



# CHL COASTAL & HYDRAULICS LABORATORY

## MISSION:

CHL's mission is to deliver solutions to our Nation's most challenging coastal and hydraulics problems through research, development and application of cutting-edge science, engineering and technology.

## VISION:

The CHL vision is to be a world-class research and development organization that **discovers, develops and delivers** coastal and hydraulics science and engineering to make the world safer and better every day.

We define world-class by three elements:

- ▶ Making substantial contributions to solving difficult problems
- ▶ Being part of an elite cadre of researchers worldwide
- ▶ Continually seeking excellence

## GOALS:

- ▶ **Inspire** a World-Class Workforce
- ▶ **Develop & Deliver** Innovative Solutions
- ▶ **Advance** World-Class Research Facilities
- ▶ **Anticipate & Discover** Transformational Technology
- ▶ **Connect to Strengthen** the Enterprise

## WHAT we do:

CHL's strength is found in our people, who solve problems and initiate scientific discovery through a multi-faceted approach that includes field and laboratory data collection and instrumentation development, physical modeling, computational science and data analytics. The researchers who collaborate on these multi-faceted problems have strengths in our **core competencies**:

- ▶ Hydrology
- ▶ River and Estuarine Engineering
- ▶ Coastal Science and Engineering
- ▶ Fluid Structure Interaction
- ▶ Maritime Operations



## WHY we do it:

CHL works collaboratively across ERDC, the USACE and other government agencies, as well as industry, and academic partners, to deliver world-class products that advance coastal and hydraulics science and

engineering in the **service areas** of:

- ▶ Navigation
- ▶ Flood & Coastal Risk Management
- ▶ Water Management
- ▶ Sediment Management
- ▶ Coastal & Hydraulics Military Engineering

## WHO we are:

CHL, the oldest of ERDC's laboratories, dates back to the late 1920's and provides experimental and computational expertise for solving water resource problems worldwide. Our multi-disciplinary team addresses challenges ranging from groundwater to coastal inlets. More than two-thirds of the laboratory's engineers and scientists hold advanced degrees, which contributes to the production of successful coastal and inland water resources solutions.



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# EL

## ENVIRONMENTAL LABORATORY

### MISSION:

EL's mission is to provide solutions for tomorrow's environmental challenges.

### VISION:

The EL vision is to be a world-class research and development organization that discovers, develops and delivers innovative ways to make the world safer and better every day.

### GOALS:

The Environmental Laboratory provides interdisciplinary technical expertise and a diverse knowledge base about every aspect of the natural environment. We help customers make the right technology choices. Our scientists and engineers are on the leading edge of fundamental and applied research and development that addresses a multitude of biological, chemical and physical phenomena within the natural environment. We give our customers a competitive advantage by delivering the best science-based engineered solutions.

### WHAT we do:

The Environmental Laboratory improves our customers' ability to expand operations in the environment while minimizing impacts. We protect Soldiers from threats in the environment; we expand Soldier training windows that have been constrained by the environment; we find the best concepts for the Nation's infrastructure — delivering the greatest benefits to both the public and the environment. The Environmental Laboratory's research facilities and capabilities are as diverse as our staff, and include chemistry – analytical, computational, soils and geology; genomics and systems biology; ecosystem assessment and restoration; ecotoxicology; remote sensing; geospatial data analysis and modeling; cognitive ecology and animal behavior; contaminated sediment fate, transport and remediation; microbiology for biodegradation; remediation and monitoring; materials science, life-cycle assessments and bio-inspired technology and Multi-Criteria Decision Analysis.



### WHY we do it:

Demand for the Environmental Laboratory's services has dramatically increased over time. The Laboratory was founded in 1978 with the singular purpose of ensuring that the U.S. Army Corps of Engineers could accomplish its mission while complying with the Nation's new environmental protection laws. Today, the Laboratory provides expertise in biological, chemical and physical phenomena in the natural environment to all DOD services, other government agencies and the private sector.

