

SCIENCE DIPLOMACY
CASE STUDY: THE BOSTON INNOVATION ECOSYSTEM

Master of Arts Capstone Project
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Abstract

We can define Science Diplomacy or Techplomacy as the use of scientific, technological and academic collaborations among countries, regions and societies to address common issues and build sound, resilient and transparent international partnerships. Science diplomacy functions as an umbrella that covers numerous kinds of research-based, scientific, academic and engineering exchanges among countries. Science Diplomacy has three different but interconnected dimensions, Science in Diplomacy - how science can inform foreign policy-, Science for Diplomacy - using science to improve international relations - and Diplomacy for Science - how diplomatic activities can facilitate.

Diplomatic and consular hubs nowadays have been assigned the role to support the mobility of researchers (financial aid, visa) and assist them to attract foreign capital for investments. Each government pursues international cooperation by promoting its scientific community on the global stage. By sharing not only costs and risks but also benefits, the nations can build advanced research infrastructures and promote the collaboration of their researchers in multinational programs.

Science Diplomacy has the power to build bridges between science and policy in order nations solve unprecedented problems of today and tomorrow. Efficient collaboration and negotiations led scientists and diplomats to make agreements and establish policies to reduce radiation, decrease the hole in the ozone shield, protect the life on the planet and fight pandemics. Today with the threat of a pandemic closer than ever due to COVID-19, governments need to build global ties and with international collaboration with the scientific guidance and effective diplomacy in order to overcome the crisis. Deploying Science Diplomacy, we can achieve progress with sustainability with international, interdisciplinary and inclusive engagement¹.

The current capstone tries to answer basic questions regarding the integration and deployment of Science Diplomacy focusing on the Boston Innovation Ecosystem. We traced and gathered information that is publicly available on the public domain and formatting objective observations in order to help not only the Greek Diplomatic representation to develop Science Diplomacy practices but also to help every country that currently is deploying or considering to deploy Science Diplomacy in the greater Boston area or in other global city in the world.

¹ Berkman, Paul Arthur, Alexander N. Vylegzhanin, and Oran R. Young. "Governing the Bering Strait region: current status, emerging issues and future options." *Ocean Development & International Law* 47, no. 2 (2016): 186-217.

Introduction

The current research is an initiative of the General Greek Consulate in Boston and the Greek Consul Efstratios (Stratos) Efthimiou. In his attempt to introduce a Science Diplomacy strategy and the Boston Innovation Ecosystem to the Greek Government, Mr Efthimiou encouraged us to conduct a research of the current landscape and trace trends, patterns and processes of the numerous countries that already deploy Science Diplomacy in Boston, using as reference the report “Science Diplomacy: How countries interact with the Boston Innovation ecosystem” by Pavlina Ittelson & Jean-Christophe Mauduit. The current research by using only data and information of the public domain aims to introduce Science Diplomacy to every country that sustain diplomatic representation in the broader Boston area or not. Our research has as a primary goal to be holistic by achieving in the short or long term an international, interdisciplinary and inclusive engagement.

What is Science Diplomacy?

Scientific and technological activities have a tremendous effect on the attempt of building sustainable societies and resolving globally issues, such as global warming and climate change. Diplomacy on the other hand is the governments’ soft power to control and change foreign policies. They can promote common interests contributing to prosperity and peace. By combining science and diplomacy, governments through science diplomacy can form and design international relations where the interests of science and those of foreign policy intersect.

Science and technology give the ability to a country to adopt existing advancements to enhance the productivity of its industries and underlying firms, since S&T constitute crucial drivers of enhancing the competitiveness of both a firm and a country. Governments’ initial aim is to provide an environment that fosters science and technology into a nation’s information and technology infrastructure. Especially, having access and using the information and communication technologies (ICTs) no matter where they have been developed, a nation can boost its economic development and help other nations to follow its steps², since science is knowledge for everyone. Luis Pasteur said that “Science knows no country, because knowledge belongs to humanity, and is the torch which illuminates the world”.

Science has the power to be international and universal by crossing the borders and connecting various people, communities and lately governments. Using this power, diplomacy can build and achieve significant foreign policy objectives such as innovative research, productive communication to solve global issues and facilitate international scientific and technical cooperation by promoting resilience and transparency.³ The combination of science and foreign policy constitutes the science diplomacy, which refers to all practices that researchers’ and diplomats’ actions interact. The concept of science diplomacy is still in early stages, as it gained the attention of the governments just recently. Nations realized the importance to apply scientific

² Porter, Michael. "The comparative advantage of nations." (1990).

³ “Science, technology and Innovation Policy”, unesco.org, <http://www.unesco.org/new/en/natural-sciences/science-technology/science-policy-and-society/science-diplomacy/>, (accessed on May 14, 2020).

expertise to an international effort, aiming to find solutions to international problems through collaborations by balancing economic prosperity, environmental protection and societal wellbeing.⁴ Introducing Science Diplomacy in Ministry of Foreign Affairs (which later can collaborate with a variety of other Ministries of the Government), nations enhance the capacity of the world to balance national interests with common interests.⁵

Science and technology are an integral part of the curriculum of most undergraduate and graduate schools of International Relations. The past has proved numerous times that problem too tremendous to be handled by any individual country creates the foundations and the requirements for international cooperation, therefore expanding even more the focus of the “functionalist model of International Relations”. “It is time that science, technology and international affairs be recognized as an independent sub-discipline, analogous to political economics, which has firmly established its place within the discipline of international relations”. In order to avoid cases of anachronism, “it is of critical importance that the impacts of S&T become part of the mainstream of the teaching, research and practice of international relations”.⁶

What is an Innovation Ecosystem?

Innovation is the introduction of something new. Innovation is often viewed as the application of better solutions that meet new requirements, unarticulated needs, or existing market needs. But according to market experts innovation can be defined by eight different terms⁷ (**Table 1**), but for all of them we need updated information, since it involves decisions. The term Innovation has the ability to be inclusive as it can include all the aspects of humans’ interaction, whether it refers to the business sector or the governments’ soft power. Therefore, the innovation can involve even new governance mechanisms or new infrastructure.

On the other hand, we can perceive the definition of **Ecosystem** by using the term “Hub”. Ecosystem is the broader area that the existing units interact with each other by creating a network, where a balance is mandatory in order the participants to thrive in the current ecosystem. An ecosystem does not have strict boundaries and therefore no one can be excluded. Hubs is the primary element that give access to the involved units to stay connected, informed and active despite how far or close this unit is. We can consider the ecosystem the mean which bridges the international landscape. It gives us the opportunity to approach the questions of our interconnected world in an interdisciplinary way.

⁴ Haynes, Trevor, “Science Diplomacy: Collaboration in a rapidly changing world”, Harvard.edu, <http://sitn.hms.harvard.edu/flash/2018/science-diplomacy-collaboration-rapidly-changing-world/>, (accessed on May 14, 2020).

⁵ Berkman, Paul Arthur. "Evolution of Science Diplomacy and Its Local-Global Applications." *European foreign affairs review* 24, no. 2 (2019): 63-79.

⁶ Weiss, Charles. "How do science and technology affect international affairs?." *Minerva* 53, no. 4 (2015): 411-430, (page 419).

⁷ Skillicorn, Nick, “What is innovation? 15 experts share their innovation definition”, <https://www.ideatovalue.com/inno/nickskillicorn/2016/03/innovation-15-experts-share-innovation-definition/>, (accessed on June 16, 2020).

1.	Having a new idea
2.	Executing the idea
3.	Addressing a real challenge
4.	Adding value to a company
5.	Adding value to the customer
6.	Having a different perspective or thinking
7.	Moving forward
8.	Addressing a new market

Table 1: Definitions of the word "Innovation".

"An Innovation Ecosystem is made up of enabling policies and regulations (governance mechanisms), accessibility of finance, informed human capital, supportive markets, energy, transport and communications infrastructure, a culture supportive of innovation and entrepreneurship, and networking assets, which together support productive relationships between different actors and other parts of the ecosystem"⁸. An Innovation Ecosystem does not have boundaries, since it can operate in multiple levels and everyone can be an inextricable part of it. It does not recognize any geopolitical boundaries, as the Innovation Ecosystem tries to address every sector issues with planetary scale impact, such as climate change, space etc. It consists of various actors, relationships and resources, each one playing significant role with a tremendous impact. The effectiveness of each part within the innovation ecosystem is moderated by other parts of the system (e.g. entrepreneurs depend on being able to access financing). Every actor and action are globally interconnected, therefore even a change to one part of the innovation ecosystem can create a domino effect changes in other parts of the innovation ecosystem.

Without excluding any unit of the Innovation Ecosystem and encouraging even more entities to participate since any Innovation Ecosystem is inclusive, interdisciplinary and international and its purpose welcomes the diversity, the main key actors of an Innovation Ecosystem are displayed in the **Figure 1**⁹. In this group of actors, we have the opportunities to develop and enhance products of synergies and capacities of education, research, financial support and leadership. By being inclusive, the innovation ecosystem has the ability and the power to co-produce knowledge, to co-be productive and contribute to a sustainable, stable and peaceful development of the current Innovation Ecosystem and our world generally. Even when we are talking about the 17 SDGs of the United Nations (**Error! Reference source not found.**), the 17 SDGs agenda talks about a holistic approach to build common interests and balance national interests to address issues and impacts at global-local scale, involving informed decision making¹⁰.

⁸ International Development Innovation Alliance (IDIA), <https://www.idiainnovation.org/ecosystem>, (accessed on June 16, 2020).

⁹ The purpose of each Innovation Ecosystem requests for different perspectives even if these perspectives are undefined initially or not part of an initial characterization. We highlight that even the purpose of the current research is to introduce the concept of Science Diplomacy as it is deployed in the Boston Innovation Ecosystem and urge for universal participation and new ideas.

¹⁰ Young, Oran R., Paul Arthur Berkman, and Alexander N. Vylegzhanin, eds. *Governing Arctic Seas: Regional Lessons from the Bering Strait and Barents Sea: Volume 1*. Springer Nature, 2020, pages 5-25.

Informed Decisionmaking

Berkman et al. 2020 mentioned that informed decisionmaking is “the engine of Science Diplomacy, by helping to achieve sustainability and global relevance onward”. Science Diplomacy introduces options (without advocacy) with holistic approach in order to balance national and common interests for the benefit of all in our globally interconnected civilization. The current research has as a primary goal to identify trends, patterns and processes that will become a baseline for the decisionmaking process for everyone that wants to deploy Science Diplomacy in the globe.



Figure 1: Key Actors of the Innovation Ecosystem¹¹.



Figure 2: The 17 Sustainable Development Goals as they described by the United Nations.¹²

The informed decisionmaking will contribute the Governments to form governance mechanisms (laws, policies, regulatory strategies etc.) and build infrastructure (research, technology investments, institutional assets etc.). **Figure 3** indicates that the first element of the informed decisionmaking is to set questions of common interests. The answers of these questions generate and constitute the data, which involve information, perspectives and agendas of various

¹¹ International Development Innovation Alliance (IDIA), <https://www.idiainnovation.org/ecosystem>, (accessed on June 16, 2020).

