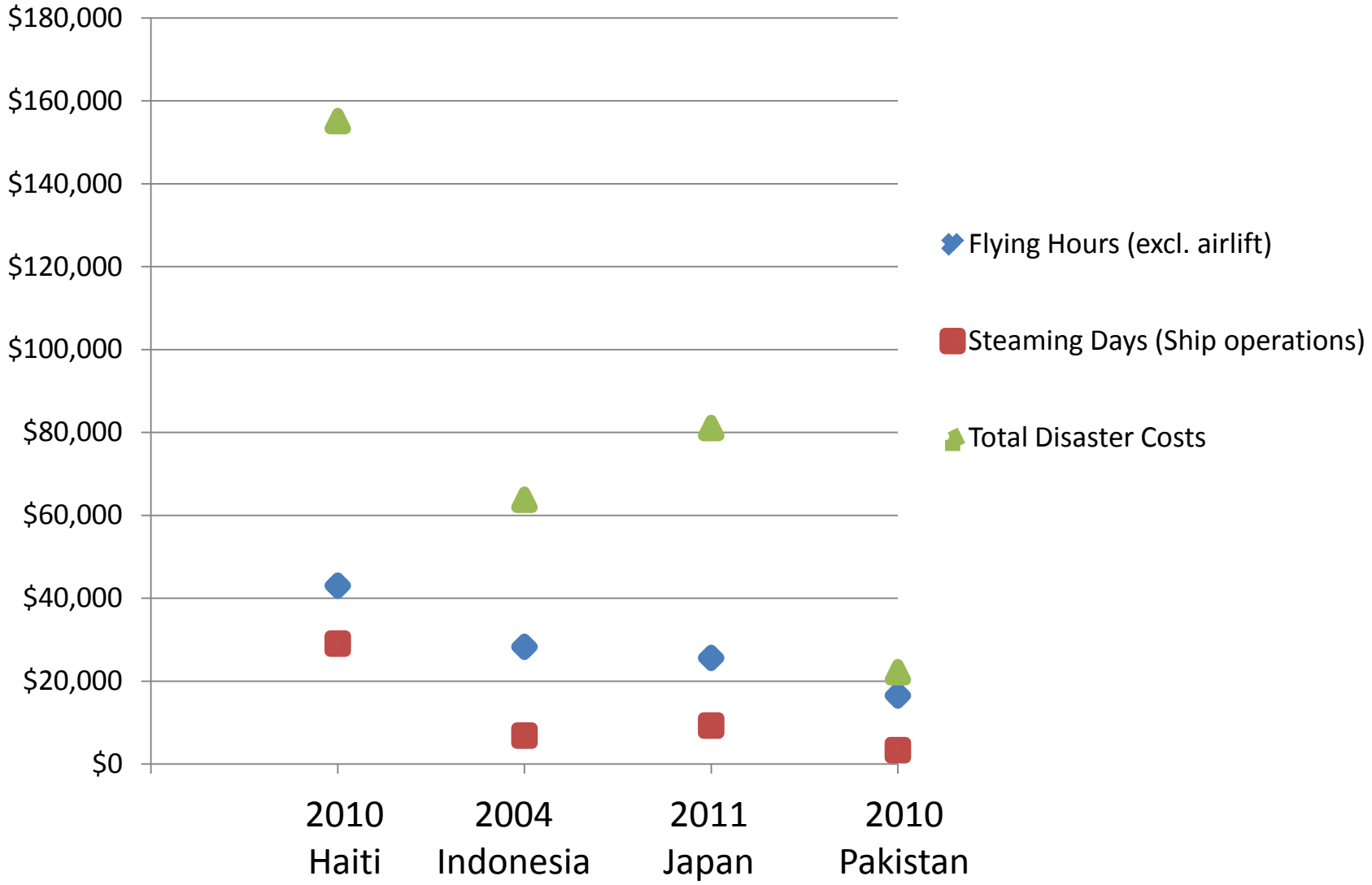
# *Flying Hour and Steaming Costs Compared to Total Costs*

| Event | Total Flying & Steaming $ | Total Disaster Costs | Flying Hrs & Steaming as % of Total | Flying Hrs as % of Total |
|---|---|---|---|---|
| 2010 Haiti Earthquake | $72,131 | $155,135 | 46% | 28% |
| 2004 Indonesian Tsunami | $35,178 | $63,775 | 55% | 44% |
| 2011 Japan Earthquake & Tsunami | $34,929 | $81,091 | 43% | 32% |
| 2010 Pakistan Floods | $19,909 | $22,181 | 90% | 75% |



