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#### Comment 1

Increased access and analysis of peer reviewed publications means that research will be read by more people and used in new ways to create economic growth and improve higher education. Wider and more productive analytical methods mean a much higher return on investment for research publications. Agencies can grow and improve access and analysis markets by instituting rules that require publicly-funded research to be freely available and completely open to use.

More students, entrepreneurs, professors, and developers accessing research means that findings can be used in a wide variety of ways and can be put to use by a wide audience. Restricted access and use of publicly funded content means that public funds are not being used to the best of their abilities, and the return on investment is reduced. Full and open use means that businesses and individuals can build new products and services upon research. This is limited or impossible with the current structure that buries publicly funded research behind expensive pay walls. Open Access also means that research will be available to the general public, making research available to more eyes in a much broader scope than ever before. Open access also fosters interdisciplinary application and greatly increases the value of established research. The impact of open access on a paper's visibility and citation count is well-documented.<sup>1</sup>

By allowing full use of research publications, readers can be much more productive with the information by using new techniques such as data mining and machine reading, and creating a new infrastructure for research. New pathways and connections can be made with open data and citation mapping. Under the current structures, information is locked into silos and users are not able to foster communication between research. Research is only as good as its reach and availability, and the current system is built to hinder access and use. Research can only be used by teachers and students if they have access and the more research that is available to students and teachers, the better and more up to date the education can be. Better education and available research means that American students will be better suited to compete internationally, especially in cutting edge fields like biotechnology and alternative energy, where new research is key to competition. Open data techniques will also enable private companies to capitalize even more on public resources.

Research publications can best be archived by making them immediately accessible and completely open to use in a centralized repository. Faster commercialization spurs economic growth, creating new jobs and advancing American businesses. Companies can also build upon public data and improve services analytical and finding structures, like Google Scholar and goPubMed. By allowing entrepreneurs, scholars, and students to access them without restrictions, the entire data base can be used for data mining or derivative works, and can make the sum greater than the parts.

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<sup>1</sup> JISC Report - [http://www.jisc.ac.uk/fundingopportunities/funding\\_calls/2011/02/benefits.aspx](http://www.jisc.ac.uk/fundingopportunities/funding_calls/2011/02/benefits.aspx); Battelle Report - <http://www.battelle.org/publications/humangenomeproject.pdf>, Celera/HGS - <http://www.nber.org/papers/w16213.pdf>, Houghton Paper - <http://www.cfses.com/documents/wp23.pdf>

It is essential that the most recent research is available to the public. It would not be conducive to innovation and cutting edge research if students, entrepreneurs, and researchers were forced to depend on old research if newer and better research is available. New publicly funded research that is widely available best utilizes public resources and provides immediate benefits to universities and businesses. Open Access has proven to be the most productive dissemination method for research. Open Access increases citations, promotes a diversity of sources within research, increases new research pathways, and makes research immediately available for use in both application and further research.

Once students leave school, they are met with expensive barriers to keep them from research. This greatly hinders their performance in the workplace, as they are unable to keep up with the most recent research in their field. It also hinders entrepreneurs' businesses, leaving them at a disadvantage in the global economy. By making the most recent and advanced publicly funded research available, new businesses stand a much better chance to utilize their skills and compete for a share of the market.

Research can also be best utilized through storage in a centralized repository, similar to the current NIH model. The benefits of an NIH-style access policy are estimated to be approximately eight times larger than the costs, and can be instituted at a relatively small cost. The NIH spends about \$3.5 – 4.6 million annually to provide access to all public-funded research, which is about 1/100<sup>th</sup> of 1 percent of their overall budget. Because of this policy, research is widely accessed and used by a broad population. The NIH database is currently used by more than 500,000 users per day, and the majority of users are outside education, meaning that many of them likely would not have had access to the research in the pay wall model that blocks access to most research outside of the NIH. Full open access is ideal to making all of these ideas come to fruition. Restrictions on use also limit the possible value from research investment. It also means that less money needs to be spent on duplicate research, either through public funding or within the private sector. It's also important that students be taught the most up-to-date information possible to best prepare them for jobs and make them best prepared to compete in the global market.

Comment 2:

Publicly funded research can respect the intellectual rights of researchers and allow for the most complete utilization of research by implementing licenses like Creative Commons's CC-BY license.<sup>2</sup> The NIH currently allows articles to be used under "fair use," which protects authors, though it restricts some of the usefulness of the research. By allowing full use of this research, the public can get the most out of their investment. To further protect scholars' intellectual property; there could be an embargo period, where fair-use is applied, with the research moving to CC-BY or a similar open license. Again, this is not the best way to get productivity out of the research, but it does provide the author more rights over their work.

Comment 3:

The federal government should provide permanent stewardship of research because it ensures that research is permanently preserved, made accessible, and most efficiently usable. By pooling all research together in a centralized location, everything is easily available and searchable in one place, and it's possible to build databases that encourage communication between different research, rather than different collections of research stuck in a number of separate silos, where integration is difficult or

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impossible. Federal stewardship is also very cost-effective, as stewardship for the NIH is only 1/100<sup>th</sup> of one percent of their budget.

At the very least, a federal archive should collect and mirror all publications that are published elsewhere to ensure stability and preservation of the research. However, it's essential that these publications are readily available through the federal repository to ensure that research is stable and constantly available to foster the use of derivative work and accessing tools.

Comment 6:

Uniform requirements and mandates are necessary for consistent creation of publicly-funded research. Because institutions often have researchers who hold grants from multiple agencies, all agencies should establish the same standards to smoothly implement research. Uniformity amongst agencies means lower costs for institutions and an increased rate of compliance. Policies should take advantage of existing protocols to facilitate automatic deposit of manuscripts, and encourage the development of additional tools. Additionally, policies should integrate articles with grants management systems to improve agency accountability and provide information to the public.

Policies to increase tools and other finding methods should work to increase bibliographies and principal investigator profiles to better raise the connectivity of research and raise the profile of those researchers whose works are used and cited the most. These methods would allow universities to better measure research output and impact ratings, and would create better pathways to locate better research and allow universities and libraries to use repositories as teaching tools.

Comment 7:

Educational materials such as book chapters, notes, texts, syllabi, and conference proceedings should also be made readily available to the public, but may require different policies than those directed at journal articles. These types of unpublished works, most notably peer-reviewed conference papers and proceedings, represent a large portion of research and teaching materials that are very relevant to other scholars, as well as the public at large. Feedback from these kinds of papers is integral to the research process, and a wider audience can significantly improve research, as well as keep others informed on current trends and burgeoning research.

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