¹² <https://www.un.org/sustainabledevelopment/sustainable-development-goals/>.

stakeholders and participants. The combination of the questions and the data will integrate the evidence. Evidence without data will lead to incomplete decisionmaking. The next step is the options, which without advocacy “are tendered with respect for the roles and responsibilities of the decision-makers to produce informed decisions”. **Figure 3** illustrates the Socratic method of questioning and answering to stimulate critical thinking through dialogue¹³.

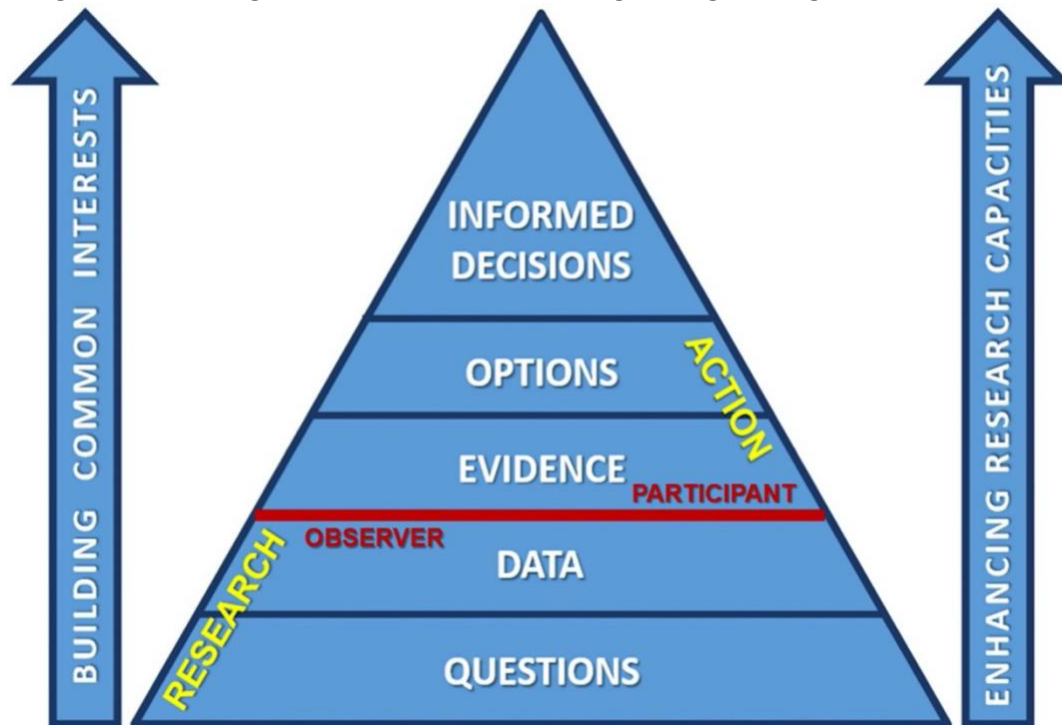


Figure 3: Pyramid of the Informed Decisionmaking (Berkman et al. 2020)¹⁴.

The current research, as we have aforementioned in the previous sections, will form the base for any active or not government referring the deployment of Science Diplomacy in Boston Innovation Ecosystem or anywhere in the world to contribute to the decisionmaking regarding the type of participation, the volume of engagement, the involved actors and the applied policies. In general, it will enhance the governance mechanisms and built infrastructure for the advancement of Science Diplomacy.

Case study: The Boston Innovation Ecosystem

To achieve and maintain prosperity, peace and sustainability across the universe we have to supersede the boundaries imposed by nations and to operate across a spectrum of jurisdiction, beginning from the international, to national and last to subnational, meaning global cities-metropolitan. Cities around the globe are more not only economically but also technologically

¹³ Young, Oran R., Paul Arthur Berkman, and Alexander N. Vylegzhanin, eds. Governing Arctic Seas: Regional Lessons from the Bering Strait and Barents Sea: Volume 1. Springer Nature, 2020.

¹⁴ Berkman, Paul Arthur, Alexander N. Vylegzhanin, Oran R. Young, Informed Decisionmaking for Sustainability, Book Series Preface: Volume 1. Springer Nature, 2020, page xii.

advanced than many nations, having the capacity to integrate and implement local and global sustainable development.¹⁵

The trend is around cities and their markets, abandoning the nation-states and their borders. “Global Cities” or “Megacities” have become powerhouses of economy, political ideas and innovations affecting the international public policy and engaging the local communities. Emerging technologies and global social changes are initially tested at the “Global Cities”. Even the current event of C40’s innovative meeting indicates the leading character that various cities have been designated with in order to provide leadership regarding global issues, such as the reduction of green gas emissions and climate resilience¹⁶. Nowadays, the cities have global capacities superseding the traditional boundaries and borders.

The current diplomatic circles recognizing the importance of the “Global Cities” have deployed networks in order to open diodes of dialogues with the rest of the world through multilateral institutions in order to negotiate, integrate collaborations of intelligence through the researchers and influence foreign audiences. Nowadays, more regularly we hear scientists and diplomats to talk about the 21st century’s Renaissance. Following the example of the first Renaissance, which happened in autonomous cities, such as Florence and Venice, and changed the world as we used to know it, by “redefining the international legal framework and setting the stage for transnational credit” “contemporary global cities are uniquely suited to translate their knowledge, resilience and productivity into global progress”¹⁷.

For our research we studied Boston as an upcoming if not already “Global City”. Switzerland was the first country, which recognized Boston as an upcoming “Megacity”. Except the tremendous world class academic and research institutions (with more than 150k students¹⁸ and 33 academic institutions, residents from more than 100 countries, more than 65 diplomatic representations, topped more than \$5bn foreign investments since early 2015¹⁹), Boston is one of the champions regarding the life sciences, the robotics, the autonomous devices, learning machines and deep technology in general (**Table 2**). Located close to New York, where the world’s biggest and most

¹⁵ Berkman, Paul Arthur. ‘Evolution of Science Diplomacy and Its Local-Global Applications’. European Foreign Affairs Review 24, Special Issue (2019): 63–80.

¹⁶ C40 Events, “The 2019 C40 World Mayors Summit in Copenhagen”, c40.org, <https://www.c40.org/events/the-2019-c40-world-mayors-summit-in-copenhagen>, (accessed on June 17, 2020).

¹⁷ Roig, Alex, “A Science Diplomacy for Barcelona: Global Cities Take the Lead”, medium.com, <https://medium.com/sciencediplomacy/a-science-diplomacy-for-barcelona-global-cities-take-the-lead-c41a4a2a9493>, (accessed on May 28, 2020).

¹⁸ Ranked 11th with the highest percentage of college graduates in the U.S. in 2018, source: US Census Bureau. "Top 50 metropolitan areas with the highest percentage of college graduates in the United States in 2018." Chart. September 26, 2019. Statista. Accessed June 17, 2020. <https://www-statista-com.ezproxy.library.tufts.edu/statistics/432859/us-metro-areas-with-the-highest-percentage-of-college-graduates/>, and numerous of its Universities host the most international students in the U.S., source: Institute of International Education. (November 12, 2019). Universities hosting the most international students in the United States in 2018/19 [Graph]. In Statista. Retrieved June 17, 2020, from <https://www-statista-com.ezproxy.library.tufts.edu/statistics/237695/international-students-in-us-universities/>.

¹⁹ City of Boston, “Boston a Global City”, boston.gov, <https://www.boston.gov/departments/economic-development/boston-global-city>, (accessed on May 28, 2020).

successful incubators and accelerators in innovation start-ups in fintech, foodtech, media etc.²⁰, Boston can provide a marvelous boost to researchers and entrepreneurs with vision in the sustainable development. Ittelson et al. 2019 refers that the renowned universities (Harvard, MIT, Tufts University) “have strong technology transfer offices, and serve as incubators for startups”. As an innovation health hub, Boston have received more \$1bn only in 2019 (**Figure 4**).

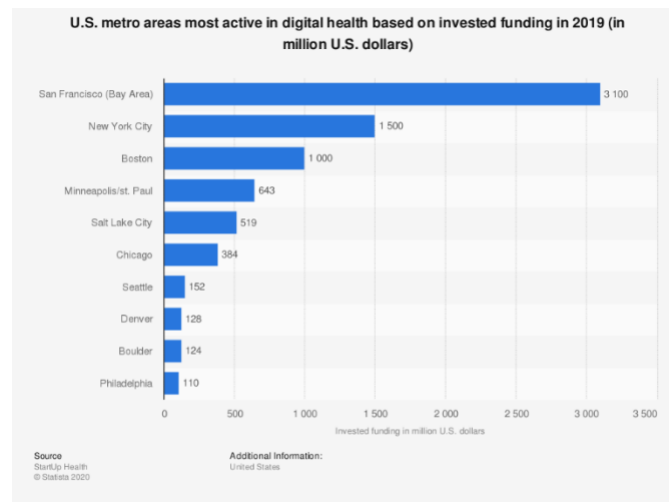


Figure 4: U.S. metro areas most active on digital health based on invested funding in 2019 (in million U.S. dollars)²¹.

In general, the Greater Boston Area is one of the U.S. centers of innovation (**Table 2**) and has one of the three highest in density concentration of U.S. risk capital fund²². Boston is an economic engine due to its higher education, advanced and innovative healthcare, revolutionary high-tech and life sciences, experienced financial advices and services and the abundant mutual funds²³. Boston’s robust economy is demonstrated by its #6 U.S. ranking for metropolitan GDP (Gross Domestic Product) (**Table 2**). In 2018, Boston’s metropolitan area GDP was \$412bn²⁴. This represents enormous economic production for a moderately-sized American city.

²⁰ Oxford Research. Evaluation of the swissnex Network 2020.

²¹ StartUp Health. "U.S. metro areas most active in digital health based on invested funding in 2019 (in million U.S. dollars)." Chart. January 6, 2020. Statista. Accessed June 16, 2020. <https://www-statista-com.ezproxy.library.tufts.edu/statistics/388927/most-active-us-metro-areas-in-digital-health-industry/>.

²² <https://www.mfa.gov.lv/en/usa/embassy-s-news/63348-ambassador-teikmanis-opens-latvian-honorary-consulate-in-massachusetts>.

²³ https://www.bisnow.com/boston/news/state-of-market/why-boston-can-compete-as-a-global-city-64762?utm_source=CopyShare&utm_medium=Browser.

²⁴ BEA. "GDP of the Greater Boston metro area from 2001 to 2018 (in billion chained 2012 U.S. dollars)." Chart. December 12, 2019. Statista. Accessed June 17, 2020. <https://www-statista-com.ezproxy.library.tufts.edu/statistics/183851/gdp-of-the-greater-boston-metro-area/>.

Title of Study	Results	Reference Year
Top Public Traded Companies in Massachusetts ²⁵	Leaders in health, military equipment and energy industry	2019
Number of digital health deal in U.S. based on invested funding ²⁶	45 (ranked 3 rd , after Bay Area & New York City)	2019
U.S. metro areas most active in digital health based on invested funding ²⁷	\$1000m (Ranked 3 rd after Bay Area and New York City)	2019
The Top U.S. Cities for Clean Energy ²⁸	77.50/100 score ("policies for energy and water utilities")	2019
Ranking of U.S. life sciences industry growth potential by cluster ²⁹	89.2% (Ranked 1 st , surpassing Bay Area, Chicago & Seattle)	2018
Leading metropolitan areas in the United States, by number of employed financial analysts ³⁰	12.580 (Ranked 4 th after New York City, Los Angeles & Chicago)	2018
Leading U.S. metropolitan areas, by number of employed financial advisors ³¹	8740 (Ranked 3 rd after New York City and Los Angeles)	2018
Per capita U.S. Real Gross Domestic Product (GDP), by metro area ³²	\$84.682 (Ranked 6 th and 1 st by state ³³)	2018

Table 2: Statistical Data regarding the Greater Boston Area (generated by Statista).

