

Department of Defense
STEM Development Office
National Defense Education Program
Pre-Engineering Program

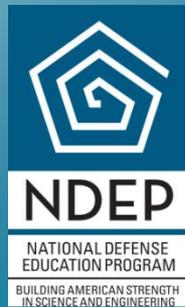
President's Council of Advisors on Science and
Technology (PCAST)

Bob McGahern

Director, NDEP K-12 Programs

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The National Defense Education Program

"So I want to persuade you to spend time in the classroom, talking – and showing - young people what it is that your work can mean, and what it means to you. Encourage your university to participate in programs to allow students to get a degree in scientific fields and a teaching certificate at the same time. Think about new and creative ways to engage young people in science and engineering, like science festivals, robotics competitions, and fairs that encourage young people to create, build, and invent – to be makers of things."

President Barack Obama to NAS and NAE (27 April 2009)

NDEP K-12 Pre-Eng Pgm

Defense Issues

Sufficient Supply of Clearable S&E's

Mission Area Needs

Strengthen National Security Infrastructure

STEM Edu Focus Areas

K-12 Programs

Undergraduate

Graduate

Post-Graduate

Employment

Outreach

Implementers

DDR&E
STEM Development Office

Army

Navy

Air Force

Other DoD

Initiatives

National Defense Education Program
Pre-Eng Pgm

Intel - International Science & Engineering Fair

OUSD (P&R)
DoDEA,
STARBASE

Junior Science & Humanities Symposium

STEM Learning Toolkits

S&E Apprentice Program (SEAP)

