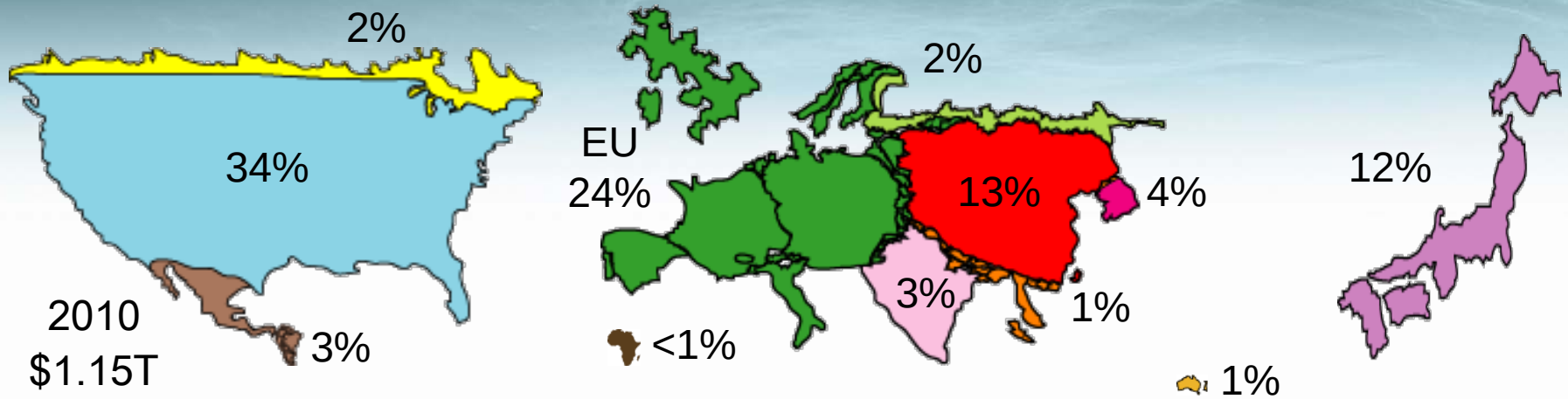
2012

ONR Naval S&T Partnership Conference & ASNE Expo

ONR Global

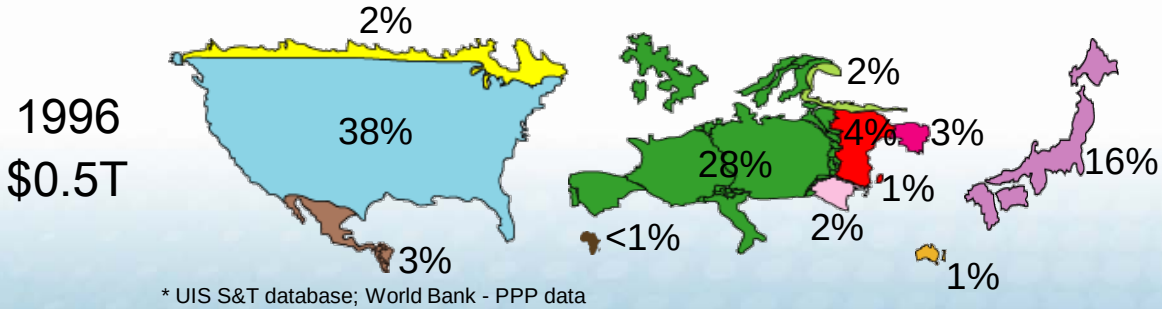
Captain Mike Smith, U.S. Navy
Commanding Officer, Office of Naval Research Global
Oct 2012

Total Global R&D Investment Growth



** OECD 2010 PPP; 2010 Global R&D Report (Battelle)

+100%
Growth in Global S&T Investment



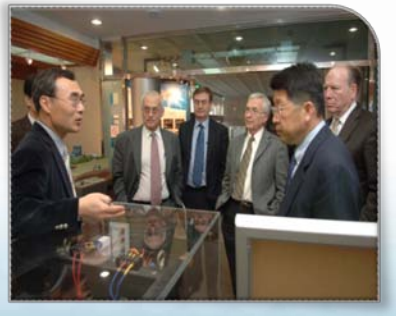
* UIS S&T database; World Bank - PPP data