²⁵ Fortune. "Top publicly traded companies in Massachusetts in 2019, ranked by revenue (in billion U.S. dollars)." Chart. May 18, 2020. Statista. Accessed June 17, 2020. <https://www-statista-com.ezproxy.library.tufts.edu/statistics/552003/massachusetts-top-companies-by-revenue/>.

²⁶ StartUp Health. "Number of digital health deals in U.S. metro areas most active based on invested funding in 2019." Chart. January 6, 2020. Statista. Accessed June 17, 2020. <https://www-statista-com.ezproxy.library.tufts.edu/statistics/388947/investment-deal-count-in-most-active-us-metro-areas-in-digital-health/>.

²⁷ StartUp Health. "U.S. metro areas most active in digital health based on invested funding in 2019 (in million U.S. dollars)." Chart. January 6, 2020. Statista. Accessed June 17, 2020. <https://www-statista-com.ezproxy.library.tufts.edu/statistics/388927/most-active-us-metro-areas-in-digital-health-industry/>.

²⁸ McCarthy, Niall. "The Top U.S. Cities For Clean Energy." Digital image. July 30, 2019. Accessed June 17, 2020. <https://www-statista-com.ezproxy.library.tufts.edu/chart/18840/us-cities-with-the-highest-score-for-clean-energy/>.

²⁹ JLL. "Ranking of U.S. life sciences industry growth potential in 2018, by cluster." Chart. September 23, 2019. Statista. Accessed June 17, 2020. <https://www-statista-com.ezproxy.library.tufts.edu/statistics/452180/life-sciences-score-for-new-industry-growth-in-the-us-by-cluster/>.

³⁰ Bureau of Labor Statistics. "Leading metropolitan areas in the United States as of May 2018, by number of employed financial analysts (in 1,000s)." Chart. May 1, 2019. Statista. Accessed June 17, 2020. <https://www-statista-com.ezproxy.library.tufts.edu/statistics/935987/metro-areas-with-the-most-financial-analysts-in-the-us/>.

³¹ Bureau of Labor Statistics. "Leading metropolitan areas in the United States as of May 2018, by number of employed personal financial advisors (in 1,000s)." Chart. May 1, 2019. Statista. Accessed June 17, 2020. <https://www-statista-com.ezproxy.library.tufts.edu/statistics/936003/employment-of-personal-financial-advisors-by-state-usa/>.

³² BEA, und US Department of Commerce. "Per capita Real Gross Domestic Product (GDP) of the United States in 2018, by metropolitan area (in chained 2012 U.S. dollars)." Chart. January 10, 2020. Statista. Accessed June 17, 2020. <https://www-statista-com.ezproxy.library.tufts.edu/statistics/248112/per-capita-us-real-gross-domestic-product-gdp-by-metro-area/>.

³³ BEA. "Per capita Real Gross Domestic Product (GDP) of the United States in 2019, by state (in chained 2012 U.S. dollars)." Chart. April 7, 2020. Statista. Accessed June 17, 2020. <https://www-statista-com.ezproxy.library.tufts.edu/statistics/248063/per-capita-us-real-gross-domestic-product-gdp-by-state/>.

As we have already mentioned at the beginning of our research, we used the Ittelson's et al. 2019 report as a guiding light. At the 2019 report, the writers traced the number of employees in the various industries that are established in the greater Boston area. In order to indicate and validate the resilience of the metropolitan city and the viability of the general Innovation Ecosystem, we continued the research conducted by Ittelson et al. 2019 by tracing the numbers of the jobs for the same industry as it is indicated in **Table 3**. The Boston Innovation Ecosystem not only maintain the numbers but continue to increase with a stable rate across the years 2015-2017.

One further additional element that Boston has is the deployment of the Science & Technology Diplomatic Circles (S&TDC). Its primary mission is to introduce and bring together consulates-governments, international organizations, academia and the private sector for deeper networking and fruitful collaborations. "The motivation was to immerge in the world-class academic and innovation landscape of Boston and create a platform for informal exchanges among the Consulates"³⁴. Its main focus is targeted on Science, Technology and Innovation. In other words, we can consider S&TDC a platform for multilevel interaction in a holistic approach through international, interdisciplinary and inclusive activities, seminars and visits to academic institutions, private owned businesses and governmental offices that shape the Boston Innovation Ecosystem. S&TDC's first coordinated meeting was held in February of 2014 in collaboration with swissnex Boston.

Industry	2015 ³⁵	%	2016 ³⁶	%	2017 ³⁷	%
Health Care & Social Assistance	139,911	18.5	144,957	18.3	148,328	18.3
Professional, Scientific & Technical Services	91,858	12.1	98,933	12.5	101,413	12.5
Finance and Insurance	86,971	11.5	91,323	11.5	94,329	11.6
Government	76,708	10.1	76,940	9.7	75,807	9.3
Accommodation & Food Services	59,910	7.9	62,609	7.9	64,897	8
Educational Services	57,534	7.6	59,414	7.5	57,845	7.1

Table 3: Boston's Total Payroll and non-Payroll Jobs by Industry for the years 2015-2017.

³⁴ Science and Technology Diplomatic Circles, <http://stdc-boston.com/>.

³⁵ Report 2019, "Science Diplomacy: How countries interact with the Boston Innovation ecosystem" by Pavlina Ittelson & Jean-Christophe Mauduit.

³⁶ Boston Planning & Development Agency Research Division, May 2018.

³⁷ Boston Planning & Development Agency Research Division, September 2019.

Our Questions

The current research after the encouragement by the General Greek Consul Efstratios Efthimiou to contribute to the informed decisionmaking for the Greek Government and the Ministry of Foreign Affairs to deploy Science Diplomacy in the Greater Boston Area is designed to address the following questions tracing the publicly available information posted either by the diplomatic representations, any profit or non-profit organization and the S&TDC, contributing to progress with local-global as well as global- local sustainability through the implementation of Science Diplomacy in the Boston Innovation Ecosystem.

- What are the key factors for a successful Innovation Ecosystem?
- How to provide leadership in an Innovation Ecosystem?
- How many diplomatic missions are there in the Boston Innovation Ecosystem?
- How do countries currently interact with the Boston Innovation Ecosystem as it emerged by the collection of the publicly available information?
- How can we characterize the change and the dynamics in the Boston Innovation Ecosystem?
- How can countries contribute to Boston Innovation Ecosystem?
- Are there any gaps in the procedure of Science Diplomacy deployment that can be filled?

Methodology

Boston is a city with one of the highest rates of diplomatic density in the world, having more than 65+ established diplomatic representations in the broader area. Countries, such as Switzerland, realized that the tremendous significance of the high concentration of academic institutions, scientific initiatives and innovative start-ups can build bridges and boost international collaborations in order to balance national and common interests. Therefore, our research comes to answer the question why to choose Boston to deploy Science Diplomacy. We examine what other countries are already doing and which are the fields that they are focusing on. Moreover, we will highlight the achievements of the nations that successfully deploy Science Diplomacy in the Boston Innovation Ecosystem in order to be an example for those who want to follow their example and introduce their countries to Science Diplomacy.

In order to achieve the aforementioned goals, we tried to track and identify the nations with diplomatic representation in the greater Boston area regardless whether they are deploying Science Diplomacy. Our research was limited only in the state of Massachusetts & Rhode Island, since the consular services cover the needs of the broader area of New England (States of Rhode Island, Massachusetts, New Hampshire, Vermont and Maine). By tracking the official websites of the consulates, we identified that the newsfeed and the events of the consulates' websites could form an abundant resource of the way that countries deploy Science Diplomacy in Boston and the main fields that they are focusing on. Therefore, we could identify the main actors of an Innovation Ecosystem, the unique but also common characteristics of Boston Innovation Ecosystem and consequently this research can serve similar researches in the future regarding Science Diplomacy and set a model for any other potential Ecosystems in the world.

Justification of the Methodology

The research was based on a collection of self-reporting of each entity. The collected data are publicly available on the official websites of the diplomatic representations of each country. Moreover, the websites of the profit/non-profit organizations that collaborate with the MFAs in order to deploy the Science Diplomacy in the Boston Innovation Ecosystem are also available to the public. "Public data is information that can be freely used, reused and redistributed by anyone with no existing local, national or international legal restrictions on access or usage"³⁸. Therefore, we focused our research in collecting and displaying only data that can be used, shared and distributed by everyone.

The main purpose of the research is to gather as many information as possible, in order to provide countries, with diplomatic representations in global cities and cities which are characterized as innovation hubs or those that consider to establish new diplomatic offices, a know-how technique to deploy Science Diplomacy in a sub-national level. In other words, how international foreign policies can be formed in a sub-national level, in an innovation hub. The current research has the

³⁸ <https://searchcio.techtarget.com/definition/public-data>.

ability to provide the foundations of any future or similar research of deploying Science Diplomacy in any other existing or potential innovation hub, such as in the Bay Area, Tel Aviv, Bangalore, Zurich etc.

Methodological Approach

Initially, our methodology was focused in tracking the diplomatic presence in the greater Boston area by using only publicly available data on the Internet. The tracking of the contact information of the diplomatic representations was implemented either by the official websites of the Ministry of Affairs (MFA) of each country or by the use of official online databases such as consulate-boston.com³⁹, consulate-info.com⁴⁰ & embassypages.com⁴¹. Assessing the official websites, we identified the location, the type, the available website languages of the consulates and whether they already deploy Science Diplomacy or not in the broader Boston area. The development of practices regarding the Science Diplomacy was indicated by either integrating a distinct section on their websites, or the presence of a Science Attaché or collaborating with profit/ non-profit organizations, whose role is to build bridges for collaborations on various subjects of science, technology and innovation. In order to track these organizations, we used as reference the Ittelson's et. al. 2019 report "How countries can interact with Boston Innovation Ecosystem"⁴².

Afterward, we dove into the news and the events organized by the consulates regarding the advocacy of Science Diplomacy. Therefore, we searched for seminars, webinars (common especially during the pandemic period of COVID-19), networking events, organized meetings with incubators/accelerators, visits to universities and companies or even visits of start-ups from the home countries to Boston. The research was limited till the year of 2014 despite the fact that there are countries with scientific diplomatic presence in Boston since 2000 (e.g. Switzerland).

However, despite the fact that at the beginning our research was limited to the events organized only by the consulates of the various countries, we expanded it by researching the newsfeed of the profit and non-profit organizations that MFAs collaborate with. By searching the web and having as a leading point the Ittelson's et. al. 2019 report, we related the countries with the organizations and followed the same pattern as previously in order to track and identify trends, patterns and processes developing Science Diplomacy in Boston Innovation Ecosystem.

Last but not least, the official website of Science & Technology Diplomatic Circle (S&TDC) was also a valuable source for our research. However, we have to mention that at the beginning the tracking of the official website was impossible as it seemed to be "down". Therefore, we reached out to the co-chair of S&TDC, Patricia Gruver, who provided us with the new link of the website and with a list of the events from 2014-2017. The list included the dates, the description of the events and

³⁹ <https://www.consulate-boston.com/index.php>.