### WHO we are:

EL's interdisciplinary staff of more than 280 engineers, scientists, technicians and support personnel plans and executes all phases of the technology development process, from basic research to field implementation to commercialization. The EL staff consists of problem solvers who use research, development, experimentation, special studies and technical support to address the needs of national and international business development partners. Partnering with federal and state agencies, academia and the private sector, the EL uses its distinctive technical capabilities to resolve complex, multi-disciplinary environmental sustainability problems.



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# I GSL GEOTECHNICAL & STRUCTURES LABORATORY

## MISSION:

GSL's mission is to create innovative solutions to support our Nation's defense, security, public safety and infrastructure.

## VISION:

The GSL vision is to be a world-class research and development organization that **DISCOVERS, DEVELOPS and DELIVERS** solutions to make the world safer and better!

## GOALS:

- ▶ Provide high quality, value-added products on time and on budget
- ▶ Use state-of-the-art engineering and business practices
- ▶ Apply cutting-edge technologies to provide innovation to customers
- ▶ Provide global Warfighter assistance through reach-back engineering technologies
- ▶ Maintain a culture of high-impact tech transfer
- ▶ Connect to strengthen the enterprise



## WHY we do it:

GSL's research team develops innovative solutions to complex geotechnical engineering challenges that address some of the world's toughest Civil Works and Military Engineering challenges. GSL collaborates across the ERDC and the USACE, as well as other government agencies, industry and academic partners to deliver world-class products in the research areas of:

- ▶ Airfields and Pavements
- ▶ Concrete and Materials
- ▶ Geotechnical Engineering and Geosciences
- ▶ Impact and Explosion Effects
- ▶ Mobility Systems
- ▶ Structural Engineering
- ▶ Structural Mechanics
- ▶ Survivability Engineering

## WHO we are:

GSL's primary support to Army S&T includes core competencies of Blast and Weapons Effects on Structures and Geo-Materials, Civil and Military Engineering and Battlespace Terrain Mapping and Characterization.

With more than two-thirds of the laboratory's engineers and scientists holding advanced degrees, our multi-disciplinary team of more than 440 engineers, scientists, technicians and administrative professionals contributes to the production of successful military engineering and civil works solutions.

## WHAT we do:

GSL's strength is found in our people, who solve problems and initiate scientific discovery through a multi-faceted approach that includes field and laboratory data collection and instrumentation development, computational science and data analytics. We use these techniques to develop innovative solutions in the following areas:

- ▶ Force projection and maneuver support
- ▶ Force protection and weapons effects
- ▶ Civil works and infrastructure
- ▶ Operational support and technology transfer

The researchers collaborating on these multi-faceted problems have strengths that directly support five of USACE's Top 10 R&D Priorities:

- ▶ Mitigate and Adapt to Climate Change
- ▶ Win Future Wars
- ▶ Modernize our Nation's Infrastructure
- ▶ Revolutionize and Accelerate Decision Making
- ▶ Improve Cyber and Physical Security



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# INFORMATION TECHNOLOGY LABORATORY

## MISSION:

ITL's mission is to provide innovative solutions to solve the Nation's most complex and challenging information technology and computational issues.

## VISION:

The ITL vision is to be a world-class research and development organization that discovers, develops and delivers solutions to make the world safer and better .

## GOALS:

ITL strives to provide high-quality, value-added products and documentation on time and on budget to customers and stakeholders. Products can typically be classified within three areas:

- ▶ **Advanced information technology hardware solutions** - Collaborative environments, high-performance computing at the tactical edge, augmented reality and virtual reality (AR/VR), digital engineering/ digital twin integration and more
- ▶ **Knowledge universe** – ERDC library initiatives, data lakes for artificial intelligence and machine learning, modeling and simulation wargaming and more
- ▶ **Enterprise software solutions** – Automated information systems, decision analytics tools, physics-based models and more

