UNIVERSITY OF GUAM
INFORMATION TECHNOLOGY
EDUCATE. INNOVATE. CONNECT.

CALIFORNIA STATE UNIVERSITY
FULLERTON

GOREX: Guam Open Research & Education eXchange Updates

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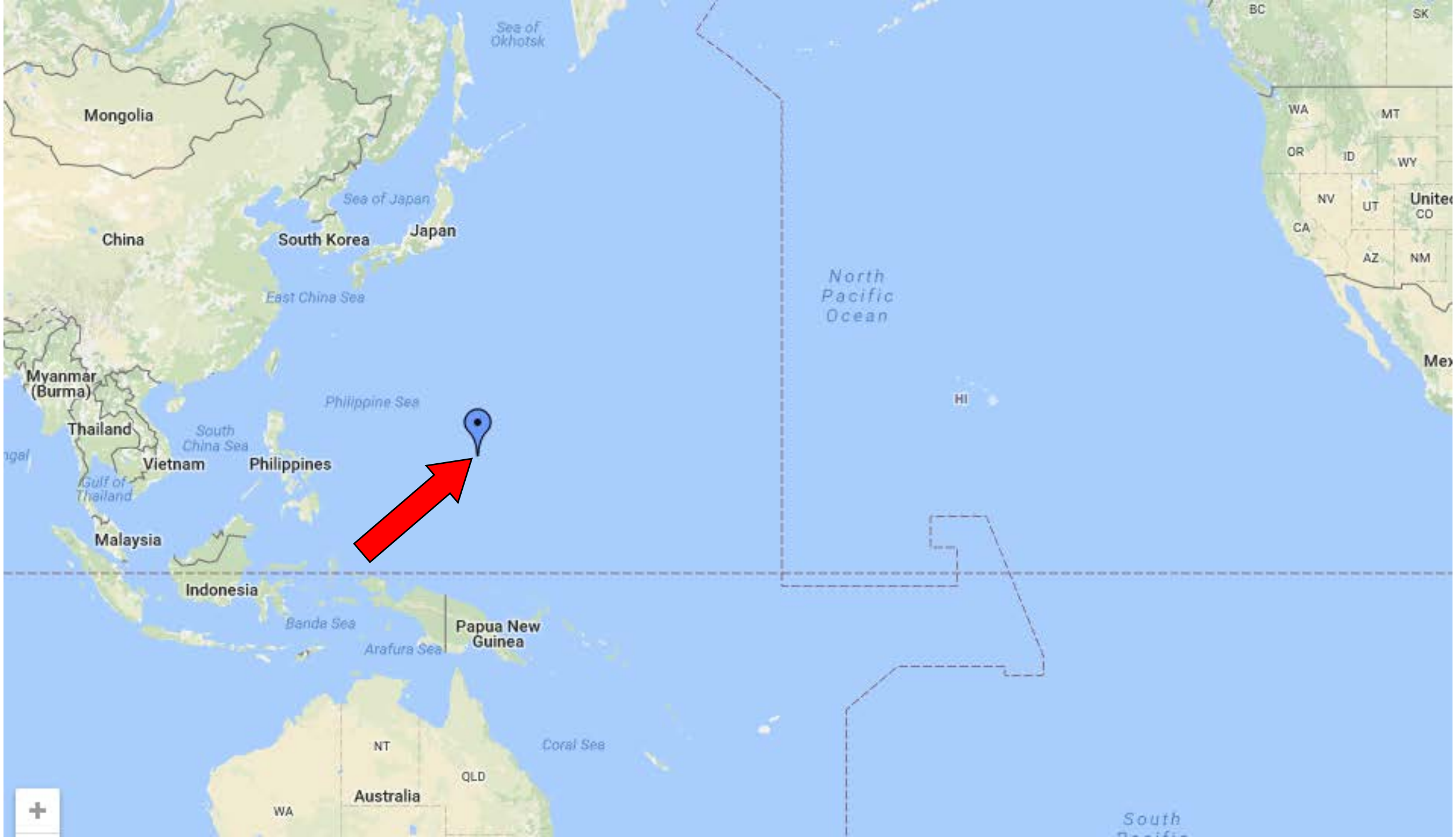
California State University, Fullerton - Division of Information Technology