⁴⁰ <https://www.consulate-info.com>.

⁴¹ <https://www.embassypages.com>.

⁴² Ittelson Pavlina, Mauduit Jean-Christophe "How countries can interact with Boston Innovation Ecosystem", published by DiploFoundation 2019

the participants. The provided data contributed to make conclusions regarding the type of the events that the various countries prefer, hence on the other hand to recognize countries that despite the fact that they don't have any diplomatic representation in the greater Boston area they have scientific diplomatic presence in its ecosystem, such as Australia, China & Malaysia.

Structuring our Data

Error! Reference source not found. lists the diplomatic representation of the various nations in the greater Boston area. At that table we also indicate the type of the diplomatic presence (Consulate/Honorary Consulate/Government Office). **Table 6** contains the nations that despite the lack of diplomatic representation in the Boston area they keep an active role of participation of the events organized by S&TDC.

By collecting all the contact information of the diplomatic representations in the greater Boston area and the information regarding the deployment of Science Diplomacy in the Boston Innovation Ecosystem, we created an index, where everyone interested in the Science Diplomacy and the diplomatic representations can find the basic information of the 67 countries with presence in the greater Boston area and their practices. The table for each country has the same format and includes the contact information of each diplomatic presence (type of consulate, address, phone number and neighborhood) and the various forms of Science Diplomacy (presence of Science Diplomacy section in the Consulate, Science Attaché (which we obtained from the General Greek Consulate in Boston) a potential collaboration with any other Government office or with a profit/non-profit organization) they deploy in the Boston Innovation Ecosystem. We included additionally some personal notes as they came from the interpretation of the gathered information, such as the practices of Science Diplomacy, main focus and participation at events organized by the S&TDC.

As we aforementioned S&TDC was a valuable source for our research. We organized the given data and extracted them into figures. We identified the countries that participated in the various events that S&TDC organized, which were color-coded as following:

- University Visits: Green
- Discussion of Administration Issues: Blue
- Company Visits: Orange
- Networking Events: Grey
- Events organized in collaboration with more than 1 country: Yellow.

Moreover, we organized all the information of the events that were contacted by each country separately. By using the same color-coding approach by adding the following categories:

- Venture Capital (Accelerators/Incubators): Red
- Introducing New Technologies: Purple
- Introducing the US Market: Pink
- Promote Investments – Research position in home country: Brown,

we identified a broader cover of type of events, which not only can justify the main focus of each country, as it was captured by the report “How countries can interact with the Boston Innovation Ecosystem” (**Table 5**), but also enriched the primary goals of each nations, which can provide us with a better view of the added value of integrating Science Diplomacy in Boston. The various topics that are covered during the events and the frequency can build a profile for each country regarding the means that they use to apply Science Diplomacy. The most impressing though was how quickly the nations could adapt their techniques during the pandemic (COVID-19) and organized multiple webinars engaging the global scientific community.

Weaknesses of our Methodology

However, the disadvantage of using publicly available information is that there are cases that the data can be limited. For our research, especially for the case of tracking the news and events organized by the countries were very scarce. The limited available data can easily lead us to rushed conclusions and assumptions. Moreover, since we were searching only on official websites, unavailable links and websites that were “down” were a common phenomenon, such as the official domain of Science & Technology Diplomatic Circles was “down” and constrained the access and availability of the events, collaborations and participants-diplomatic representations. Therefore, the research is not exhaustive but extensive enough to form well-constructed conclusions.

Lastly, the language was one more weakness of the used methodology. Even though the diplomatic representation is in US city, some websites do not use a second language (e.g. English) except the widely spoken language in home country (e.g. Mexican consulate website uses only the Spanish language). The language can be a constraining factor as the interested audience may find difficulties to get access to information or events that can help them to advance, develop and deploy Science Diplomacy in any innovation hub in general, and for Boston specifically for the current case study.

Results

The interpretation of our research led us to create an index, which would include the 67 countries that preserve a diplomatic presence in the broader Boston area. A table is submitted at the next page, indicating the countries with diplomatic missions in the greater Boston area in an alphabetical order, hence the country details by continents will follow at the next pages. We can consider this index as the answer to our question of **“How do countries currently interact with the Boston Innovation Ecosystem as it emerged by the collection of the publicly available information?”**. The countries are listed by the six different continents in an alphabetic order. In each table, we have included the basic contact information, such as the type of the diplomatic presence, the address and the phone number etc., and whether the country is deploying Science Diplomacy in the Boston Innovation Ecosystem. We are referring to the deployment and presence of a Science Attaché in the countries of the table, which was concluded by the list of available science attaches provided by the General Greek Consulate of Boston.

We highlight whether the official MFA websites are provided with a tab/section exclusively for Science Diplomacy services. We distinguish the countries that Science Diplomacy representation of a country is deployed by a governmental office, such as the Ministry of Foreign Affairs, Economic Affairs, Science & Technology etc., in other words, Science Diplomacy is developed under governmental jurisdiction. On the other hand, we mention whether the Science Diplomacy representation of a country is deployed in collaboration with either profit or non-profit organizations in order to build scientific, technological & innovation bridges with the Boston Innovation ecosystem and home country. In the case of the abbreviation “N/A”, we mean that the specific characteristic is “not applicable” for this country.

A/A	Nations	Type of Consulate	A/A	Nations	Type of Consulate
1	Albania	Honorary Consulate	35	Lebanon	Honorary Consulate
2	Austria	Honorary Consulate	36	Liechtenstein	Honorary Consulate
3	Belgium	Honorary Consulate	37	Lithuania	Honorary Consulate
4	Bolivia	Honorary Consulate	38	Luxembourg	Honorary Consulate
5	Brazil	Consulate	39	Malta	Honorary Consulate
6	Bulgaria	Honorary Consulate	40	Mexico	Consulate
7	Cambodia	Honorary Consulate	41	Monaco	Honorary Consulate
8	Canada	Consulate	42	Morocco	Honorary Consulate
9	Cape Verde	Consulate	43	Nepal	Honorary Consulate
10	Chile	Honorary Consulate	44	Netherlands	Honorary Consulate
11	Colombia	Consulate	45	New Zealand	Honorary Consulate
12	Cyprus	Honorary Consulate	46	Nicaragua	Honorary Consulate
13	Czech Republic	Honorary Consulate	47	Norway	Honorary Consulate
14	Denmark	Honorary Consulate	48	Pakistan	Honorary Consulate
15	Dominican Republic	Consulate	49	Peru	Consulate
16	Ecuador	Honorary Consulate	50	Poland	Honorary Consulate
17	Egypt	Honorary Consulate	51	Portugal	Consulate
18	El Salvador	Consulate	52	Quebec	Government Office
19	Estonia	Honorary Consulate	53	Romania	Honorary Consulate
20	Finland	Honorary Consulate	54	Rwanda	Honorary Consulate
21	France	Consulate	55	Senegal	Honorary Consulate
22	Georgia	Honorary Consulate	56	Slovak Republic	Honorary Consulate
23	Germany	Consulate	57	South Korea	Consulate
24	Greece	Consulate	58	Spain	Consulate
25	Guatemala	Honorary Consulate	59	Sri Lanka	Honorary Consulate
26	Haiti	Consulate	60	Sweden	Honorary Consulate
27	Hungary	Honorary Consulate	61	Switzerland	Consulate
28	Iceland	Honorary Consulate	62	Taiwan ⁴³	Government Office
29	Ireland	Consulate	63	Thailand	Honorary Consulate
30	Israel	Consulate	64	Turkey	Consulate
31	Italy	Consulate	65	UAE	Consulate
32	Jamaica	Honorary Consulate	66	UK	Consulate
33	Japan	Consulate	67	Venezuela	Consulate
34	Latvia	Honorary Consulate			

Table 4: Nations with Diplomatic Presence in the greater Boston area.

⁴³ Taiwan does not have diplomatic relations with the U.S.

Africa

Cape Verde

Country	Cape Verde
Type of Diplomatic Presence	Consulate
Address	300 Congress St.
Postal Code	02169
District	Quincy, MA
Phone Number	(617) 353-0014
Email	N/A
Website	N/A
Language	N/A
Science Diplomacy Presence	No
Science Attaché	No
Website Science Innovation	N/A
Government Science Representation	N/A
Profit / Non-profit Science Representation	N/A
S&TDC member	N/A
Notes Cape Verde is a country that currently does not deploy any kind of form of Science Diplomacy in the greater Boston area. Therefore, any information regarding the Science Diplomacy is unavailable for now, since even the contact information is incomplete.	

Morocco

Country	Morocco
Type of Diplomatic Presence	Honorary Consulate
Address	N/A
Postal Code	N/A
District	N/A
Phone Number	N/A
Email	moroccanconsulboston@gmail.com
Website	https://moroccanconsulateboston.com
Language	English
Science Diplomacy Presence	No
Science Attaché	N/A
Website Science Innovation	N/A
Government Science Representation	N/A
Profit / Non-profit Science Representation	N/A
S&TDC member	No
Notes Morocco is a country that currently does not deploy any kind of form of Science Diplomacy in the greater Boston area. Therefore, any information regarding the Science Diplomacy is unavailable for now, since even the contact information is incomplete.	

Rwanda

Country	Rwanda
Type of Diplomatic Presence	Honorary Consulate
Address	151 Tremont St.
Postal Code	02111
District	Boston, MA
Phone Number	(617) 948-9449
Email	N/A
Website	<u>N/A</u>
Language	N/A
Science Diplomacy Presence	No
Science Attaché	<u>N/A</u>
Website Science Innovation	<u>N/A</u>
Government Science Representation	<u>N/A</u>
Profit / Non-profit Science Representation	<u>N/A</u>
S&TDC member	No
Notes Rwanda is a country that currently does not deploy any kind of form of Science Diplomacy in the greater Boston area. Therefore, any information regarding the Science Diplomacy is unavailable for now, since even the contact information is incomplete.	

Senegal

Country	Senegal
Type of Diplomatic Presence	Honorary Consulate
Address	285 Carpenter St.
Postal Code	02909
District	Providence, RI
Phone Number	(617) 948-9449
Email	<u>N/A</u>
Website	<u>N/A</u>
Language	N/A
Science Diplomacy Presence	No
Science Attaché	<u>N/A</u>
Website Science Innovation	<u>N/A</u>
Government Science Representation	<u>N/A</u>
Profit / Non-profit Science Representation	<u>N/A</u>
S&TDC member	No
Notes Senegal is a country that currently does not deploy any kind of form of Science Diplomacy in the greater Boston area. Therefore, any information regarding the Science Diplomacy is unavailable for now, since even the contact information is incomplete.	

Asia

Cambodia

Country	Cambodia
Type of Diplomatic Presence	Honorary Consulate
Address	16 Pine St.
Postal Code	01851
District	Lowell, MA
Phone Number	(978) 735-4539
Email	cambodian.hcg.lowell@gmail.com
Website	https://cambodianconsular.wordpress.com
Language	English
Science Diplomacy Presence	No
Science Attaché	<u>N/A</u>
Website Science Innovation	<u>N/A</u>
Government Science Representation	<u>N/A</u>
Profit / Non-profit Science Representation	<u>N/A</u>
S&TDC member	No
Notes Cambodia is a country that currently does not deploy any kind of form of Science Diplomacy in the greater Boston area. Therefore, any information regarding the Science Diplomacy is unavailable for now, since even the contact information is incomplete.	