Rapidly Evolving S&T Environment

- Global S&T Investment **dynamics are changing** the landscape of the international community
  - Trend is forecast to **continue/accelerate**
  - Over last decade China **increased S&T 20%/yr**
  - EU FP7 has ~ **€10B annual budget**
- Increased opportunity to **find innovative S&T** across globe
  - Also, increased **potential for technology surprise**
- ONRG is seeing significant **increased demand** for its services as result of current trends

ONR Global Forward Presence

- **No Corner on the S&T Market**
  - Not all threats can be countered by traditional weapons system
  - Low cost, available technology is leveling the playing field
  - Enemies fearing less and catching up to speed
  - Cultural immersion allows SAs and ADs to experience S&T and understand the world from an insider's perspective
  - Creating a positive view of the US in a non-threatening light
  - Establishing awareness and functioning as a global outpost
  - Being embedded in Fleet, Force and COCOM staffs enhances connectivity with the warfighter



The World is Becoming Flatter

Recent Comments on S&T

- DSB Report on Basic Research (January 2012)
  - An increasing fraction of the **world's basic research is being conducted outside the U.S.** as part of a larger trend toward the **globalization of science**. In order to avoid technological surprise, it is **important for DoD to be involved in the cutting edge of basic research** on topics of specific interest to DoD - whether the cutting edge is in the U.S. or overseas.
- Assistant Secretary of Defense for Research and Engineering
  - 19 March 2012 Secretary Lemnios Memo irt DSB Report on Basic Research
    - Leveraging the **globalization of basic research by increasing and facilitating collaboration** of U.S. and leading foreign scientists in both the U.S. and abroad.
  - 17 March 2012 Slide Presentation by Dr. Robin Staffin
    - Action 1.5: **Double current funding of DoD international activities**, currently 2-3% of BA 1 funds, over a five year period.
- Admiral Greenert
  - 21 September 2011 *"CNO Sailing Directions"*
    - "**Foster and sustain cooperative relationships with** an expanding set of allies and **international partners** to enhance global security"
  - 19 October 2011 International Seapower Symposium
    - "We are in a time of unprecedented **global interdependence**" …. "it's a time of budget constraints, so we've got to **innovate**, we've got to **share capabilities, share technologies**, and be willing to **work together**."

ONRG Mission and Objectives

Search for promising, *emerging scientific research and advanced technologies* to enable ONR to effectively address current needs and *investigate and assess revolutionary, high-payoff technologies* for future missions and capabilities.

Discovering the Best Science

- Innovative basic research
- Help shape future Naval investments / strategies
- Leveraging great minds globally with positive engagement
- Supporting Sailors & Marines

Maintain Global Technical Awareness

- Prevent technological surprise
- Basic research is most transparent
- Contributing open source data to Global Technology Awareness

Science & Technology Partnerships and Collaborations

- Advancement of mutual beneficial science
- Supports Theater Security Cooperation goals
- Relevance to USN/USMC programs is a key factor

Seeking S&T solutions globally as determined by CNR, DoN, DoD and USG

ONRG History

- **1946 – ONR London Office** created to survey, assess, and report on European S&T activities
- **1974 – ONR Tokyo Office** opened to liaise and assess Asian S&T activities
- **1977** – ONR London and Tokyo Offices combined to form the **International Field Office** (IFO) to implement integrated DoN S&T strategy for fostering international collaboration
- **2000** – Tokyo Office expands its presence with a Singapore detachment
- **2002** – IFO opens **Santiago Office**
- **2003 – Office of Naval Research Global** established through merger of Naval Fleet/Force Technology Innovation Office and IFO
- **2006** – ONRG opens **Singapore Office**
- **2009** – Director, Navy Staff designated ONRG an **Echelon II Command** reporting directly to CNR
- **2010** – ONRG opens **Prague Office**

