INTRODUCTION

The central naval challenge in the beginning of the 21st century is the problem of guaranteeing access for the projection of power ashore through the littoral; the area close to the enemy's shore - sometimes known as "Brown water" as opposed to the "Blue water" of the open ocean where we planned to do much of our fighting during the cold war.
 Luckily, the Navy has a history of dealing with such challenges.
 Contrary to what some might consider a reputation for a slight bit of stubbornness and reverence for tradition, our Navy is the story of revolutions, from Admiral William S. Sims, who transformed a fleet of wooden sailing vessels into the steel ships that won the naval battles of the second world war, to Admiral Rickover's nuclear navy, to Arleigh Burke.

Each leader revolutionized naval operations and forces to meet a central challenge -- just as we must meet the challenge of access through the enemy's littoral.
 Technology has a critical role here and DARPA pushes the edge of the technological envelope - that's the reason the Director and the Chief of Naval Operations began an effort to identify and develop technology that might radically improve our ability to fight in the littoral....
 The navy is committed to this challenge, no matter where the solution might lead us -- the aperture is wide open.
 Khine and I will talk to you about what this might mean.

THE LITTORAL CHALLENGE

The littoral is a cluttered, dirty environment - ideally suited for asymmetric attacks against our forces.
 It's an area where no-warning attacks by shoulder-fired weapons from fishing craft and suicidal terrorists piloting cigarette boats packed with homemade explosives can hold our sailors and marines at great risk.
 More sophisticated enemies will attempt to deny us access with an array of air defenses, advanced quiet submarines, anti-ship missiles, modern torpedoes and mobile mines.
 It's also inevitable that the unmanned revolution will move to the developing world, allowing opponents to use tactics such as small, slow UAVs laden with explosives.

There are troubled parts of the world where we may need to operate close-in for long periods that are not quite war and not quite peace.
 For all these reasons, the Navy must scrap old cold war "ring of steel" tactics and move to a more offensive posture

And yet, how can we achieve this without increasing the vulnerability of a few, high-value, heavily manned platforms?
 How do we adjust to this new age without being held at risk by enemy forces poised to deny us access?

Let me sketch out a vision of how we might do this by asking a few of those famous DARPA "What if?" questions.

What would it take to physically de-couple sensors and munitions from capital- and crew-intensive ships and aircraft?

If we could do that we could seed the enemy's littoral with the tools to hold him at risk over large areas without placing our sailors unduly at risk - we could move to a much more offensive posture with much greater freedom of action.

What if those sensors were persistent - not for minutes and hours but for days, weeks, and months.
 We could break from a reconnaissance approach to targeting that involves frequent loss and reacquisition of contact to a true surveillance framework - beginning before hostilities and maintained through engagement.
 Not only would our speed of action be radically increased but we could begin to employ powerful techniques to determine patterns, for example - and rapidly bring changes in those patterns to the commander's attention.

What if we could we could quickly fuse information from those sensors in a manner that informs the commander's intuition - that allows him to command instead of hashing through too much data looking for meaning.
 What if I could do that with a radically reduced numbers of Sailors.
 What if the "Control" part of "Command and Control" could be done by the system, responding automatically to the Commander's decisions.

What if the numbers of those sensors and weapons, and other effectors like decoys and deception devices, were so great and in such proximity to the enemy that they become pervasive - the enemy perceives them as everywhere and his destruction of a few has little to no impact.
What if, once I found a target during pre-hostilities, I could deliver a marker that would follow and report on the target until I could neutralize it?
 Even better, What if that marker could find the target itself, and automatically establish track.

 Developing a distributed network based on these offboard, unmanned nodes will allow us to stay on the offense.

 Manned platforms for littoral warfare will be lightly crewed, and coupled with large numbers of smaller, less expensive, unmanned vehicles in larger numbers.
 Most engagements will become remote engagements.
 ------- I'd like to emphasize this point with an example to illustrate the extent of our thinking: in Anti-Submarine Warfare this means no more Sub vs. Sub engagements, no more Ship vs. Sub engagements.

 As an operator, I never run out of demands for better tools - so let me continue with a few more "what-ifs" that feature prominently in our vision for the future:

What if we could make an aircraft carrier stealthy -- not by reducing its signature, but by raising the clutter?
 Decoys have always been useful in warfare, but imagine the effect of not just one decoy, but scores of high-endurance, unmanned, inexpensive, mobile decoys that replicated ship signatures with great fidelity?
 What if we could incorporate them intelligently into the network of sensors and effectors to optimize our probability of rapid engagement.

 Mines are a classic problem in littoral warfare and we've worked on the problem for decades, focusing principally on improving our ability to find them by looking for their shape and working through the problem in linear detect-to-engage fashion: detection, discrimination, classification, and identification.

What if we could do it differently?

What if we could exploit some other characteristic to rapidly locate and
classify mines at much greater range?
 What if we could geo-register the mine with an accuracy approaching one meter
and simply send a neutralization device to that location.
 Better yet, what if I could rapidly neutralize mines without having to locate
them at all.

 All of these capabilities let us rapidly set the stage for the projection of
power ashore - but a complementary approach to the problem would be to change
the nature of our ability to project that power.

What if I could project power ashore from a much greater distance completely via
air and avoid the mines completely.
 This means air vehicles capable of carrying much more weight that are ship
compatible, and inexpensive enough to build in numbers that make a difference.
 It means the ability to deliver rounds hundreds of miles, accurately and with
extremely low latency - before we've completely established air superiority.

THE FUTURE OF NAVAL WARFARE

The implications of these ideas to the future of naval warfare are staggering.
 The power of such an approach goes well beyond anything we can do today but we
are at a point where we can sketch out a vision for the future and have
confidence in its feasibility.
 Now comes the exciting work of making it a reality.

The future is wide open and we can work together to bridge the gap.