Georgia

Country	Georgia
Type of Diplomatic Presence	Honorary Consulate
Address	50 Milk St.
Postal Code	02109
District	Boston, MA
Phone Number	(719) 351-9752
Email	jguthrie@mfa.gov.ge
Website	N/A
Language	N/A
Science Diplomacy Presence	No
Science Attaché	<u>N/A</u>
Website Science Innovation	<u>N/A</u>
Government Science Representation	<u>N/A</u>
Profit / Non-profit Science Representation	<u>N/A</u>
S&TDC member	No
Notes Georgia is a country that currently does not deploy any kind of form of Science Diplomacy in the greater Boston area. Therefore, any information regarding the Science Diplomacy is unavailable for now, since even the contact information is incomplete.	

Japan

Country	Japan
Type of Diplomatic Presence	Consulate
Address	600 Atlantic Ave
Postal Code	02110
District	Boston, MA
Phone Number	(617) 973-9772
Email	N/A
Website	https://www.boston.us.emb-japan.go.jp/itprtop_en/index.html
Language	English, Japanese
Science Diplomacy Presence	Yes
Science Attaché	Yes
Website Science Innovation	Yes
Government Science Representation	No
Profit / Non-profit Science Representation	No
S&TDC member	Yes
Notes The option of using the website in the English version in order to be accessible to the broader audience (international) and inclusive indicates the holistic approach of the Japanese Government. Japan is present in the Boston Innovation Ecosystem since 2014 (early participation in the S&TDC events). The Consulate General of Japan is staffed with a Science Attaché and the fact that Science Diplomacy is an inextricable part of the Japanese Foreign Policy is that the official website of the Consulate in Boston is equipped with a separate tab dedicated specifically to Science Diplomacy and it can be found under the name “Science & Technology”⁴⁴. Our research in the newsfeed of the official website of the Consulate indicated that the Japanese Government has adopted a very active role in the greater Boston area, organizing multiple types of events, such as university and company visits, promotion of the home country research and business market. Moreover, the Japanese Science diplomatic presence is intense, since Japan belongs to the group of countries with high participation to the events that are organized by the S&TDC.	

⁴⁴ https://www.boston.us.emb-japan.go.jp/itpr_en/scienceandtechnology.html

Nepal

Country	Nepal
Type of Diplomatic Presence	Honorary Consulate
Address	151 Tremont St.
Postal Code	02111
District	Boston, MA
Phone Number	(617) 948-9449
Email	N/A
Website	N/A
Language	N/A
Science Diplomacy Presence	No
Science Attaché	<u>N/A</u>
Website Science Innovation	<u>N/A</u>
Government Science Representation	<u>N/A</u>
Profit / Non-profit Science Representation	<u>N/A</u>
S&TDC member	No
Notes Nepal is a country that currently does not deploy any kind of form of Science Diplomacy in the greater Boston area. Therefore, any information regarding the Science Diplomacy is unavailable for now, since even the contact information is incomplete.	

South Korea

Country	South Korea
Type of Diplomatic Presence	Consulate
Address	300 Washington Street (One Gateway Center)
Postal Code	02458
District	Newton, MA
Phone Number	(617) 641-2830
Email	kcgboston@mofa.go.kr
Website	http://overseas.mofa.go.kr/us-boston-en/index.do
Language	English, Korean
Science Diplomacy Presence	Yes
Science Attaché	Yes
Website Science Innovation	No
Government Science Representation	N/A
Profit / Non-profit Science Representation	N/A
S&TDC member	Yes
Notes South Korea is present in the Boston Innovation Ecosystem since 2014 (early participation in the S&TDC events). The Consulate General of South Korea is staffed with Science Attaché. The Consulate has organized numerous events, such as networking events, collaborations in biotech, exchange of information on their own projects and current situation and sought for the way to improve reciprocal cooperation, Robot Enterprise Promotion Association etc., (source: news-events of the official website of the South Korean Consulate). Our research in the newsfeed of the official website of the Consulate indicated that the S. Korean Government has adopted a very active role in the greater Boston area, organizing multiple types of events, such as university and company visits, building strong networks and collaboration, promotion of the home country and the Boston research and business market. Moreover, the S. Korean Science diplomatic presence is intense, since S. Korea belongs to the group of countries with high participation to the events that are organized by the S&TDC.	

Sri Lanka

Country	Sri Lanka
Type of Diplomatic Presence	Honorary Consulate
Address	77 Rowe St.
Postal Code	02466
District	Auburndale, MA
Phone Number	(617) 213-8370
Email	N/A
Website	N/A
Language	N/A
Science Diplomacy Presence	No
Science Attaché	<u>N/A</u>
Website Science Innovation	<u>N/A</u>
Government Science Representation	<u>N/A</u>
Profit / Non-profit Science Representation	<u>N/A</u>
S&TDC member	No
Notes Sri Lanka is a country that currently does not deploy any kind of form of Science Diplomacy in the greater Boston area. Therefore, any information regarding the Science Diplomacy is unavailable for now, since even the contact information is incomplete.	

Taiwan

Country	Taiwan
Type of Diplomatic Presence	Government Office
Address	99 Summer St.
Postal Code	02110
District	Boston, MA
Phone Number	(617) 737-2050
Email	N/A – Inquiry Form
Website	https://www.taiwanembassy.org/usbos/
Language	English, Chinese
Science Diplomacy Presence	Yes
Science Attaché	No
Website Science Innovation	Yes
Government Science Representation	Ministry of Science and Technology & TECRO Boston Taiwanese Biotechnology Association (BTBA)
Profit / Non-profit Science Representation	No
S&TDC member	Yes
Notes The Taiwanese government office in Boston has organized numerous events, such as various collaborations among the Boston Innovation Ecosystem, networking events, building bridges with entrepreneurs and accelerators and bringing together various diplomatic representations of other countries (inclusive). However, the language of the website (partially Chinese) makes the newsfeed partially inaccessible and incomprehensible. The main focus of the Taiwanese diplomatic representation is to: • Help students due to exchange programs with US universities • Engage diaspora to guide the policymakers of the home government for socio-economic development Our research in the newsfeed of the official website of the Taiwanese Government Representation indicated that Taiwan has adopted a very active role in the greater Boston area, organizing multiple types of events, such as university and company visits, building strong networks and collaborations, connecting entrepreneurs and the available venture capital of the Boston Innovation Ecosystem, introduction of the Boston research and business market⁴⁵. However, the Taiwanese representation rarely takes part to any event organized by S&TDC and they were events relating to administration issues and better internal practices, according to the publicly available data.	

⁴⁵ https://www.taiwanembassy.org/usbos_en/post/2614.html.

Thailand

Country	Thailand
Type of Diplomatic Presence	Honorary Consulate
Address	41 Union St.
Postal Code	02108
District	Boston, MA
Phone Number	(617) 4720-8424
Email	cg@thaiconsulatebos.org
Website	https://thaiembdc.org/royal-thai-honorary-consulates-general-in-the-u-s/
Language	English, Thai
Science Diplomacy Presence	Yes
Science Attaché	No
Website Science Innovation	Yes
Government Science Representation	Ministry of Science & Technology
Profit / Non-profit Science Representation	No
S&TDC member	No
Notes Thailand deploys Science Diplomacy in the broader region of US since 2015. The official website of the Consulate General of Thailand has a separate tab for the Science and Technology initiative of the Thai Government and the Science Diplomacy is an inextricable part of the Thai Foreign Policy. Specifically, Thailand and US have signed the Agreement of Scientific and Technical Cooperation which provides an important framework for agencies on both sides to explore areas of mutual interest – ranging from research collaboration, energy, biodiversity, national laboratories, STEM education, and other exchanges ⁴⁶ . However, according to our research we were unable to find any further information regarding any events organized by the Thai Consulate.	

⁴⁶ <https://thaiembdc.org/science-and-technology/>.

Europe

Albania

Country	Albania
Type of Diplomatic Presence	Honorary Consulate
Address	162 Boylston St.
Postal Code	02116
District	Boston, MA
Phone Number	(617) 482-2002
Email	janechristo@gmail.com
Website	N/A
Language	English
Science Diplomacy Presence	No
Science Attaché	N/A
Website Science Innovation	N/A
Government Science Representation	N/A
Profit / Non-profit Science Representation	N/A
S&TDC member	No
Notes Albania is a country that currently does not deploy any kind of form of Science Diplomacy in the greater Boston area. Therefore, any information regarding the Science Diplomacy is unavailable for now, since even the contact information is incomplete.	

Austria

Country	Austria
Type of Diplomatic Presence	Honorary Consulate
Address	15 School St.
Postal Code	02108
District	Boston, MA
Phone Number	(617) 227-3131
Email	info@Austria-BOS.org
Website	http://www.austria-bos.org
Language	English
Science Diplomacy Presence	Yes
Science Attaché	No
Website Science Innovation	No
Government Science Representation	No
Profit / Non-profit Science Representation	Ascina
S&TDC member	Yes
Notes Austria is deploying a form of Science Diplomacy in the Boston Innovation Ecosystem in association with Ascina. “ASciNA is committed to provide a platform to support and represent the interests of Austrian scientists and scholars in North America towards relevant stakeholders including the Austrian governmental bodies as well as the Austrian public” ⁴⁷ . Ascina has organized more than 35 events (university visits, biotech companies network events) during the period 2014-2017. However, there are no available data for the years 2018-2020. Austria is member of the S&TDC however its participation in the various events is rare according to our available data.	

⁴⁷ <https://ascina.at/about-us/>.

Belgium

Country	Belgium
Type of Diplomatic Presence	Honorary Consulate
Address	500 Main St.
Postal Code	02142
District	Cambridge, MA
Phone Number	(857) 259-2070
Email	diplobelboston@gmail.com
Website	https://unitedstates.diplomatie.belgium.be/en/embassy-and-consulates//honorary-consulates/addresses#massachusetts
Language	English, French, NL
Science Diplomacy Presence	Yes
Science Attaché	Yes
Website Science Innovation	Yes
Government Science Representation	No
Profit / Non-profit Science Representation	Wallonia.be
S&TDC member	Yes
Notes Belgium seems to have a very active role in deploying Science Diplomacy in the broader Boston area. Belgium has deployed in its Consulate General in Boston Science Attaché and its official website, despite that it does not contain a separate tab relevant to Science & Technology, is enriched with a section called “Clubs & Associations”, where describes and announces the various events of networking and collaborations. Our research tracked only university visits, organized by the Belgian Consulate and the Wallonia.be. The location of the consulate can be defined as strategic since it is in the heart of the most renowned Universities, research communities and the world leading S&T departments. Wallonia.be is an initiative of branding the whole country and highlighting the competitive strengths of the region, “as a vector of mobilization” ⁴⁸ . Moreover, our research indicated that Belgium is also an active member of the S&TDC, since its participation can be characterized as very high and its engagement very early (Belgium is one of the first members of the S&TDC since 2014).	

⁴⁸ <http://www.wallonia.be/en/brand-wallonia>.