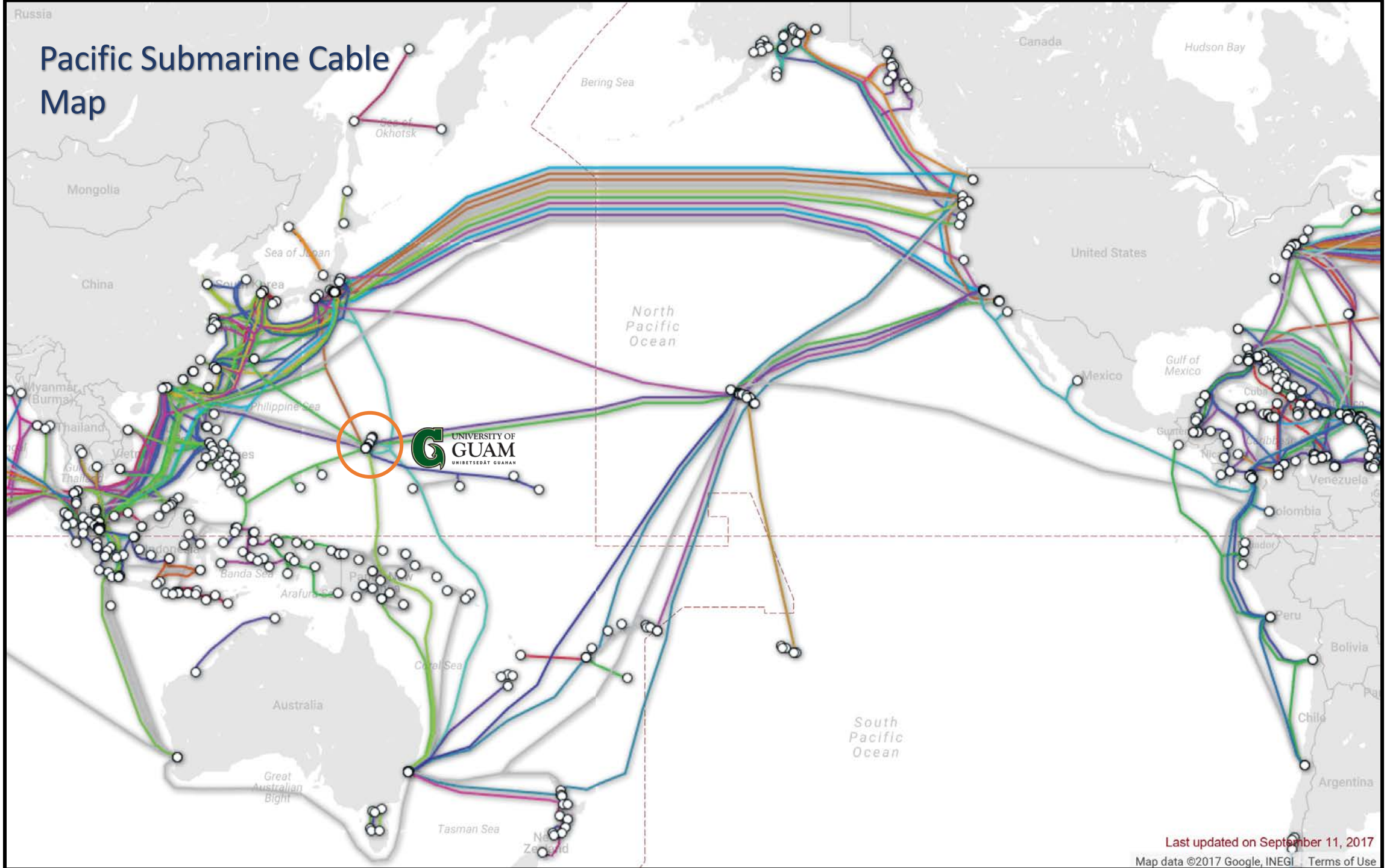
Americas' Research Platform (AmRP) Working Group Updates