LONDON

TOKYO

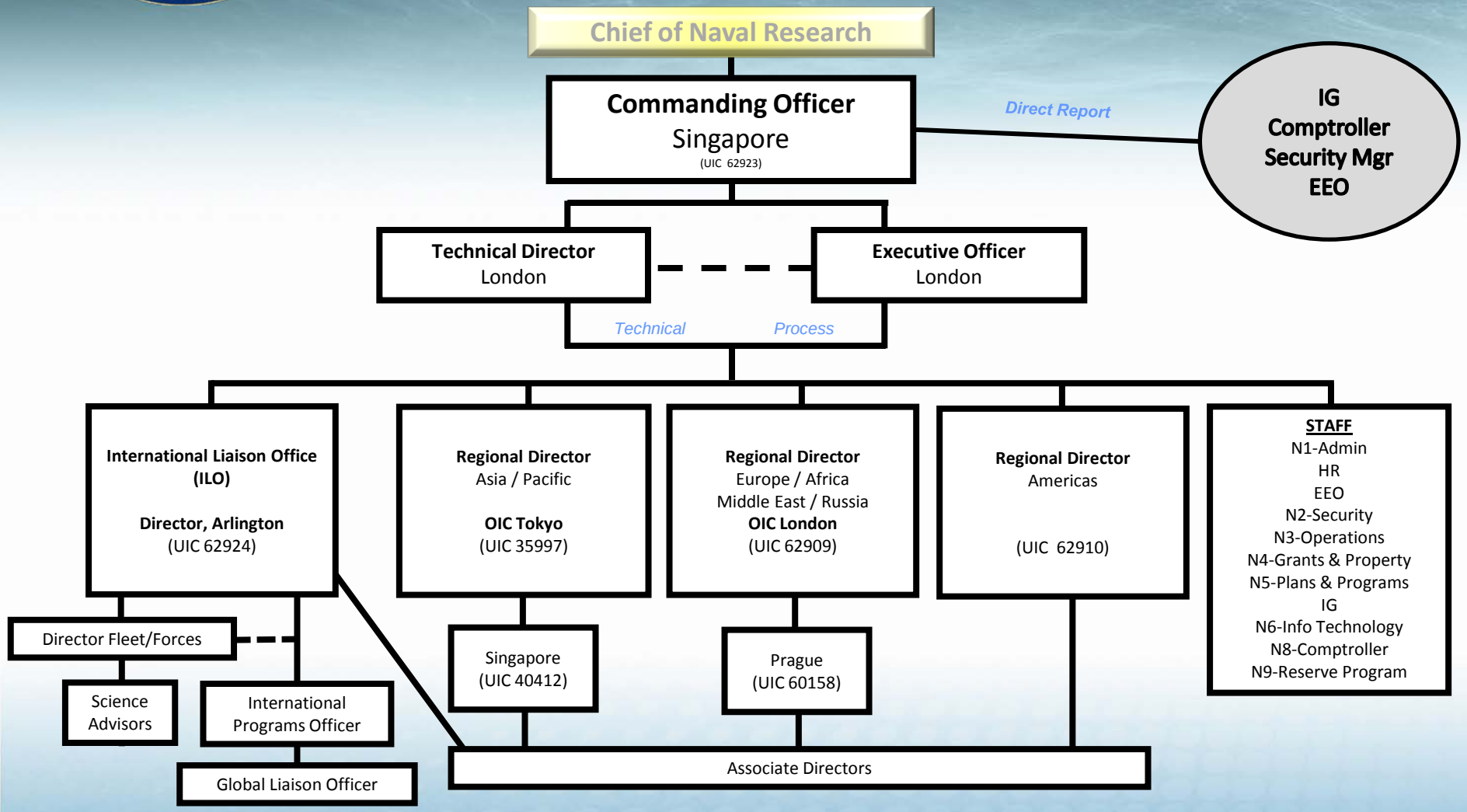
SINGAPORE

SANTIAGO

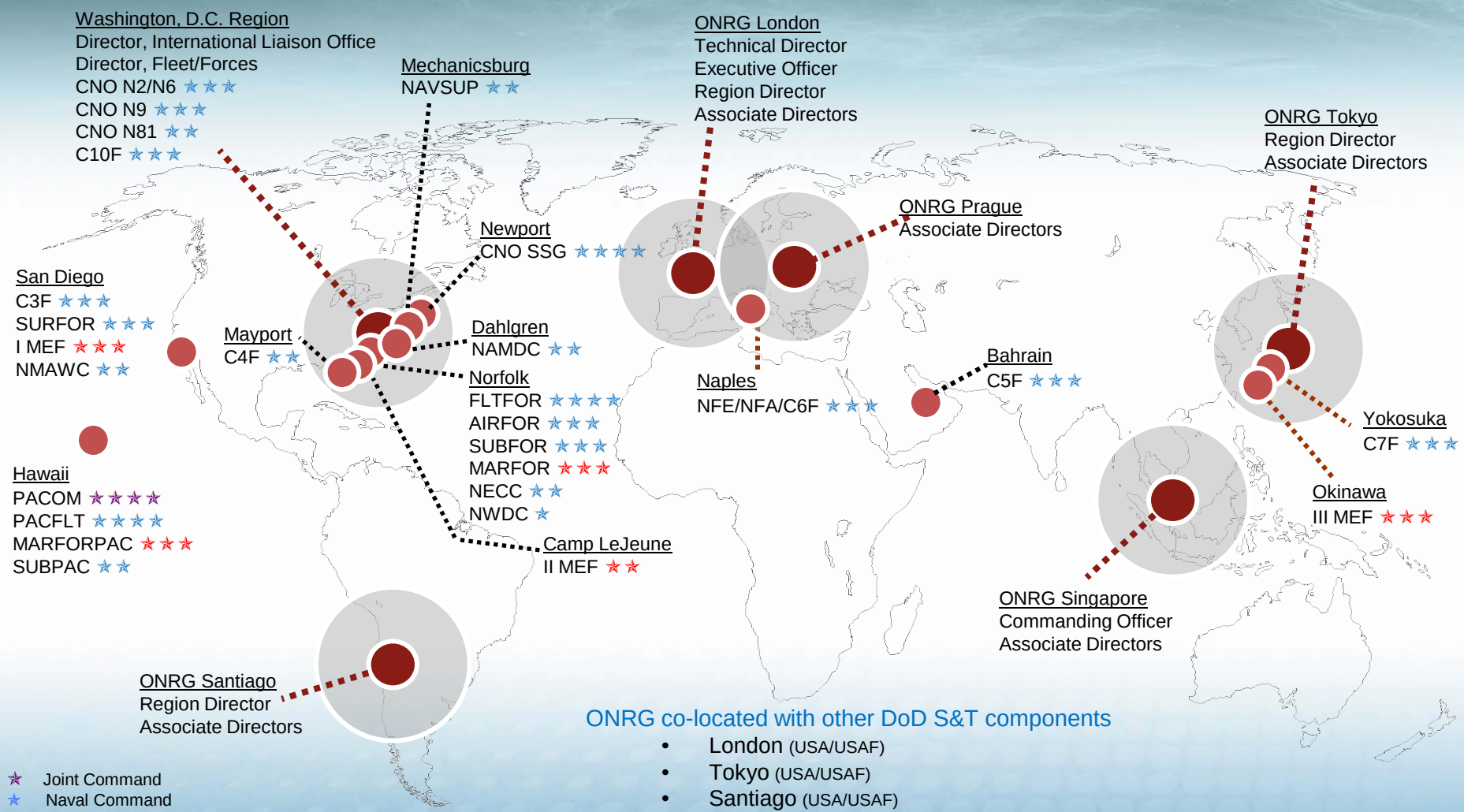
PRAGUE

ARLINGTON

ONRG Organization



ONRG Presence



ONRG co-located with other DoD S&T components

- London (USA/USAF)
- Tokyo (USA/USAF)
- Santiago (USA/USAF)
- Singapore (USA only)

★ Joint Command
★ Naval Command
★ Marine Corps Command

World Class S&T Talent

ONR Global personnel positioned across the world

- International Science Program 20 Associate Directors (AD)
  - Global technology scouts assigned to ONR Global's regional offices in Singapore, London, Prague, Tokyo, & Santiago
  - Predominantly PhD-level scientists well versed in basic and applied research
  - Critical skills such as languages, regions and exposure (industry, academia, laboratories, military, etc.)
- Science Advisor Program 27 Science Advisors (SA)
  - CNR's Ambassadors to USN/USMC operators assigned to Joint, Navy and Marine Corps commands as S&T expert advisors
  - Provide emerging challenges, gaps and requirements to NRE and provide solutions to operational needs
  - Coordinate experimentation and prototypes development
  - Predominantly Masters-level engineering scientists experienced with the U.S. Naval acquisition process

International Science Program Tools

Collaborative Science Program (CSP)

- Support non-US workshops and conferences of Naval interest

Visiting Scientist Program (VSP)

- Support travel of non-US scientists to US to socialize new S&T ideas or findings with NRE

Naval International Cooperative Opportunities Programs (NICOP)

- Support insertion of innovative, international S&T into core ONR, NRE, & DoD S&T Programs