Bulgaria

Country	Bulgaria
Type of Diplomatic Presence	Honorary Consulate
Address	255 Washington St.
Postal Code	02458
District	Newton, MA
Phone Number	(617) 219-1490 / (617) 796-8242
Email	aportnoy@reitmr.com
Website	N/A
Language	N/A
Science Diplomacy Presence	Yes
Science Attaché	No
Website Science Innovation	N/A
Government Science Representation	No
Profit / Non-profit Science Representation	No
S&TDC member	No
Notes We could say that Bulgaria has kept a more conservative way of deploying Science Diplomacy in the Boston Innovation Ecosystem. According to the Ittelson's et al. (2019) report, Bulgarian's main focus is to: • Promote the Bulgarian business environment to persuade Boston-based to expand their footprint in Bulgaria • Partner with US universities to file joint-research grants in Bulgaria Our research did not indicate any collaboration among the diplomatic representation with the Government or any profit or non-profit organization. Moreover, Bulgaria has not introduced itself and its practices to the S&TDC yet, since according to our available data it seems that Bulgaria has not participated to any event. However, despite their scientific and technological attempt established in the Boston Innovation Ecosystem, the Bulgarian contact information are incomplete, posing more obstacles for universal inclusion.	

Cyprus

Country	Cyprus
Type of Diplomatic Presence	Honorary Consulate
Address	N/A
Postal Code	02142
District	Cambridge, MA
Phone Number	N/A
Email	N/A
Website	N/A
Language	N/A
Science Diplomacy Presence	No
Science Attaché	N/A
Website Science Innovation	N/A
Government Science Representation	No
Profit / Non-profit Science Representation	No
S&TDC member	No
Notes Cyprus is a country that currently does not deploy any kind of form of Science Diplomacy in the greater Boston area. Therefore, any information regarding the Science Diplomacy is unavailable for now, since even the contact information is incomplete.	

Czech Republic

Country	Czech Republic
Type of Diplomatic Presence	Honorary Consulate
Address	28 Howe St.
Postal Code	02482
District	Wellesley, MA
Phone Number	(617) 358-1776
Email	boston@honorary.mzv.cz
Website	N/A
Language	N/A
Science Diplomacy Presence	No
Science Attaché	N/A
Website Science Innovation	N/A
Government Science Representation	No
Profit / Non-profit Science Representation	No
S&TDC member	No
Notes Czech Republic is a country that currently does not deploy any kind of form of Science Diplomacy in the greater Boston area. Therefore, any information regarding the Science Diplomacy is unavailable for now, since even the contact information is incomplete.	

Denmark

Country	Denmark
Type of Diplomatic Presence	Honorary Consulate
Address	245 Main St.
Postal Code	02142
District	Cambridge, MA
Phone Number	(857) 770-0838
Email	anapen@um.dk / bosinn@um.dk
Website	https://usa.um.dk/en/about-us/innovation-centre-denmark-boston/
Language	English, Danish
Science Diplomacy Presence	Yes
Science Attaché	Yes
Website Science Innovation	Yes
Government Science Representation	Ministry of Higher Education and Science (MHES)
Profit / Non-profit Science Representation	No
S&TDC member	Yes

Notes

Denmark was the first country that deployed the Science Attaché as the formal representation of the Ministry of Foreign Affairs in the Bay Area and expanded to the rest of the Innovation Ecosystems. “The newly established (2019) Innovation Centre Denmark is building bridges between research institutions and tech companies in Denmark and Boston area; accelerate the entry of Danish companies into Greater Boston Area; and facilitate research cooperation and assist Danish companies in being on the cutting edge of new technologies”⁴⁹, despite that its presence in the broader Boston area is established since 2014 according to its participation to the S&TDC events, even though it is low. According to the Ittelson’s et. al report (2019) Denmark’s main goal through the deployment of Science Diplomacy are to:

- Provide consulting services for start-ups to penetrate US STI markets
- Look for research collaborations in clinical research and other life science areas
- Build fellowship agreement with MIT for PhDs & PostDocs
- Match MIT students with Danish research institutions and companies for internships

Our research in the newsfeed of the official website of the Danish Consulate indicated that Denmark reaches these goals in the greater Boston area by organizing multiple types of events, such as university visits, building strong networks and collaborations, introducing new technologies deployed in the Boston Innovation Ecosystem, introduction of the Boston research and business market.

⁴⁹ <https://usa.um.dk/en/about-us/innovation-centre-denmark-boston/>.

Estonia

Country	Estonia
Type of Diplomatic Presence	Honorary Consulate
Address	2222 Centre St.
Postal Code	02132
District	Boston, MA
Phone Number	(617) 543-9234
Email	annereet.annunziata@mfa.ee
Website	N/A
Language	N/A
Science Diplomacy Presence	Yes
Science Attaché	No
Website Science Innovation	No
Government Science Representation	None
Profit / Non-profit Science Representation	None
S&TDC member	Yes
Notes We could say that Estonia has kept a more conservative way of deploying Science Diplomacy in the Boston Innovation Ecosystem. Our research did not indicate any collaboration among the diplomatic representation with the Government or any profit or non-profit organization. Estonia has introduced itself and its practices to the S&TDC according to our available data. However, despite its scientific and technological attempt established in the Boston Innovation Ecosystem, the Estonian contact information are incomplete, posing more obstacles for universal inclusion.	

Finland

Country	Finland
Type of Diplomatic Presence	Honorary Consulate
Address	111 Devonshire St.
Postal Code	02109
District	Boston, MA
Phone Number	(857) 304-0405
Email	leonardkopelman@gmail.com
Website	https://finlandabroad.fi/web/usa/honorary-consulates/-/asset_publisher/4sNllRsmWs2r/contentInfoOrganization/id/120013
Language	English, Suomi, Svenska
Science Diplomacy Presence	Yes
Science Attaché	No
Website Science Innovation	No
Government Science Representation	None
Profit / Non-profit Science Representation	Team Finland
S&TDC member	No
Notes Finland is deploying currently a more conservative form Science Diplomacy in the Boston Innovation Ecosystem. The official website of the Consulate General of Finland in Boston does not contain any separate section regarding Science & Technology, however there is a section referring exclusively for business promotion ⁵⁰ . The Finland Network on the other hand “helps companies to go global” providing market opportunities, advice & training, financing services etc ⁵¹ . Finland has not yet introduced itself in the S&TDC, since our available data do not indicate any participation of Finland to any events organized by the S&TDC.	

⁵⁰ <https://finlandabroad.fi/web/usa/for-companies>.

⁵¹ <https://www.team-finland.fi/en/>.

France

Country	France
Type of Diplomatic Presence	Consulate
Address	31 St James Ave.
Postal Code	02116
District	Boston, MA
Phone Number	(617) 865-3001
Email	consulat.boston-cslt@diplomatie.gouv.fr
Website	https://boston.consulfrance.org/-English-
Language	English, French
Science Diplomacy Presence	Yes
Science Attaché	Yes
Website Science Innovation	Yes
Government Science Representation	None
Profit / Non-profit Science Representation	None
S&TDC member	Yes
Notes France seems to have a very active role in deploying Science Diplomacy in the broader Boston area. France has deployed in its Consulate General in Boston Science Attaché and in its official website, despite that it does not contain a separate tab relevant to Science & Technology, the Consulate has deployed the Office for Science and Technology, which provides links for newsletters, events, programs for young entrepreneurs, venture accelerators, MIT collaborations and suggestions for businesses to connect business actors in New-England with French start-ups, professionals and employees⁵². France has also put a lot of effort for solving and building common interests by pursuing collaborations for issues regarding climate change and global warming. According to the Ittelson's et al. (2019) report its main focus is to: • Advertise and promote businesses in France • Advertise and promote R&D opportunities in France • Communicate and advocate public policy for their S&T objectives to Boston Innovation Ecosystem (climate change) Our research did not track any collaboration with any profit or non-profit organization, but indicated that France is also an active member of the S&TDC, since its participation can be characterized as very high and its engagement very early (France is one of the first members of the S&TDC since 2014).	

⁵² <https://boston.consulfrance.org/-Office-for-Science-and-Technology->

Germany

Country	Germany
Type of Diplomatic Presence	Consulate
Address	3 Copley Place
Postal Code	02116
District	Boston, MA
Phone Number	N/A
Email	N/A – Inquiry Form
Website	https://www.germany.info/us-en/embassy-consulates/boston
Language	English, German
Science Diplomacy Presence	Yes
Science Attaché	Yes
Website Science Innovation	No
Government Science Representation	None
Profit / Non-profit Science Representation	German Accelerator
S&TDC member	Yes
Notes Germany seems to have a very active role in deploying Science Diplomacy in the broader Boston area. Germany has deployed in its Consulate General in Boston Science Attaché but its official website, does not contain any separate tab relevant to Science & Technology. However, the Consulate facilitates the Science Department. “The Science and Technology Section fosters German interests in technology, science and research in New England and serves as an information broker about science and research in Germany”⁵³. Our research in the newsfeed of the official website of the German Consulate indicated that Germany in the greater Boston area organizes multiple types of events, such as university and company visits, building strong networks and collaborations, introducing new technologies deployed in the Boston Innovation Ecosystem, introduction of the home country research and business market. We tracked a collaboration with the organization German Accelerator⁵⁴, which specifically in Boston specializes in life sciences (The Boston program). We indicated that Germany is also an active member of the S&TDC, since its participation can be characterized as very high and its engagement very early (France is one of the first members of the S&TDC since 2014).	

⁵³ <https://www.germany.info/us-en/embassy-consulates/boston/-/1337080>.

⁵⁴ <https://www.germanaccelerator.com/about-us/>.

Greece

Country	Greece
Type of Diplomatic Presence	Consulate General
Address	86 Beacon St.
Postal Code	02108
District	Boston, MA
Phone Number	(617) 523-0100
Email	rgencon.bos@mfa.gr
Website	https://www.mfa.gr/usa/en/consulate-general-in-boston
Language	English, Greek
Science Diplomacy Presence	Yes
Science Attaché	No
Website Science Innovation	Yes
Government Science Representation	None
Profit / Non-profit Science Representation	Hellenic Innovation Network
S&TDC member	Yes
Notes Greece has started to make small but steady steps regarding the deployment of Science Diplomacy in the Boston Innovation Ecosystem. The main page to interact with the innovation and science community is their Facebook page⁵⁵. Currently, the Consulate General (CG) in Boston is collaborating closely with the Hellenic Innovation Network (their agendas are parallel), a non-profit organization, which, “an outgrowth of MIT Enterprise Forum Greece, was created to empower startups from Greece and Cyprus (“Greek startups”) with a bridge to the U.S. through pitching and networking opportunities”⁵⁶. The CG official website is facilitated with external link⁵⁷, which has as a main goal to promote investments in the home country, by advertising the competitive characteristics of the Greek market. Our research in the newsfeed of the official website of the Hellenic Innovation Network indicated that the organization in the greater Boston area organizes multiple types of events (most of them during and relevant to the pandemic of COVID-19, since the online meetings limited the constrain of the distance). For the first time, Greece participated this year in the MIT Career Fair, together with other Consulates⁵⁸. A key element in their Science Diplomacy efforts is their diaspora, key placed in several innovation fields. We had so far events that gathered more than 200 people, featuring speakers such as MIT Media Lab Founder Nicholas Negroponte and world class webinars –together with the HIN- featuring the Chairman of BIOGEN Dr. Papadopoulos and the world’s best cybersecurity expert Dr Alex Stamos. Moreover, the CG organized meetings with the Israeli diplomatic presence in Boston and entrepreneurs to introduce new practices and technologies. However, even though Greece is member of the S&TDC, its participation to any event is really low.	