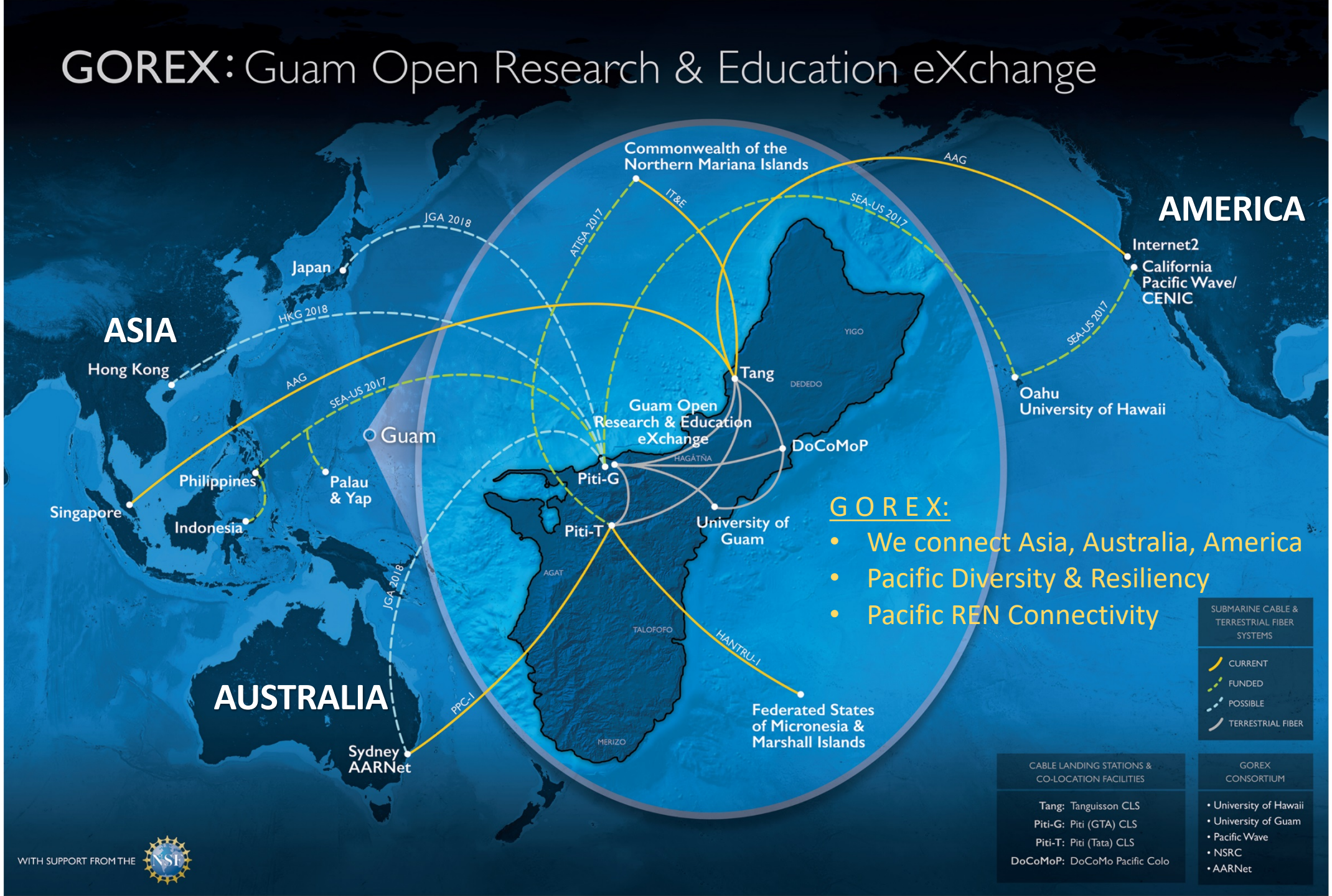
September 17, 2019


Sea of Okhotsk
Mongolia
Sea of Japan
China
South Korea
Japan
East China Sea
North Pacific Ocean
Philippine Sea
Myanmar (Burma)
Thailand
South China Sea
Vietnam
Philippines
Gulf of Thailand
Malaysia
Indonesia
Banda Sea
Arafura Sea
Papua New Guinea
Coral Sea
NT
QLD
Australia
WA
BC
SK
WA
MT
OR
ID
WY
NV
UT
CO
CA
AZ
NM
HI