DDR&E
Tech Trans

NDEP website,
LabTV, STARLink

AEOP

NNR K-12

La Luz Academy

Professional Development,
Summer Institutes

GEMS

NSAP

Math-Science Odyssey

National Partnerships

e-Cybermission

NRE Interns

UNITE

VA-MD Demo

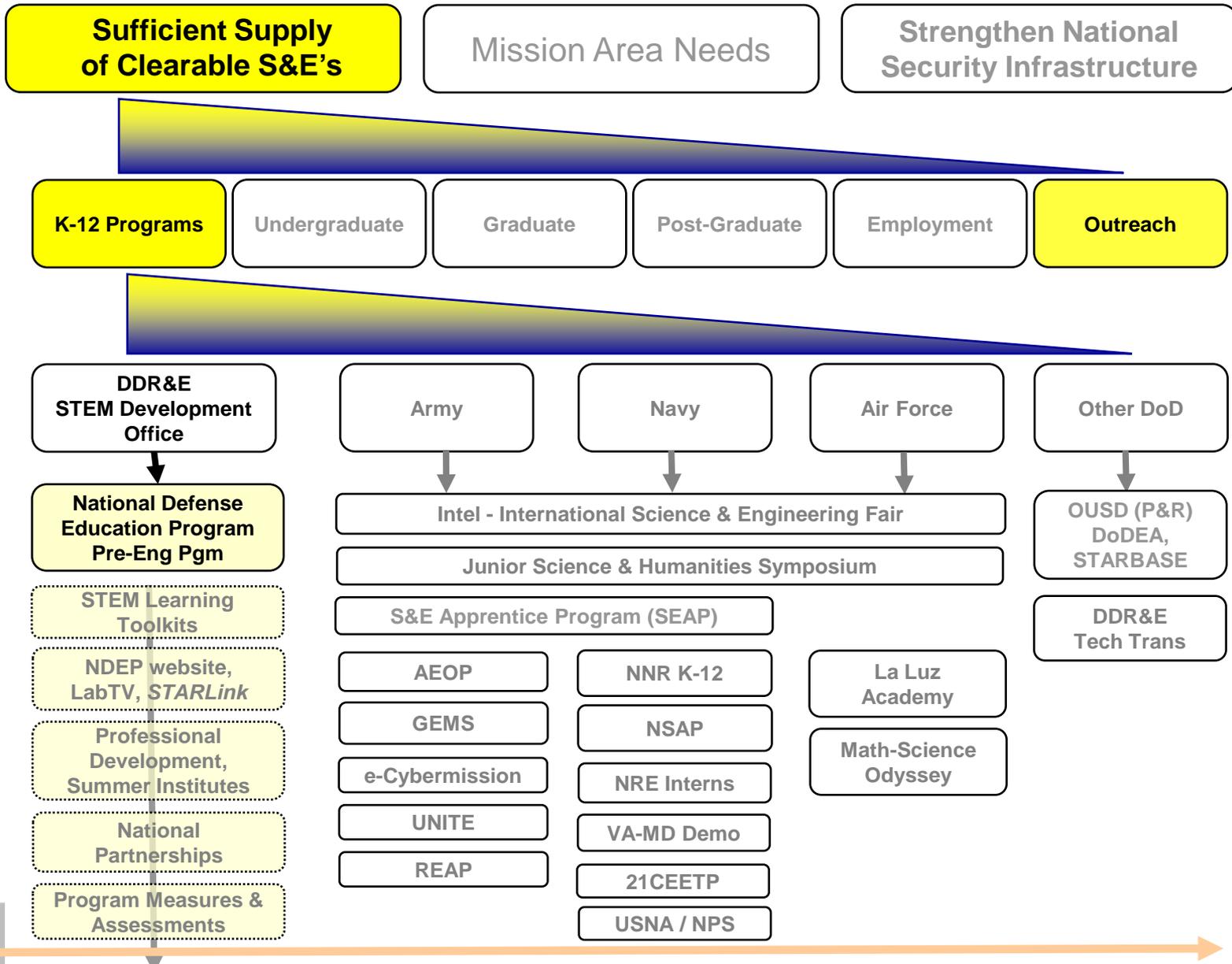
REAP

21CEETP

Program Measures & Assessments

USNA / NPS

NDEP K-12 Integration Catalyst



Why DoD Cares

DoD's Technical Workforce

100,000 DoD S&E's
200,000 Federal S&E's
670,000 DoD employees
2,700,000 Federal employees

Extended DoD Technical Workforce

> 7.4 million

Technical workers at industries, universities
and colleges related to DoD mission areas

Undergraduate and Graduate STEM Students

550,000 U.S. university students studying STEM Fields

Elementary, Middle School and High School Students

Approximately 50,000,000 students

The Department of Defense employs nearly half of all Federal physical scientists, technologists, engineers, and mathematicians

The screenshot shows the NDEP website homepage with a dark navigation bar at the top containing links: HOME, GET INVOLVED, PROGRAMS, PERSONAL STORIES, LAB TV, LABS, COMMUNITIES, FAQs, and ABOUT US. Below the navigation is a blue banner with the NDEP logo and the text "Building American Strength in Science and Engineering".

The main content area is divided into several sections:

- PERSONAL STORIES**: A large image of a smiling woman with a text overlay: "HOT TECHNOLOGY How an Air Force engineer got to specialize in non-lethal heat rays. [READ NOW >](#)". Below this is a "READ MORE PERSONAL STORIES" section with a numbered list of 5 items.
- LAB TV**: A video thumbnail titled "IT'S A BLAST! Teenage Rocket Scientists" with a "WATCH NOW >" link. Below it are links for "Where in the World?", "Beam Me Up", and "Talk To The Hand".
- GET INVOLVED**: A vertical sidebar with three categories: "Scientists & Engineers" (with a microscope icon), "Students" (with a book icon), and "Teachers" (with an apple icon).
- PROGRAMS**: A section titled "The BIG Picture" with a description: "The National Defense Education Program (NDEP) invests in science, engineering and math education from middle and high school through college and post graduation. NDEP's mission is to support a new generation of scientists and engineers who will apply their talents in our nation's defense laboratories. [READ MORE >](#)". It includes a photo of a student using a microscope.
- COMMUNITIES**: A section with a photo of a group of people sitting on bleachers and the text: "NDEP connects educators with science and engineering partners."