⁵⁵ <https://www.facebook.com/search/top?q=consulate%20general%20of%20greece%20in%20boston>.

⁵⁶ <https://www.hellenic.org>.

⁵⁷ <https://www.enterprisegreece.gov.gr/en/>.

⁵⁸ Kampouris, Nick, “Greek Companies Participate for the First Time in MIT European Career Fair”, greekreporter.com, <https://usa.greekreporter.com/2020/02/29/greek-companies-participate-for-the-first-time-in-mit-european-career-fair/>, (accessed on 29 July, 2020).

Hungary

Country	Hungary
Type of Diplomatic Presence	Honorary Consulate
Address	111 Huntington Ave
Postal Code	02199
District	Boston
Phone Number	(617) 226-3190
Email	hconsulate@foley.com
Website	http://consulate-hungary-boston.com
Language	English, Hungarian
Science Diplomacy Presence	No
Science Attaché	N/A
Website Science Innovation	N/A
Government Science Representation	N/A
Profit / Non-profit Science Representation	N/A
S&TDC member	No
Notes Hungary is a country that currently does not deploy any kind of form of Science Diplomacy in the greater Boston area. Therefore, any information regarding the Science Diplomacy is unavailable for now.	

Iceland

Country	Iceland
Type of Diplomatic Presence	Honorary Consulate
Address	c/o GerrityStone Inc. 225-B Merrimac St.
Postal Code	01801
District	Woburn, MA
Phone Number	(781) 938-1820
Email	jgerrity@gerritystone.com
Website	N/A
Language	N/A
Science Diplomacy Presence	No
Science Attaché	N/A
Website Science Innovation	N/A
Government Science Representation	N/A
Profit / Non-profit Science Representation	N/A
S&TDC member	No
Notes Iceland is a country that currently does not deploy any kind of form of Science Diplomacy in the greater Boston area. Therefore, any information regarding the Science Diplomacy is unavailable for now, since even the contact information is incomplete.	

Ireland

Country	Ireland
Type of Diplomatic Presence	Consulate
Address	535 Boylston St.
Postal Code	
District	Boston, MA
Phone Number	(617) 267-9330
Email	N/A – Inquiry Form
Website	https://www.dfa.ie/irish-consulate/boston/
Language	English
Science Diplomacy Presence	Yes
Science Attaché	No
Website Science Innovation	No
Government Science Representation	None
Profit / Non-profit Science Representation	IDA Ireland
S&TDC member	Yes
Notes Ireland seems to have established its actions regarding the deployment of Science Diplomacy in the Boston Innovation Ecosystem. However, our research could not track any events, organized by the Irish Consulate regarding the Science & Technology Diplomacy. “Ireland's inward investment promotion agency, the IDA, is a non-commercial, semi-state body promoting Foreign Direct Investment into Ireland through a wide range of services. We partner with potential and existing investors to help them establish or expand their operations in Ireland” ⁵⁹ . Our research could track only events that correlated with bridging entrepreneurs with the available venture capital in the Boston Innovation Ecosystem. Ireland is a member of the S&TDC and despite its first participation took place in 2016, Irish engagement can be characterized as medium (in relevance to the participation of the rest of the countries).	

⁵⁹ <https://www.idaireland.com/search?searchtext=boston&searchmode=anyword>

Italy

Country	Italy
Type of Diplomatic Presence	Consulate
Address	600 Atlantic Ave
Postal Code	02110
District	Boston, MA
Phone Number	(617) 722-9201 / -02 / -03
Email	urp.boston@esteri.it
Website	https://consboston.esteri.it/consolato_boston/it/
Language	English, Italian
Science Diplomacy Presence	Yes
Science Attaché	No
Website Science Innovation	Yes
Government Science Representation	None
Profit / Non-profit Science Representation	DBiT
S&TDC member	Yes
Notes Italy seems to have established its actions regarding the deployment of Science Diplomacy in the Boston Innovation Ecosystem. Our research in the newsfeed of the official website of the Italian Consulate indicated that Italy in the greater Boston area organizes multiple types of events, such as university and company visits, building strong collaborations, introducing entrepreneurs to the available venture capital in the Boston Innovation Ecosystem, introduction of the home country research and business market⁶⁰. DBiT is an online portal of the Boston Consulate General of Italy. As a database generates new networking opportunities for students, researchers, professors and Italian start-uppers in New England who can sign up and make contacts⁶¹. However, the link is not working. Italy is a member of the S&TDC and despite its first participation took place in 2016, Irish engagement can be characterized as medium (in relevance to the participation of the rest of the countries).	

⁶⁰ https://consboston.esteri.it/consolato_boston/en/in_linea_con_utente/affari.html

⁶¹ <https://www.italyinboston.org/dbit>.

Latvia

Country	Latvia
Type of Diplomatic Presence	Honorary Consulate
Address	512 Chestnut St.
Postal Code	02492
District	Needham, MA
Phone Number	(781) 444-2939
Email	talis.seja@gmail.com
Website	N/A
Language	N/A
Science Diplomacy Presence	No
Science Attaché	N/A
Website Science Innovation	N/A
Government Science Representation	N/A
Profit / Non-profit Science Representation	N/A
S&TDC member	Yes
Notes Our research did not indicate any Science Diplomacy deployment by Latvia. However, Latvia has introduced itself to the S&TDC, as according to our available data it seems that its participation and engagement has started since 2014, but they are really low. However, despite its scientific and technological attempt established in the Boston Innovation Ecosystem, the Latvian contact information are incomplete, posing more obstacles for universal inclusion.	

Liechtenstein

Country	Liechtenstein
Type of Diplomatic Presence	Honorary Consulate
Address	7 Dexter St.
Postal Code	02026
District	Dedham, MA
Phone Number	(339) 225-0989
Email	N/A
Website	N/A
Language	N/A
Science Diplomacy Presence	Yes
Science Attaché	No
Website Science Innovation	No
Government Science Representation	None
Profit / Non-profit Science Representation	None
S&TDC member	Yes
Notes Our research did not indicate any Science Diplomacy deployment by Liechtenstein. However, Liechtenstein has introduced itself to the S&TDC, since according to our available data it seems that its participation and engagement has started since 2016, but they are really low. However, despite its scientific and technological attempt established in the Boston Innovation Ecosystem, the Liechtenstein contact information are incomplete, posing more obstacles for universal inclusion.	

Lithuania

Country	Lithuania
Type of Diplomatic Presence	Honorary Consulate
Address	48 Ticklefancy Lane
Postal Code	03079
District	Salem, MA
Phone Number	(603) 893-1859
Email	N/A
Website	N/A
Language	N/A
Science Diplomacy Presence	Yes
Science Attaché	No
Website Science Innovation	No
Government Science Representation	None
Profit / Non-profit Science Representation	Start-up Lithuania
S&TDC member	No
Notes Our research indicated a form of Science Diplomacy deployment by Lithuania. Start-up Lithuania “Startup Lithuania is powered by Enterprise Lithuania, the governmental institution, which aims to support business establishment, entrepreneurship and fosters export” ⁶² . Lithuania has not introduced itself to the S&TDC, according to our available data. However, despite its scientific and technological attempt established in the Boston Innovation Ecosystem, the Lithuanian contact information are incomplete, posing more obstacles for universal inclusion.	

⁶² <https://www.startuplithuania.com/news/?s=boston>.

Luxembourg

Country	Luxembourg
Type of Diplomatic Presence	Honorary Consulate
Address	50 Milk St.
Postal Code	02109
District	Boston, MA
Phone Number	(617) 772-1399
Email	susan.livingston@bbh.com
Website	N/A
Language	N/A
Science Diplomacy Presence	No
Science Attaché	N/A
Website Science Innovation	N/A
Government Science Representation	N/A
Profit / Non-profit Science Representation	N/A
S&TDC member	No
Notes Luxembourg is a country that currently does not deploy any kind of form of Science Diplomacy in the greater Boston area. Therefore, any information regarding the Science Diplomacy is unavailable for now, since even the contact information is incomplete.	

Malta

Country	Malta
Type of Diplomatic Presence	Honorary Consulate
Address	56 Lantern Road
Postal Code	02478
District	Belmont, MA
Phone Number	(617) 484-1731
Email	maltaconsul.boston@gov.mt
Website	N/A
Language	N/A
Science Diplomacy Presence	No
Science Attaché	N/A
Website Science Innovation	N/A
Government Science Representation	N/A
Profit / Non-profit Science Representation	N/A
S&TDC member	No
Notes Malta is a country that currently does not deploy any kind of form of Science Diplomacy in the greater Boston area. Therefore, any information regarding the Science Diplomacy is unavailable for now, since even the contact information is incomplete.	

Monaco

Country	Monaco
Type of Diplomatic Presence	Honorary Consulate
Address	7 Acacia St.
Postal Code	02138
District	Cambridge, MA
Phone Number	(617) 492-2968
Email	rspence@MonacoBoston.org
Website	http://monacodc.org/network.html
Language	English
Science Diplomacy Presence	Yes
Science Attaché	No
Website Science Innovation	No
Government Science Representation	Collaboration with Canada
Profit / Non-profit Science Representation	None
S&TDC member	Yes
Notes According to the Ittelson's et al. (2019) report, Monaco collaborates with Canada, in order to establish itself as present in the Boston Innovation Ecosystem through Science Diplomacy. However, our research could not track any events relevant to any form of Science Diplomacy. According to the Ittelson's et al. (2019) report, Monaco's main focus is to: Promote public policy to communicate and advocate their S&T policy objectives to Boston Innovation Ecosystem Monaco is also a member of the S&TDC since 2016, but its participation and engagement to the various events can be characterized as low.	

Netherlands

Country	Netherlands
Type of Diplomatic Presence	Honorary Consulate
Address	50 Milk St.
Postal Code	02109
District	Boston, MA
Phone Number	(857) 415-4773
Email	boston@nlconsulate.com
Website	https://www.netherlandsandyou.nl/your-country-and-the-netherlands/united-states/about-us/honorary-consulate-in-boston
Language	English, + many other languages
Science Diplomacy Presence	Yes
Science Attaché	Yes
Website Science Innovation	No
Government Science Representation	None
Profit / Non-profit Science Representation	Innovation Attaché Network, Holland Innovation Network - HIN
S&TDC member	Yes
Notes Netherlands seems to have established its actions regarding the deployment of Science Diplomacy in the Boston Innovation Ecosystem. Our research in the newsfeed of the official website of the Holland Consulate indicated that Netherlands in the greater Boston area organizes multiple types of events, such as university and company visits, encouraging the interested parts to collaborate for proposing more efficient practices regarding the administrative issues and building strong networks and collaborations. Moreover, we traced two organizations, the Innovation Attaché Network, which “The Netherlands Innovation Attaché Network in North America stimulates international cooperation between companies, knowledge institutes and governments in the fields of innovation, technology and science”⁶³ and the Holland Innovation Network (HIN), which specifically in Boston it specializes on & Horticulture, Water Management, Sustainable Urban planning etc⁶⁴. According to the Ittelson’s et al. (2019) report, its main focus is to : • Track the innovation trends in the STI startup sphere • Increase connections with the Boston STI ecosystem on regenerative research Netherlands, according to our available data, is member of the S&TDC since 2015 and its participation and engagement is really high.	