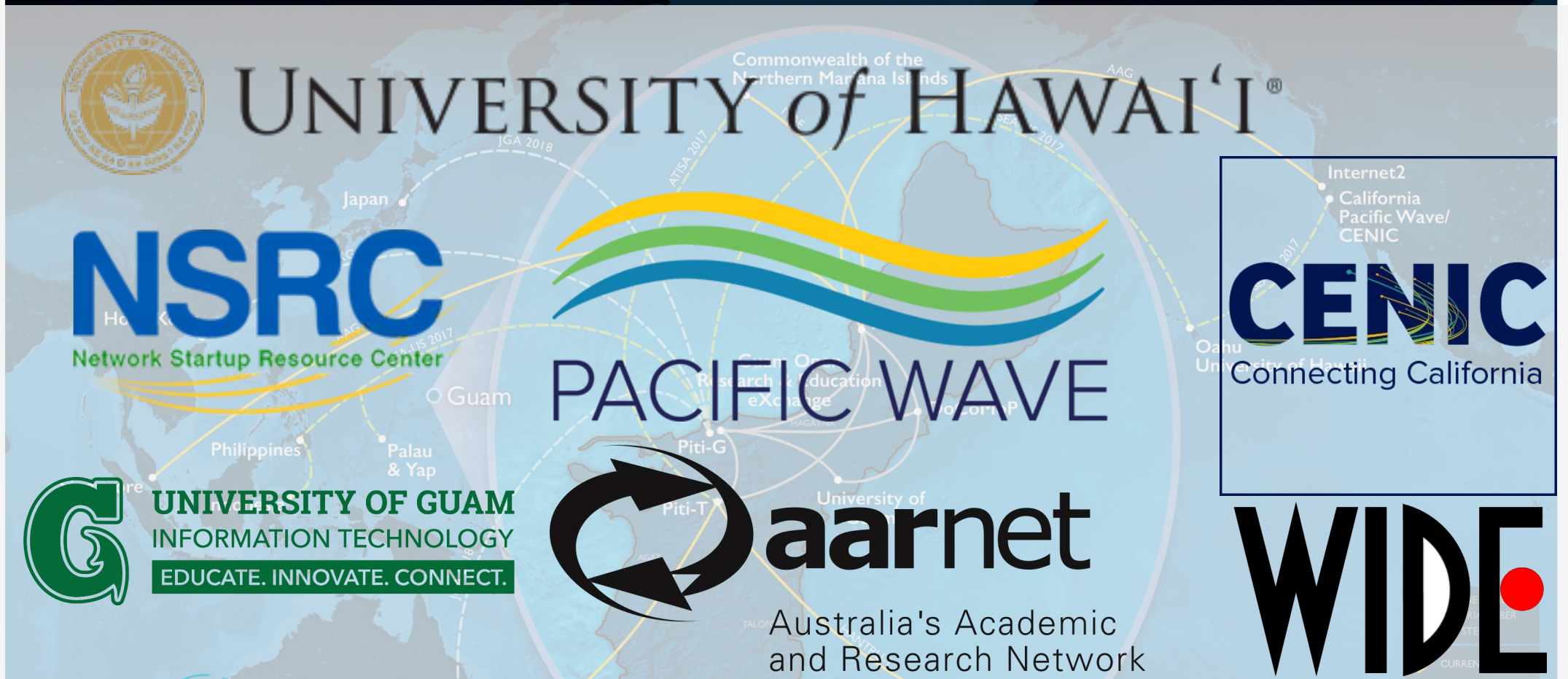
Strategic Connectivity Waypoint

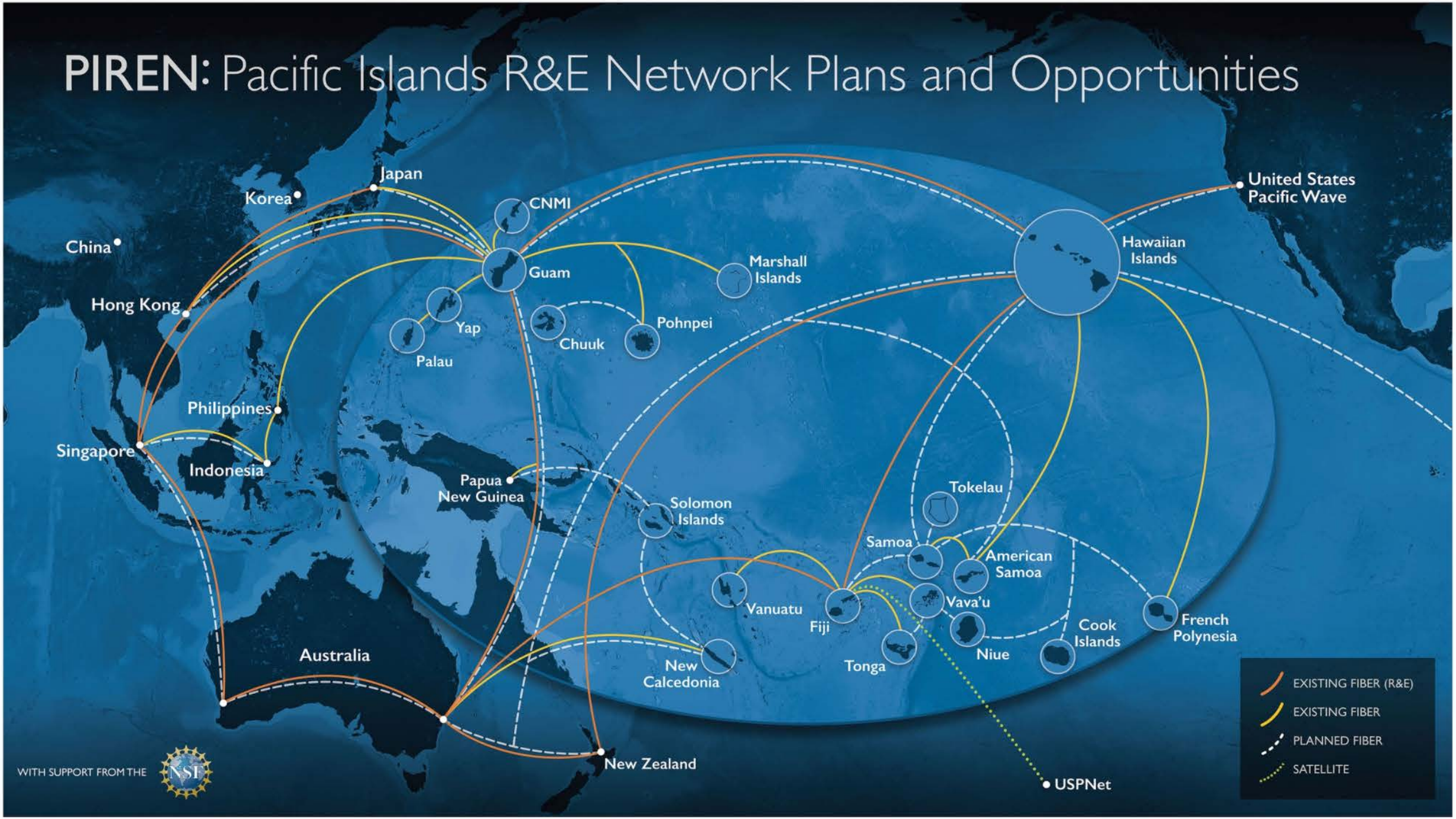
Pacific Submarine Cable Map

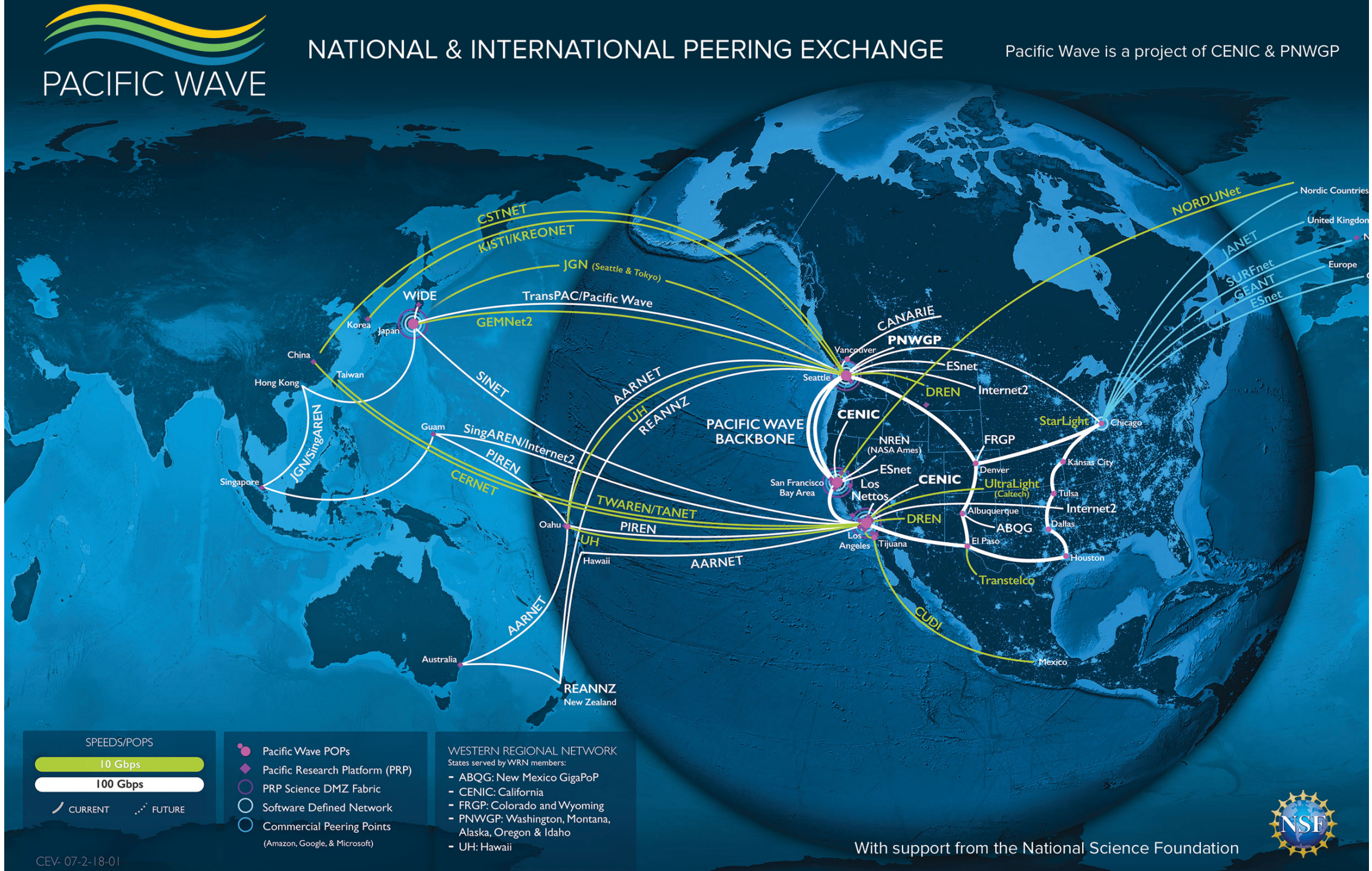


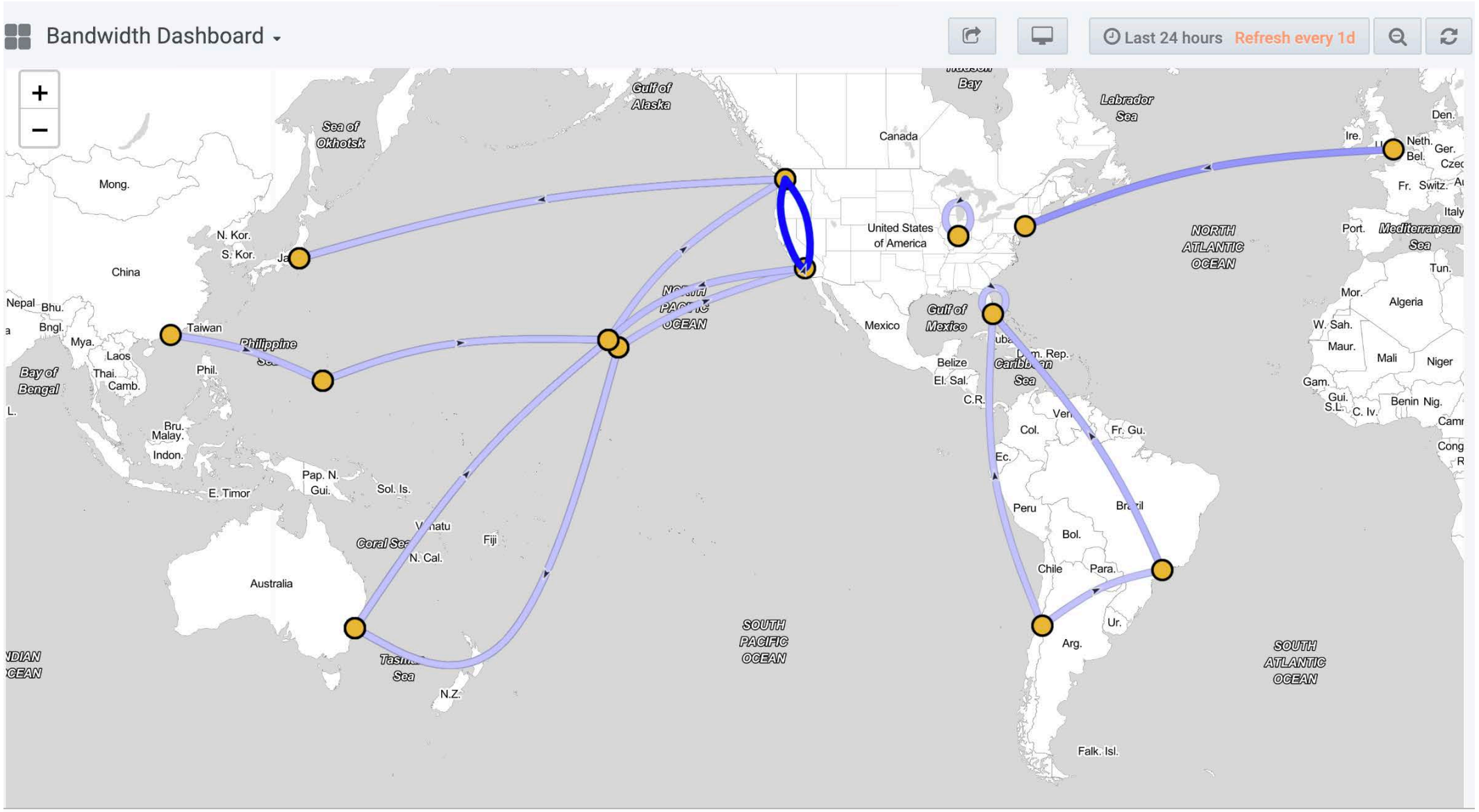

GOREX: Guam Open Research & Education eXchange
Commonwealth of the Northern Mariana Islands
AMERICA
Internet2
California Pacific Wave/ CENIC
Oahu University of Hawaii
AAG
SEA-US 2017
IT&E
ATISA 2017