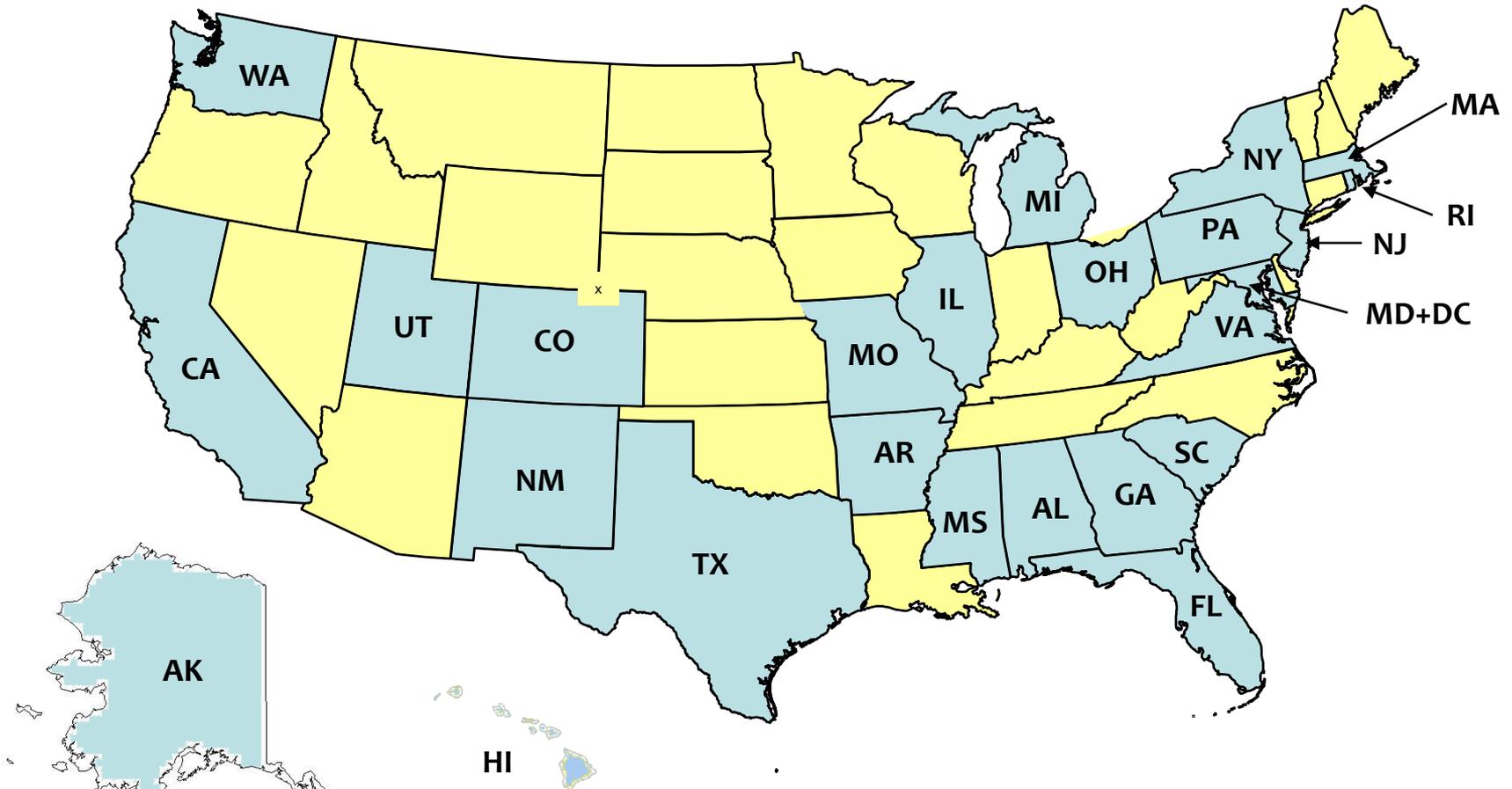
NDEP website = <http://www.ndep.us>

NDEP K-12 Pre-Engineering Program

Pre-Engineering Program

- Local Partnerships
 - Defense STEM professionals collaborate with school professionals
 - Support Teacher – defense S&E professional development training
 - Summer Institute workshops
 - SLM professional development training workshops (in local communities)
- National Partnerships
 - US FIRST Robotics sponsorship (national reach)
 - MATHCOUNTS Club Teams (available to all MS's)
 - Curriculum Development
 - Museum of Science, Boston
- Stimulating STEM interest and inspiring the next generation
 - NDEP website in the classroom
 - LabTV
 - 30 “Season 1”, + 6 “Season 2” so far
 - Diverse pool of DoD employees used; wide range of STEM topics
- Assessment
 - Harford County implementation
 - VA Demo Project impact3
 - Commercial SLM products
- *STARLink* newsletter
 - Wide variety of articles