## WHAT we do:

The Information Technology Laboratory (ITL) is a premier Department of Defense laboratory engaged in the creation and application of advanced information technology in support of the Warfighter and the Nation. ITL conducts research and development in informatics and computational science and engineering with particular emphasis on high-performance computing, computer-aided and interdisciplinary engineering, computer science and instrumentation systems. The laboratory provides unmatched expertise in areas such as:

- ▶ Data science
- ▶ High-performance data analytics
- ▶ Software engineering
- ▶ Systems engineering
- ▶ Augmented and virtual reality
- ▶ Artificial intelligence and machine learning
- ▶ Cybersecurity



## WHY we do it:

As technology continues to advance at a rapid pace, it is critical to stay on the leading edge in order to maintain a competitive advantage. ITL delivers groundbreaking solutions and problem-solving techniques; applies state-of-the-art software development, engineering, security policies and business practices; and utilizes cutting-edge technologies to solve tough problems in an effort ensure mission success for partners across government, industry and academia.

## WHO we are:

ITL is home to nearly 400 dedicated professionals working steadily to execute its program. More than 40% of the workforce holds an advanced degree, and more than 30% has professional certifications or registrations. This team is aided by world-class facilities, including nearly 40,000 square feet of raised floor space that contains both classified and unclassified supercomputing resources. ITL is also home to an innovation laboratory, an augmented reality/virtual reality laboratory, an enhanced cybersecurity service provider facility and a high-performance data analytics center.



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# CRREL

COLD REGIONS  
RESEARCH AND  
ENGINEERING  
LABORATORY

## MISSION:

We deliver environmentally relevant and transformative engineering solutions to test, evaluate and improve infrastructure and equipment, particularly for use in cold regions. We quantify the effects of changing environmental conditions on installations, maneuver and materiel to sustain military and civil operations. We advance our knowledge of ice, snow and terrestrial behavior, mechanics and forces to shape the outcome in achieving mission success.

## VISION:

We're developing innovative solutions for science and engineering challenges in extreme environments.

## GOALS:

At ERDC's Cold Regions Research and Engineering Laboratory (CRREL), our mission is to solve interdisciplinary, strategically important problems impacting Warfighters and the nation in cold and complex regions. Our work centers on developing and delivering transformative technical solutions that meet operational challenges in cold and complex environments.

## What we do:

The Cold Regions Research and Engineering Laboratory (CRREL) is one of the world's premier centers for research in the Earth's cold regions. For more than 60 years, we've helped the U.S. Army Corps of Engineers (USACE), the U.S. Army, the Department of Defense (DoD) and the Nation meet the challenges encountered in some of Earth's harshest and most austere cold region environments. We have a history of success at both the North and South poles, and with our unique cold regions expertise and facilities, we work to ensure the DoD and the Nation are prepared to operate in cold, complex and extreme environments.

- ▶ Biogeochemical sciences
- ▶ Engineering resources
- ▶ Force projection and sustainment
- ▶ Terrestrial and cryospheric sciences
- ▶ Remote sensing and geographical information science (GIS)
- ▶ Signature physics



## WHY we do it:

Through basic and applied research, CRREL ensures USACE, DoD and the Nation are fully prepared and capable of maintaining our national security, addressing operational challenges and civil works interests in cold and extreme environments.

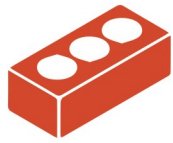
## WHO we are:

Headquartered in Hanover, New Hampshire, and with facilities in Alaska, we're a multidisciplinary team of more than 250 engineers, scientists, technicians and support personnel working together to address current and emerging technical challenges related to cold regions. From our one-of-a-kind permafrost tunnel to our cutting-edge LiDAR research to our ice adhesion testing facility, we're committed to making our nation's operations in cold regions as safe and efficient as possible.



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# CERL CONSTRUCTION ENGINEERING RESEARCH LABORATORY

## MISSION:

CERL's mission is to discover, develop, deliver and sustain innovative technology to support the Army, the Department of Defense, and the Nation.