Liaison Visits (Not a Grant)

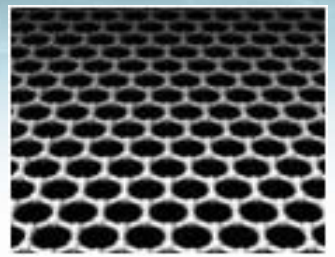
- ONRG technical staff visit international institutions to develop access and discover cutting edge S&T

ONRG provides seed funding for innovative research

ADs Making a Difference

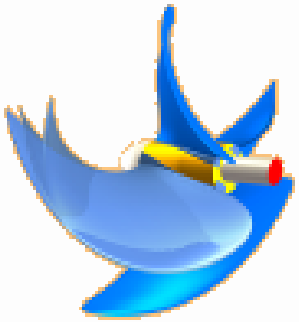
Graphene

- A single layer of carbon atoms arranged in a honeycomb pattern that is considered to be the strongest material ever discovered. It conducts electricity better than silicon. ONR Global partnered with UK's Dr Geim, who was awarded the 2010 Nobel Prize in Physics for his research on graphene.



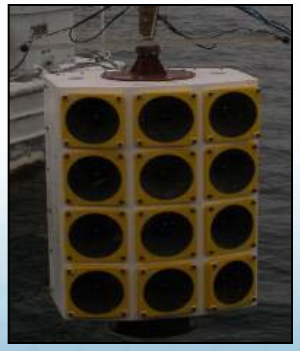
Reducing total life-cycle costs

- Pitch-Adapting Propeller - a propeller blade tip redesign deform as it rotates provides improved efficiency, lower maintenance and life-cycle cost savings, scheduled to be introduced to the Fleet in 2014. ONR Global partnered with Germany.