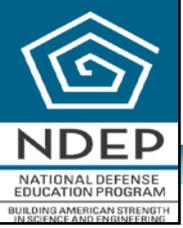
NDEP K-12 Pre-Engineering Program Plans



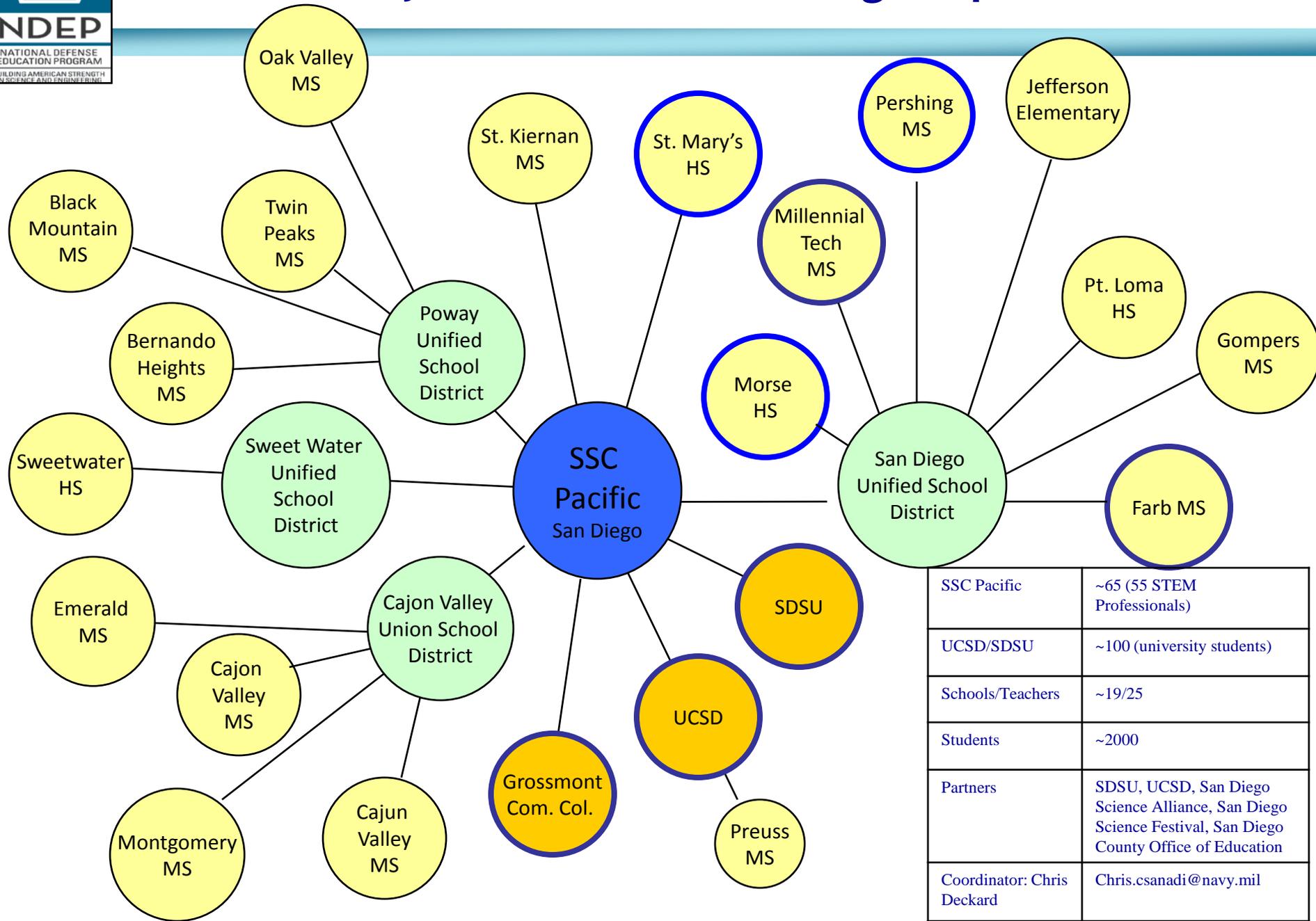
Army locations: AL, AR, IL, MD, MA, MI, MS, MO, NJ