## VISION:

The CERL vision is to lead in technical knowledge, domain expertise and material solutions to solve challenges that affect our national and military security.

## GOALS:

- ▶ Enrich employee experience, build high-performance teams to win the future fight and maximize mission impact
- ▶ Build a robust, diverse and balanced portfolio while continuing to adapt to changing priorities
- ▶ Create premier research capacity that enables unconstrained response to national customers through collaborative enterprise-wide partnerships
- ▶ Revolutionize innovative solution discovery, development and delivery for greatest product impact
- ▶ Enhance communication practices to provide an informed, transparent and collaborative work culture and environment

## WHAT we do:

CERL's highly interdisciplinary team of world-class engineers, scientists and support staff provide cutting-edge research and development in the primary areas of Infrastructure Science and Engineering (ISE) and Operational Science and Engineering (OSE). ISE's core competencies (Sustainment Management System, Materials & Structures, Energy and Installation Readiness) provide solutions for durable, resilient and sustainable military and civil works facilities. OSE's core competencies (Emergency and Operational Support, Training Lands and Heritage and Warfighter Engineering) deliver integrated solutions for all phases of installation and contingency basing operations and emergency response.



## WHY we do it:

Our commitment to the Army, DoD and the Nation drives our innovation, as well as our research and development. CERL's research products and services enhance the Army's ability to design, build, operate and maintain its installations and contingency bases, as well as to ensure environmental quality at the lowest life-cycle cost. Our world-class facilities support the Army's training, readiness, mobilization and sustainability missions.

## WHO we are:

Since our inception in 1969, we have been affiliated with the University of Illinois Urbana-Champaign and enjoy a flourishing research partnership. CERL has a diverse team of approximately 300 engineers, scientists and technical and support staff. Though our campus is located in Champaign, Illinois, we have employees in 10 states. Our team's interdisciplinary expertise ranges from biology to computer science to engineering to social science (and many more). CERL supports the ERDC Strategic Research and Development Focus Areas of Multi-domain Operations, Civil Works, Smart and Resilient Installations, Robotics and Autonomous Systems and Advance Materials Engineering.



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# GRL

GEOSPATIAL  
RESEARCH  
LABORATORY

## MISSION:

Enabling battlefield dominance by pioneering geospatial solutions for the Warfighter.

## VISION:

Empowering the Warfighter with innovative geospatial solutions.

## GOALS:

The Geospatial Research Lab aims to be a resilient workforce with diverse partners that continuously revolutionize the Geospatial Enterprise through innovative research and development, business practices and community engagement.

## WHAT we do:

Our work centers on geospatial science and engineering. Our research areas include:

- ▶ **Geospatial Data Representation and Analysis** – Concentrates on the exploitation, analysis and display of geospatial information
- ▶ **Geospatial Applications** – Tests and evaluates the collection and processing methods of emerging geospatial systems, platforms and technologies
- ▶ **Geoinformation Generation and Management** – Encompasses research and development technologies for collection and processing of geospatial data, geographic information systems, remote sensing, geospatial intelligence and human terrain data collection and management in support of military and national objectives
- ▶ **Geospatial Data Signature and Analysis** – Applies remote sensing derived geospatial and environmental data collection, processing and display to solve military and national challenges.



## WHY we do it:

The tyranny of terrain has long challenged the most sophisticated engineered systems and military forces. As the world's dominant land domain force, we serve as the dedicated geospatial research and development laboratory, ensuring the Army maintains the geospatial dominance it needs to win. We also support and mature technologies that address national challenges to revolutionize the USACE program.

## WHO we are:

GRL is the only dedicated geospatial research and development laboratory in the Department of Defense. GRL's interdisciplinary staff of more than 80 engineers, scientists and support personnel plan and executes all phases of the technology development process, from basic research to field implementation and commercialization. The GRL staff consists of problem solvers who deliver geospatial solutions that deliver national and international impact.



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