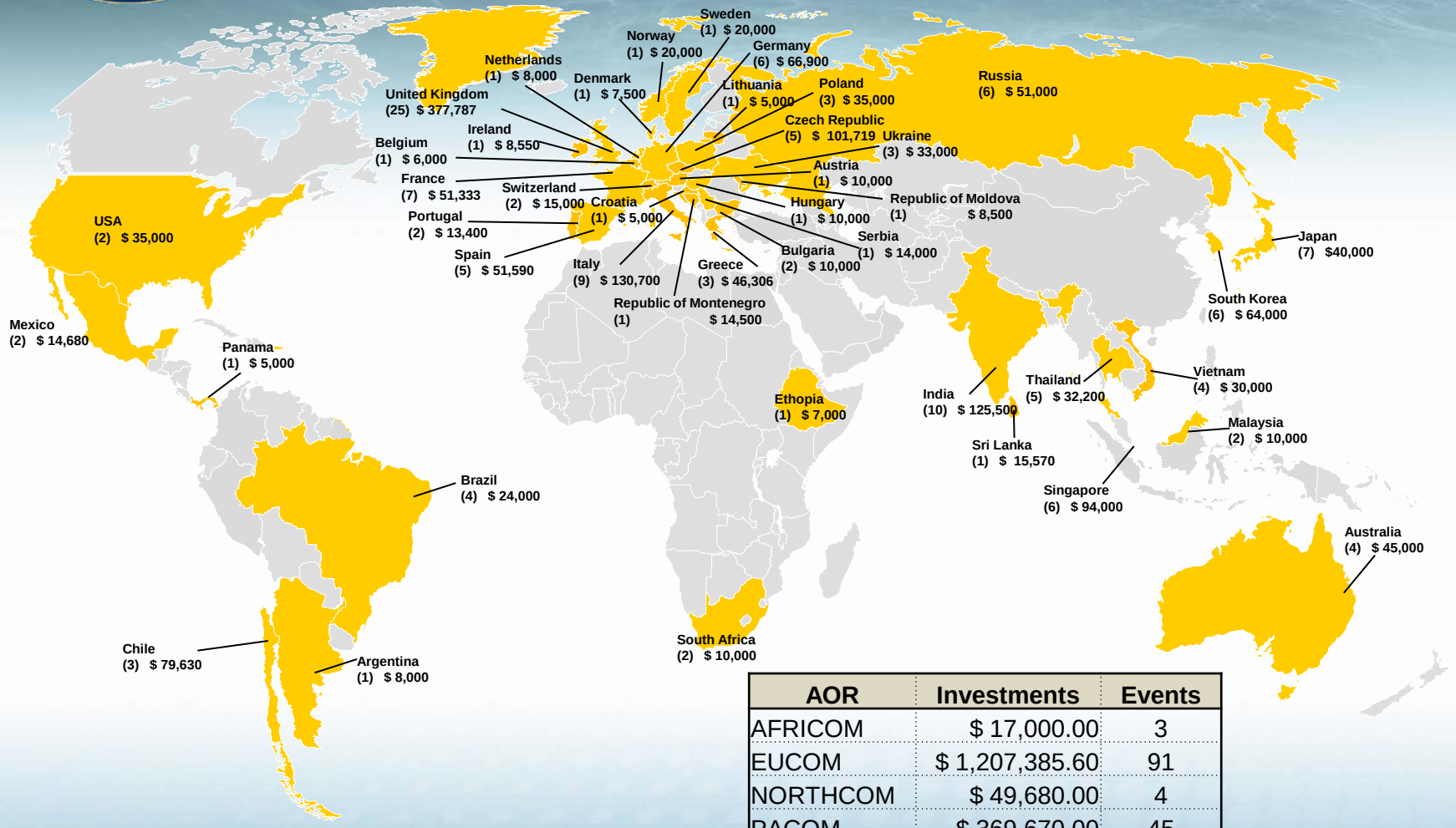


Waterway security

- Swimmer Detection - a network comprised of multiple low-cost sonar nodes that reduce interference from scattered underwater noise as well as number of false targets. ONR Global partnered with Singapore.