Navy locations: CA, FL, HI, SC, RI, MS, PA, MD, VA, WA

Air Force locations: AK, CO, FL, GA, NM, NY, OH, TX, UT



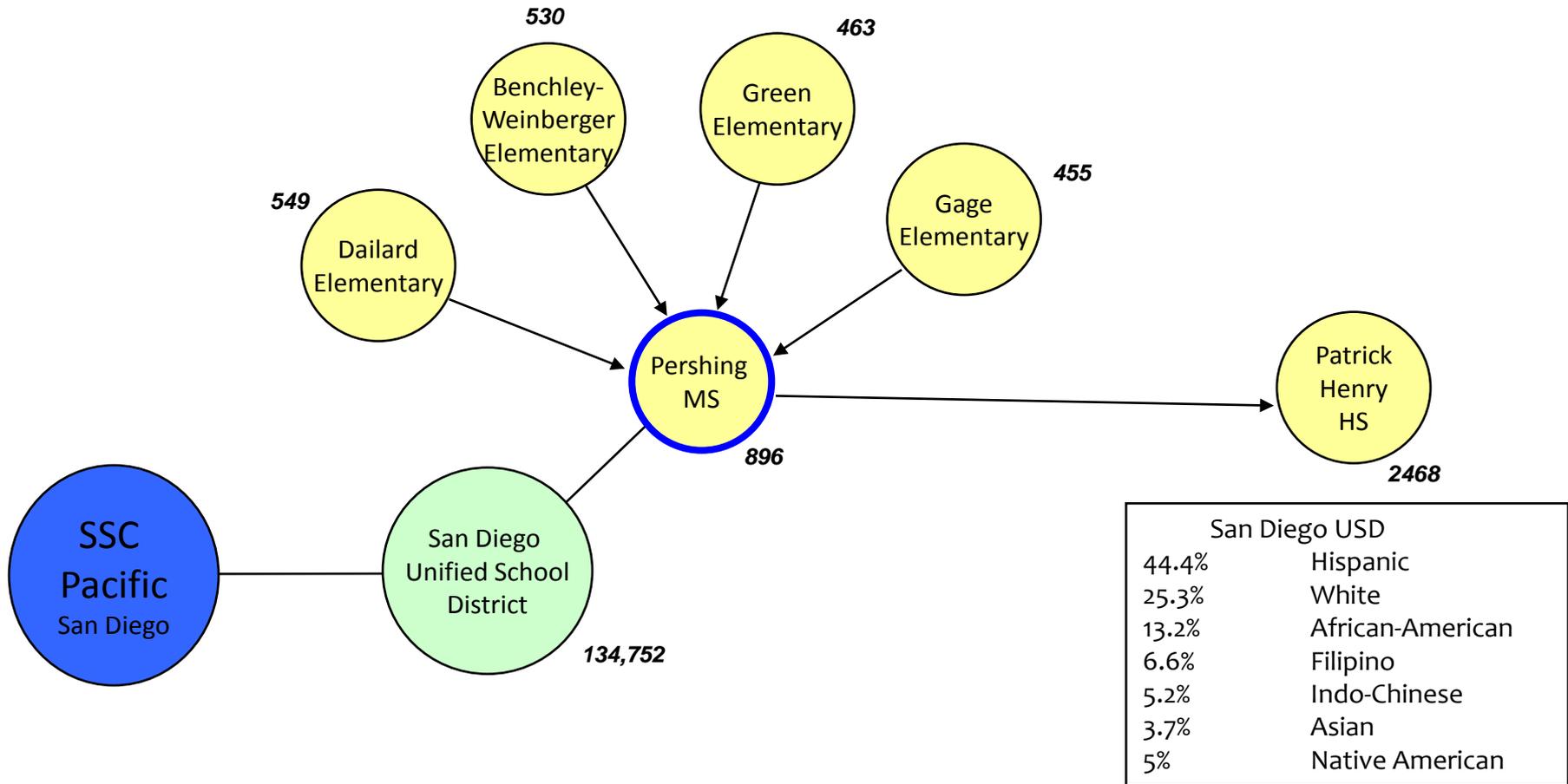
SPAWAR Systems Center -- San Diego Implementation



SSC Pacific	~65 (55 STEM Professionals)
UCSD/SDSU	~100 (university students)
Schools/Teachers	~19/25
Students	~2000
Partners	SDSU, UCSD, San Diego Science Alliance, San Diego Science Festival, San Diego County Office of Education
Coordinator: Chris Deckard	Chris.csanadi@navy.mil