JGA 2018
Japan
HKG 2018
ASIA
Hong Kong
Singapore
Philippines
Indonesia
Palau & Yap
Guam
Guam Open Research & Education eXchange
Tang
YIGO
DEDEDO
DoCoMoP
HAGÅTÑA
Piti-G
Piti-T
University of Guam
AGAT
TALOFOFO
MERIZO
HANTRU-1
Federated States of Micronesia & Marshall Islands
PPC-1
Sydney AARNet
AUSTRALIA
G O R E X:
• We connect Asia, Australia, America
• Pacific Diversity & Resiliency
• Pacific REN Connectivity
SUBMARINE CABLE & TERRESTRIAL FIBER SYSTEMS
CURRENT
FUNDED
POSSIBLE
TERRESTRIAL FIBER
CABLE LANDING STATIONS & CO-LOCATION FACILITIES
Tang: Tanguisson CLS
Piti-G: Piti (GTA) CLS
Piti-T: Piti (Tata) CLS
DoCoMoP: DoCoMo Pacific Colo
GOREX CONSORTIUM
• University of Hawaii
• University of Guam
• Pacific Wave
• NSRC
• AARNet
WITH SUPPORT FROM THE NSF

GOREX: Guam Open Research & Education eXchange




PIREN: Pacific Islands R&E Network Plans and Opportunities
Japan
Korea
China
Hong Kong
Philippines
Singapore
Indonesia
Australia
New Zealand
CNMI
Guam
Marshall Islands
Yap
Palau
Chuuk
Pohnpei
Papua New Guinea
Solomon Islands
Vanuatu
New Calcedonia
Fiji
Tonga
Tokelau
Samoa
American Samoa
Vava'u
Niue
Cook Islands
French Polynesia
Hawaiian Islands
United States Pacific Wave
USPNet
EXISTING FIBER (R&E)
EXISTING FIBER
PLANNED FIBER
SATELLITE
WITH SUPPORT FROM THE
NSF