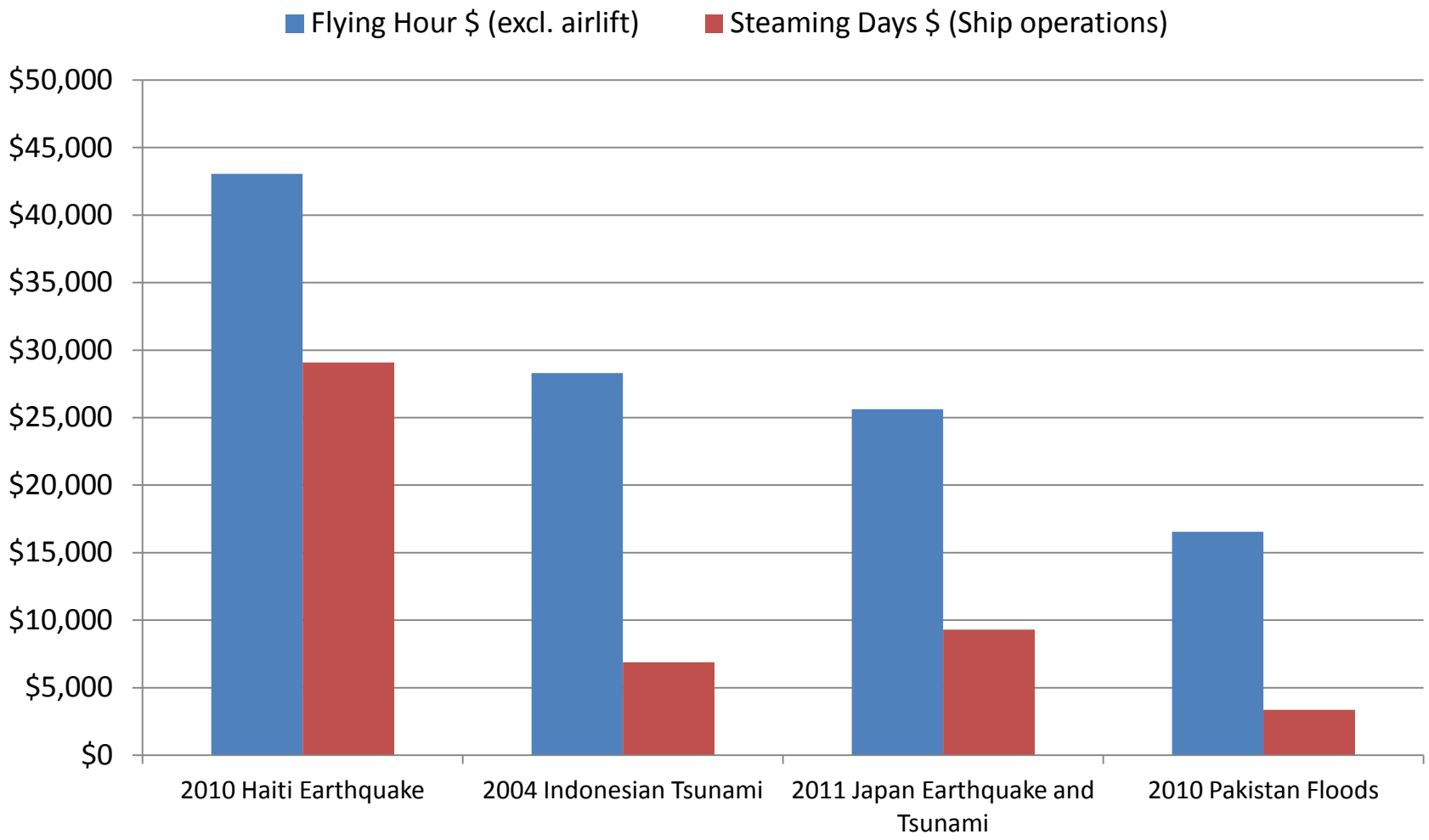
**Data source: Department of the Navy, Office of the Assistant Secretary of the Navy, Financial Management and Comptroller (OASN (FMC))*
*Data range: 11 March 2011 – 15 April 2011*

# *Flying Hour and Steaming Costs Compared to Total Costs*




**Data source: Department of the Navy, Office of the Assistant Secretary of the Navy, Financial Management and Comptroller (OASN (FMC))*
*Data range: 11 March 2011 – 15 April 2011*

# *Flying hours and steaming costs for Haiti, 2004 Indonesian Tsunami, 2011 Japan Earthquake and 2010 Pakistan floods*



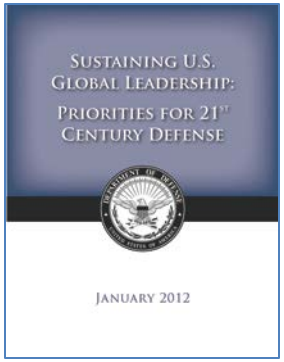
# *Conclusions*

- There have been 4 studies on operations and costs of disasters
  - These studies have changed the way we think about the cost drivers
    - Not just personnel costs -- flying time tends to be the largest driver, the number of ships you send as well as ship type has significant cost consequences

- Flying hours and steaming time are the biggest cost drivers

- Navy is a significant DoD participant in HA/DR
  - More of the world population is moving to coastal (littoral) areas
  - Navy can access the coastal (littoral) areas with specialized equipment utilizing specialized skills
  - Not just about moving materiel – other capabilities –especially nuclear expertise – that are important depending upon the disaster

- If HA/DR operations are a primary mission of the U.S. Armed Forces as defined by key part of our national security strategy as outlined in *Priorities for 21st Century Defense* (p.6), then such operations should be considered during the planning and development of programs that support operations (such as shipbuilding, calculation of aircraft life, etc.)




NAVAL
POSTGRADUATE
SCHOOL