SPAWAR Systems Center -- San Diego

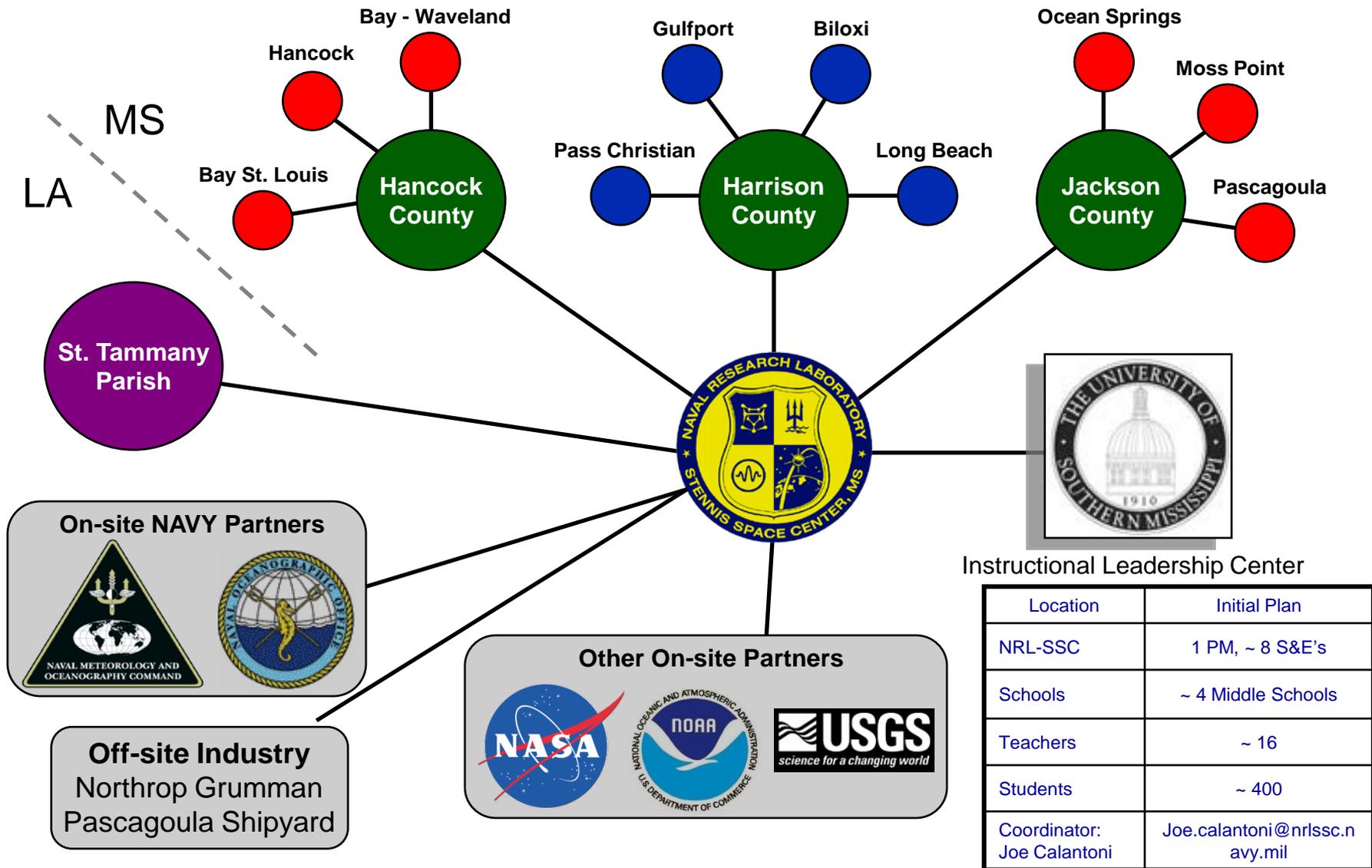
Pershing MS Feedback



"We had remarkable growth last year on our eighth grade state science test, and we are certain that SPAWAR helped us tremendously. Overall we had 13% growth in students meeting standard with strong increases in target groups- 19% growth among Hispanic students, 15% from girls, 17% from economically disadvantaged students and 21% from students learning English."

Pershing MS Principal (8Oct09 e-mail)