PACIFIC WAVE
NATIONAL & INTERNATIONAL PEERING EXCHANGE
Pacific Wave is a project of CENIC & PNWGP
CSTNET
KISTI/KREONET
JGN (Seattle & Tokyo)
TransPAC/Pacific Wave
GEMNet2
WIDE
Korea
Japan
China
Taiwan
Hong Kong
JGN/SingAREN
Singapore
Guam
SINET
SingAREN/Internet2
PIREN
CERNET
AARNET
UH
REANNZ
TWAREN/TANET
Oahu
Hawaii
Australia
REANNZ
New Zealand
PACIFIC WAVE BACKBONE
CANARIE
PNWGP
Vancouver
Seattle
ESnet
DREN
Internet2
CENIC
NREN (NASA Ames)
San Francisco Bay Area
Los Nettos
Los Angeles
Tijuana
FRGP
Denver
UltraLight (Caltech)
Albuquerque
ABQG
El Paso
Transtelco
CUDI
Mexico
Dallas
Houston
Tulsa
Kansas City
StarLight
Chicago
NORDUNet
Nordic Countries
United Kingdom
JANET
SURFnet
GEANT
ESnet
Europe
SPEEDS/POPS
10 Gbps
100 Gbps
CURRENT
FUTURE
Pacific Wave POPs
Pacific Research Platform (PRP)
PRP Science DMZ Fabric
Software Defined Network
Commercial Peering Points
(Amazon, Google, & Microsoft)
WESTERN REGIONAL NETWORK
States served by WRN members:
- ABQG: New Mexico GigaPoP
- CENIC: California
- FRGP: Colorado and Wyoming
- PNWGP: Washington, Montana, Alaska, Oregon & Idaho
- UH: Hawaii
With support from the National Science Foundation
NSF
CEV- 07-2-18-01


Bandwidth Dashboard
Last 24 hours
Refresh every 1d
Gulf of Alaska
Sea of Okhotsk
Mong.
China
N. Kor.
S. Kor.
Canada
United States of America
Mexico
Gulf of Mexico
Labrador Sea
Hudson Bay
NORTH ATLANTIC OCEAN
Mediterranean Sea
Algeria
Nepal
Bhu.
Bngl.
Mya.
Laos
Thai.
Camb.
Bay of Bengal
Taiwan
Philippine
Phil.
Bru.
Malay.
Indon.
E. Timor
Pap. N. Gui.
Sol. Is.
Coral Sea
Fiji
N. Cal.
Australia
N.Z.
Tasman Sea
SOUTH PACIFIC OCEAN
Belize
El. Sal.
C.R.
Caribbean Sea
Col.
Ec.
Peru
Bol.
Chile
Para.
Arg.
Ur.
Falk. Isl.
SOUTH ATLANTIC OCEAN
Ire.
Neth.
Bel.
Ger.
Fr.
Switz.
Italy
Port.
Tun.
Mor.
W. Sah.
Maur.
Mali
Niger
Gam.
Gui.
S.L.
C. Iv.
Benin
Nig.

GOREX GOALS

- **Leverage strategic geographic location of Guam**
- **Establish Open R&E Exchange**
  - Inter-Connect existing, funded, and planned high capacity R&E trans-pacific circuits
- Improve Pacific-wide transport **diversity** and **resilience**
  - Support global R&E networks
  - Facilitate greater access to global R&E networks by Pacific Island nations and communities
- **Overarching Goal:**
  - Promote increased growth and effectiveness of data-intensive and highly collaborative research and education activities engaging the Asia-Pacific region with the global R&E community.

GOREX Status

- **PIREN: GOREX**
  - Juniper MX-480 **installed** at GTA Upper Tumon Co-Lo Facility in Guam (**1.8.18**)
  - SEA-US (100-Gbps) is Connected to GOREX – the first of multiple circuits.
  - Hong Kong connected to GOREX via IN@IU (September 2018)
  - Looking forward to implementing R&E connections from other locations.

- **GOREX Local Hands – Training & Professional Development**
  - We will continue to work with our **NSF CC*** Grant (OAC-1659182) **leadership institutes**, the NSRC and the University of Hawai'i, to continue to improve our technical capabilities to support and develop GOREX.
  - We will continue to participate in Co-Training opportunities with the NSRC:

- **Guam continues to Engage with the Global REN Community**

GOREX Live - Jan 8, 2018

- Juniper MX480
- Cisco 2911 Terminal Server
- SuperMicro PerfSonar @ 40Gbps
- BeagleBone Delay Node

INFORMATION TECHNOLOGY SERVICES

INFORMATION TECHNOLOGY SERVICES

GOREX Colo Location

Planned move

- GTA building new colo space on basketball court
- Adjacent to new Piti CLS
- GOREX will move from Tumon CO to Piti Colo 2019?
- Any circuits coming in should take this into account

INFORMATION TECHNOLOGY SERVICES

For more information regarding GOREX

- http://www.hawaii.edu/piren
- https://gorex.uog.edu
- Email: uognoc@uog.edu

Our Support

- US National Science Foundation (NSF) Awards
  1) OAC-1659182 - CC * Network Design
  2) OIA-1457769 – EPSCoR – Guam Ecosystems Collaboratorium

Our Support – Dave Reese

Q & A