FY12 CSPs

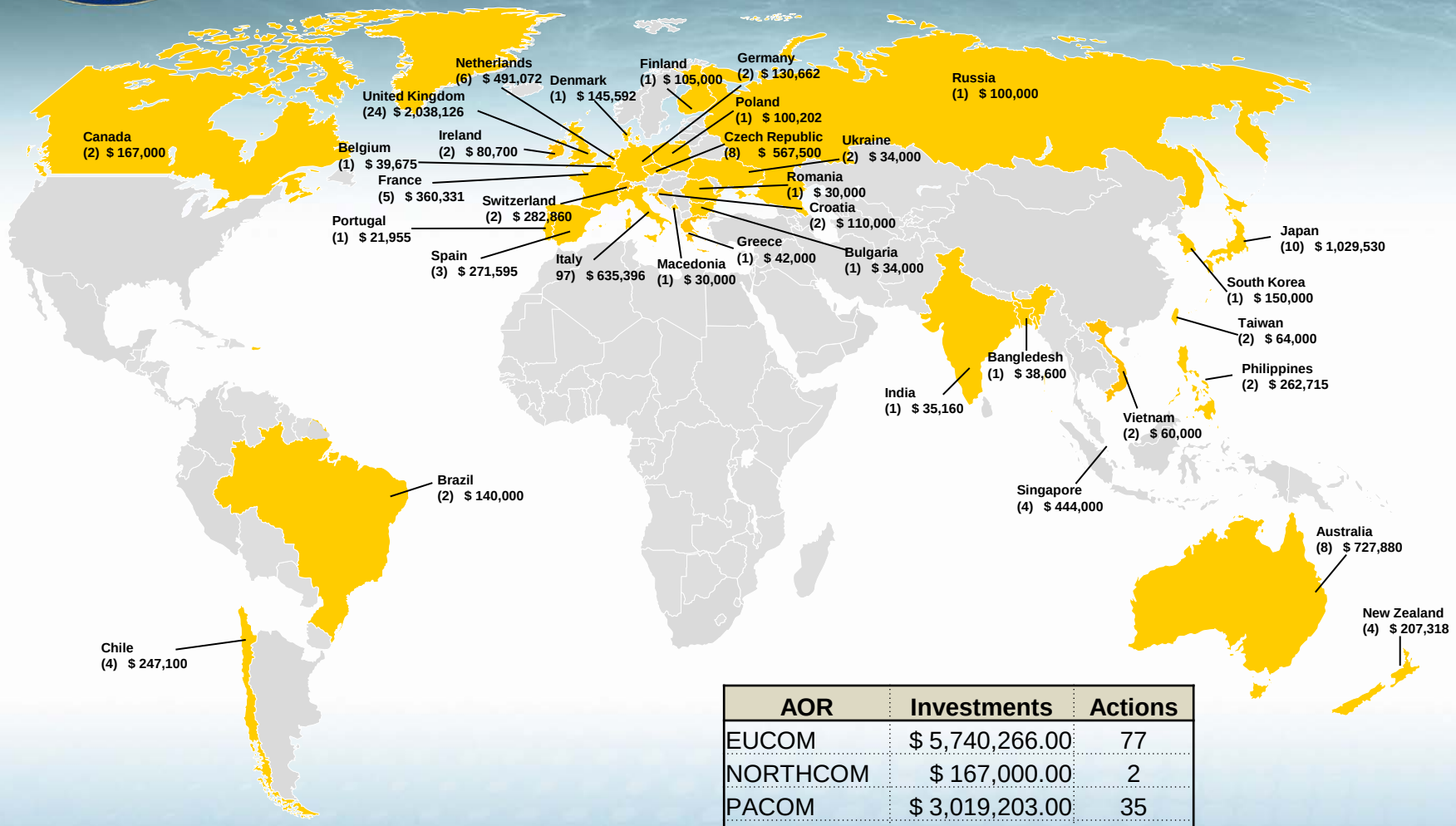


AOR	Investments	Events
AFRICOM	$ 17,000.00	3
EUCOM	$ 1,207,385.60	91
NORTHCOM	$ 49,680.00	4
PACOM	$ 369,670.00	45
SOUTHCOM	$ 116,630.00	9
Totals	$1,760,365.60	152

FY12 VSPs

AOR	Investments	Visits
EUCOM	$ 161,066.00	44
NORTHCOM	$ 13,949.00	4
PACOM	$ 24,419.00	8
SOUTHCOM	$ 45,440.00	12
Totals	$ 193,778.00	68

FY12 NICOPs



AOR	Investments	Actions
EUCOM	$ 5,740,266.00	77
NORTHCOM	$ 167,000.00	2
PACOM	$ 3,019,203.00	35
SOUTHCOM	$ 387,100.00	6
Totals	$ 9,313,469.00	120

Science Advisor Program Tools

- **Future Naval Capabilities (FNC):** work to mature technology into requirements driven, transition-oriented Navy products (~3-5 years; ~$10-30M each)

- **Joint Concept Technology Demonstration (JCTD):** addresses Joint war fighting gaps with mature technology solutions and demonstrated CONOPS (~2-5 years; ~$10-50M each)

- **Rapid Technology Transfer (RTT):** rapidly transition technology into programs of record to meet emergent / urgent naval need (~1-2 years; ≤$2M each)

- **Tech Solutions:** provides near-term prototype solutions to naval needs (~ <14 months; ≤$1M each)

Science Advisors Making a Difference

Operation Tomodachi (Response to Japan Earthquake & Tsunami):

- Set up an S&T cell to provide tech insertion, assessment of radiological status, airborne plume modeling, reactor status, and hydrodynamic modeling and ocean monitoring.

Riverine & Intercoastal Operations (RIO) JCTD:

- Real-time distributed surveillance and communications networks
- Persistent joint and coalition warfighter riverine presence
- NICOP funds used by COTECMAR Team to support the Colombian participation in RIO

Regional Maritime Awareness Capability (RMAC):

- Coastal surveillance program to provide awareness of sea traffic
- Concept established by NAVEUR/C6F Science Advisor
- Gulf of Guinea
- Supported the creation of the Sao Tomean Coast Guard

S&T Deployment to Afghanistan:

- The I MEF Science Advisor deployed to theater to gain awareness and utility of S&T capabilities
- Obtained a deeper understanding of warfighter S&T needs

Summary

- Evolving trends in international S&T
- ONRG has a long and established history
- Mission
  - Find, support and fund innovative S&T globally and ensure awareness of those technologies is communicated to our customers
  - Facilitate partnership/collaboration building by introducing international technologists/researches to our customers
- Programs
  - International Science Program (Liaison visit, VSP, CSP and NICOP)
  - Science Advisor Program (FNC, JCTD, RTT, Tech Solutions)
- Partnerships
  - ONR, NRE, SYSCOMs, DoD/N HQs, other Departments/Agencies, Allies/Partners, EU/NATO/Coalitions, Int'l industry and academia
- Presence
  - 5 international offices + liaison office at ONR HQ and 27 Joint/Navy/Marine Corps staffs