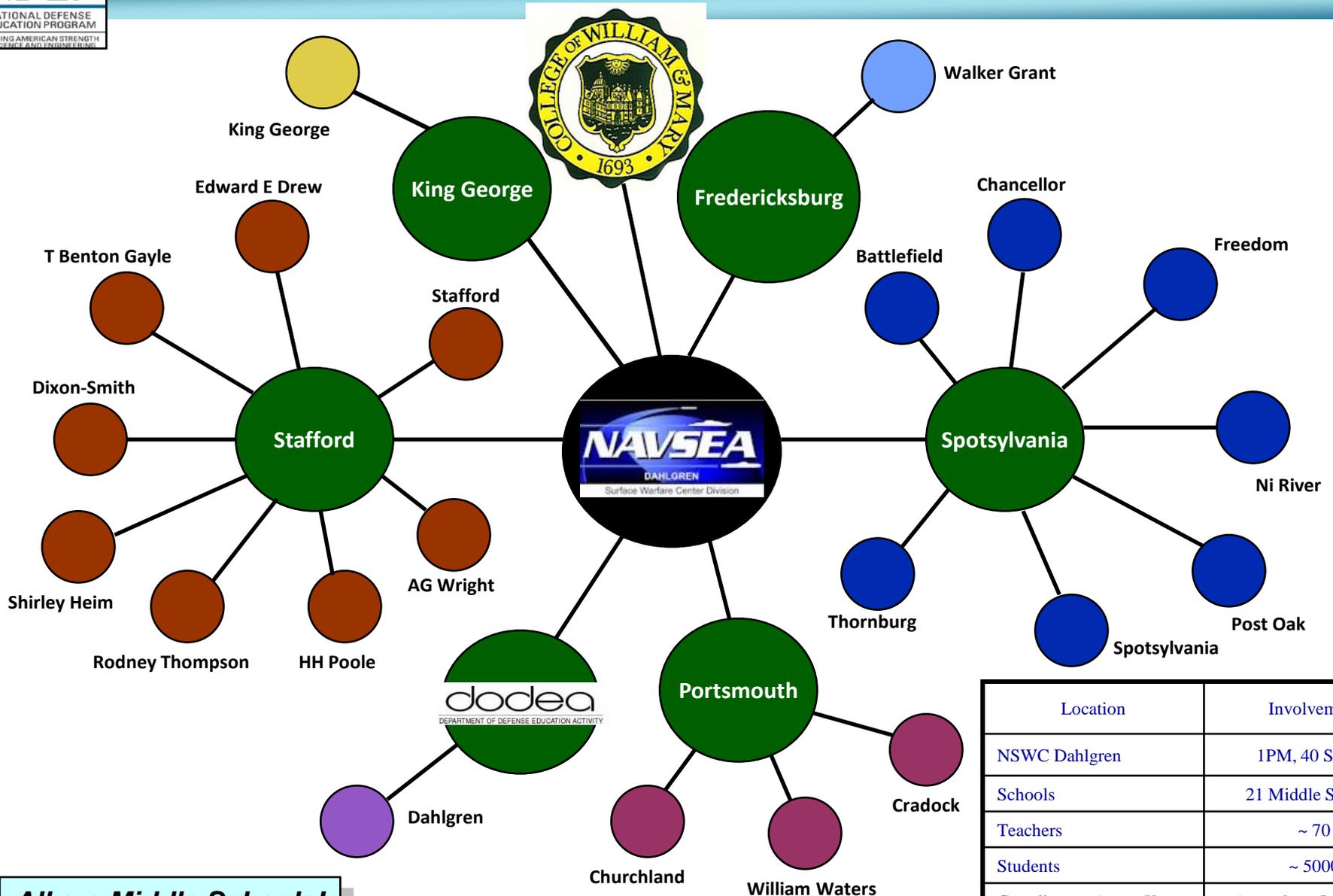
Naval Research Laboratory -- Stennis Space Center, MS (FY10 plans)



Instructional Leadership Center

Location	Initial Plan
NRL-SSC	1 PM, ~ 8 S&E's
Schools	~ 4 Middle Schools
Teachers	~ 16
Students	~ 400
Coordinator: Joe Calantoni	Joe.calantoni@nrlssc.navy.mil

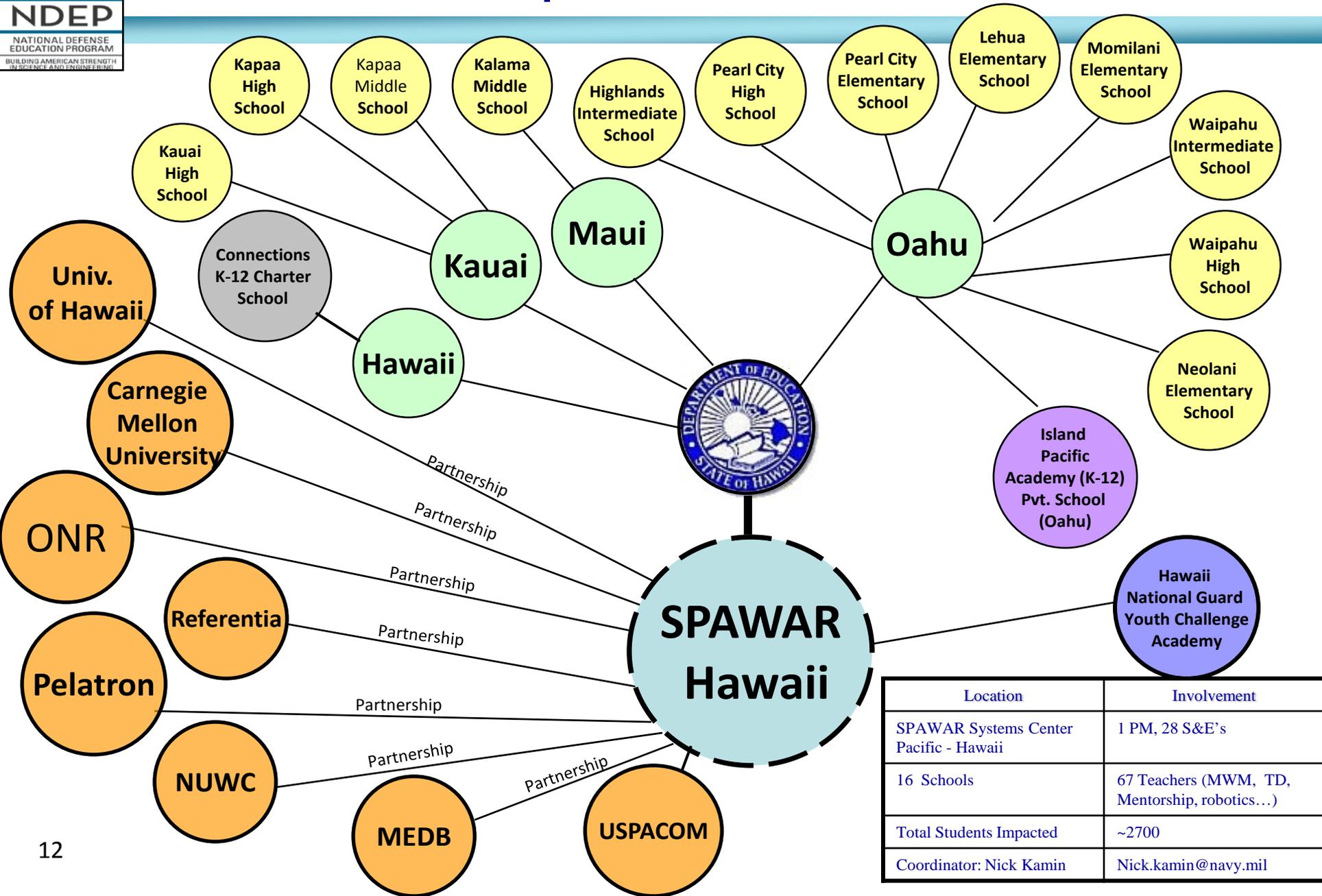
Virginia Implementation (NSWC Dahlgren, VA)



All are Middle Schools!

Location	Involvement
NSWC Dahlgren	1PM, 40 S&E's
Schools	21 Middle Schools
Teachers	~ 70
Students	~ 5000
Coordinator: Aaron Kota	Aaron.kota@navy.mil

Hawaii Implementation *(Started: June 2008)*



Location	Involvement
SPAWAR Systems Center Pacific - Hawaii	1 PM, 28 S&E's
16 Schools	67 Teachers (MWM, TD, Mentorship, robotics...)
Total Students Impacted	~2700
Coordinator: Nick Kamin	Nick.kamin@navy.mil

DoD STEM K-12 Education Issues

No-one Can Do It Alone – Collaboration is key

- Partnering with Schools
 - Providing Useful Support (with limited resources)
 - Grant authority, 501c(3), etc
 - Managing Expectations
 - A continuing opportunity within the DoD
 - More direct and meaningful contact
 - Hands-on and inquiry-centered learning activities
 - Networking students and communities nation-wide
- Partnering with Other Government Agencies
 - Dept Energy, NSF, NASA, NIH, DHS, NOAA, etc
 - Dept Education – Dept Defense MOU
- Partnering with Industry
- Partnering with Professional Societies
- Partnering with Academia
- Partnering with the local community
 - Relevant to local interest, needs, resources, etc
 - Mentoring, STEM professionals as career role models
 - Engagement of parents and family
 - Trying to improve the awareness, perceptions, culture and (hopefully) attitudes towards STEM education and opportunities.

DDR&E STEM Education POC's

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