⁶³ <http://nlintheusa.com/innovation-network/>.

⁶⁴ <http://nlintheusa.com/#top>.

Norway

Country	Norway
Type of Diplomatic Presence	Honorary Consulate
Address	326 A St.
Postal Code	02210
District	Boston, MA
Phone Number	(617) 849-8556
Email	tonje@bluecrestsoft.com
Website	https://www.norway.no/en/usa/norway-usa/honorary-consulates/#Massachusetts
Language	English, Norwegian
Science Diplomacy Presence	No
Science Attaché	N/A
Website Science Innovation	N/A
Government Science Representation	N/A
Profit / Non-profit Science Representation	N/A
S&TDC member	No
Notes Norway is a country that currently does not deploy any kind of form of Science Diplomacy in the greater Boston area. Therefore, any information regarding the Science Diplomacy is unavailable for now. However, our research indicated that a section in the official website of the Norwegian Consulate, the Government highlights the values and priorities of the country but not specifically on science and innovation ⁶⁵ .	

⁶⁵ <https://www.norway.no/en/usa/values-priorities/>.

Poland

Country	Poland
Type of Diplomatic Presence	Honorary Consulate
Address	22 Pratt Ct.
Postal Code	02025
District	Cohasset, MA
Phone Number	(617) 357-1980
Email	polishconsul@comcast.net
Website	http://polishconsul.tripod.com
Language	English
Science Diplomacy Presence	Yes
Science Attaché	No
Website Science Innovation	No
Government Science Representation	None
Profit / Non-profit Science Representation	PolSciNetBos
S&TDC member	Yes
Notes Poland seems to deploy Science Diplomacy in the broader Boston area. The General Polish Consulate of Boston however does not facilitate currently a Science Attaché according to our research. However, the Polish diplomatic representation collaborates with the Polish Scientific Network in Boston -PolSciNetBos-, which aims to expand the scientific horizons and to establish personal and professional connections ⁶⁶ . The events that PolSciNetBos organizes focuses on building strong networks and introducing new technological trends of the Boston Innovation Ecosystem. Poland is member of the S&TDC since the mid 2014 and its participation and engagement can be considered high.	

⁶⁶ <http://polscinetbos.org>.

Portugal

Country	Portugal
Type of Diplomatic Presence	Honorary Consulate
Address	31 Street James Ave
Postal Code	02116
District	Boston, MA
Phone Number	(617) 536-8740
Email	consulado.boston@mne.pt
Website	http://www.cgportugalboston.com/consulado.html
Language	Portugal
Science Diplomacy Presence	Yes
Science Attaché	No
Website Science Innovation	No
Government Science Representation	None
Profit / Non-profit Science Representation	Portugal Ventures MIT Portugal
S&TDC member	No
Notes Portugal seems to deploy a form of Science Diplomacy in the broader Boston region. Currently the General Portuguese Consulate in Boston does not facilitate any Science Attaché and the lack of the English version of the content of the General Portuguese Consulate's official website make even harder the broader audience to get access to their information. Our research traced two organizations, the Portugal ventures - "Portugal Ventures' mission is to provide ecosystem support to global businesses emerging from its Ignition Program" ⁶⁷ - and the MIT Portugal program - "The MIT Portugal program is an international collaboration that demonstrates an investment in science, technology, and higher education can have a positive, lasting impact on the economy" ⁶⁸ . Despite its extended attempts for deploying Science Diplomacy in the Boston Innovation Ecosystem, Portugal has not been introduced to the S&TDC yet, according to our available data.	

⁶⁷ <https://www.prnewswire.com/news-releases/portugal-ventures-to-establish-center-in-boston-massachusetts-245198731.html>.

⁶⁸ <https://www.mitportugal.org>.

Romania

Country	Romania
Type of Diplomatic Presence	Honorary Consulate
Address	15 North Beacon St.
Postal Code	02134
District	Boston, MA
Phone Number	(617) 497-1111
Email	roconsulboston@aol.com / vamigab@yahoo.com
Website	www.roconsulboston.com
Language	English
Science Diplomacy Presence	No
Science Attaché	N/A
Website Science Innovation	N/A
Government Science Representation	N/A
Profit / Non-profit Science Representation	N/A
S&TDC member	No
Notes Romania is a country that currently does not deploy any kind of form of Science Diplomacy in the greater Boston area. Therefore, any information regarding the Science Diplomacy is unavailable for now.	

Slovak Republic

Country	Slovak Republic
Type of Diplomatic Presence	Honorary Consulate
Address	3 Round Hill Road
Postal Code	02493
District	Weston
Phone Number	(781) 656-5065
Email	slovakconsulate@muzila.net
Website	https://www.mzv.sk/web/en/consular_info/slovak_honorary_consulates_abroad/-/asset_publisher/Uazsbsq51b8l/content/konzularny-urad-boston/10182
Language	English, Slovensky
Science Diplomacy Presence	No
Science Attaché	N/A
Website Science Innovation	N/A
Government Science Representation	N/A
Profit / Non-profit Science Representation	N/A
S&TDC member	Yes
Notes Our research could not trace any form of Science Diplomacy deployed by the diplomatic representation of Slovak Republic in the greater Boston area. However, Slovak Republic is member of the S&TDC since the mid of 2014, but its participation and engagement can be characterized as relevantly low, according to our available data.	

Spain

Country	Spain
Type of Diplomatic Presence	Consulate
Address	31 Street James Ave
Postal Code	02116
District	Boston, MA
Phone Number	(617) 536-2506 / -27
Email	cog.boston.vis@maec.es
Website	http://www.exteriores.gob.es/Consulados/BOSTON/en/ServiciosConsulares/ConsularServicesBoston/Pages/Visas.aspx
Language	English, Spanish
Science Diplomacy Presence	Yes
Science Attaché	Yes
Website Science Innovation	No
Government Science Representation	None
Profit / Non-profit Science Representation	FECYT, ECUSA
S&TDC member	Yes

Notes

Spain seems to deploy Science Diplomacy in the broader Boston area. The General Spanish Consulate in Boston facilitates a Science Attaché and our research in the newsfeed of the official website of the German Consulate indicated that Spain in the greater Boston area organizes multiple types of events, such as university visits, building strong networks and collaborations, introducing new technological trends deployed in the Boston Innovation Ecosystem, introduction of not only the home country but also the Boston research and business market. We traced a collaboration with the organizations FECYT – “The Spanish Foundation for Science and Technology (FECYT, from its Spanish initials) is a public foundation under the Ministry of Science and Innovation. FECYT was founded in 2001 with the aim of promoting scientific research of excellence as well as the development and technological innovation necessary to increase the competitiveness of Spanish industry and improve the quality of life of citizens, encouraging collaboration between agents involved in R & D and the dissemination and communication of research and innovation results”⁶⁹ (the language of the website (partially Spanish) makes the newsfeed partially inaccessible and incomprehensible) -and ECUSA – “a non-profit organization made up of Science & Technology professionals with an affinity for Spain who reside in the U.S. Main mission is to promote science, technology and the role of these professional in our society”⁷⁰. Spain despite that is a member of the S&TDC since 2014, its participation and engagement can be characterized as medium (relatively to the participation of the rest of the country-members) according to our available data.

⁶⁹ <https://www.fecyt.es/en/info/presentation>

⁷⁰ <https://ecusa.squarespace.com/newhome>

Sweden

Country	Sweden
Type of Diplomatic Presence	Honorary Consulate
Address	295 Devonshire St.
Postal Code	02110
District	Boston, MA
Phone Number	(617) 451-3456
Email	boston@consulateofsweden.org
Website	https://www.swedenabroad.se/en/about-sweden-non-swedish-citizens/usa/
Language	English
Science Diplomacy Presence	Yes
Science Attaché	No
Website Science Innovation	No
Government Science Representation	None
Profit / Non-profit Science Representation	SACC-NE
S&TDC member	Yes
Notes Our research indicated that Sweden is currently deploying Science Diplomacy in the greater Boston area. Despite that the General Swedish Consulate in Boston does not facilitate any Science Attaché, it collaborates with the SACC-Ne - “SACC-NE’s mission is to accelerate trade, commerce, investment relationships, and support Swedish businesses and individuals succeed in the US market, as well as highlighting entrepreneurial, innovative and educational initiatives between Sweden the US”⁷¹. Our research traced that it organizes multiple types of events, such as university and company visits, building strong networks and collaborations, discussing new practices of Science Diplomacy, introducing new technological trends deployed in the Boston Innovation Ecosystem, introduction of not only the home country but also the Boston research and business market. However, despite its extensive action on Science Diplomacy and the fact that Sweden is member of the S&TDC, its participation and engagement to those events of the S&TDC is really low, according to our available data.	

⁷¹ <https://www.sacc-ne.org>.

Switzerland

Country	Switzerland
Type of Diplomatic Presence	Consulate
Address	420 Broadway
Postal Code	02138
District	Cambridge
Phone Number	(617) 876-3076
Email	info@swissnexusboston.org
Website	https://www.swissnexusboston.org
Language	English
Science Diplomacy Presence	Yes
Science Attaché	Yes
Website Science Innovation	Yes
Government Science Representation	swissnex ⁷² , MFA & Economic affairs, Education & Research ⁷³
Profit / Non-profit Science Representation	No
Notes Switzerland is one of the countries that introduced Science Diplomacy in the Boston Innovation Ecosystem. Abandoning the traditional form of the diplomatic representation in the greater Boston area, the Swiss Government founded the swissnex. “swissnex’s main mission is to connect the dots from Switzerland and the East Coast of the USA to foster exchange in education, research, innovation, and the arts”⁷⁴. swissnex deploys currently four Science Attachés and organizes various events covering all the different types, such as university and company visits, building strong networks and collaborations, bringing together entrepreneurs and the available venture capital in the Boston Innovation Ecosystem, discussing new practices of Science Diplomacy, introducing new technological trends deployed in the Boston Innovation Ecosystem, introduction of not only the home country but also the Boston research and business market. According to the Ittelson’s et al. (2019) report its main focus is to: • Observe STI practices and policies deployed in Boston to replicate and consequently deploy them back in Israel • Collaborate with Red Cross Collaborative Platform for the application of STI to humanitarian work Switzerland is one of the first and most active members of the S&TDC, and its participation and engagement is high and continuous.	

⁷² <https://www.swissnexusboston.org>. It is the official website of the Swiss Consulate. Its main mission is to connect the dots from Switzerland and the East Coast of the USA to foster exchange in education, research, innovation, and the arts.

⁷³ Report: “How countries can interact with Boston Innovation Ecosystem” by Pavlina Ittelson & Jean-Christophe Mauduit.

⁷⁴ <https://www.swissnexusboston.org>.

Turkey

Country	Turkey
Type of Diplomatic Presence	Consulate
Address	31 Street James Ave
Postal Code	02142
District	Boston, MA
Phone Number	(617) 245-4500
Email	consulate.boston@mfa.gov.tr
Website	http://boston.bk.mfa.gov.tr
Language	English, Turkish
Science Diplomacy Presence	Yes
Science Attaché	Yes
Website Science Innovation	No
Government Science Representation	None
Profit / Non-profit Science Representation	None
S&TDC member	Yes
Notes Our research indicated a form of Science Diplomacy deployment by Turkey. The General Turkish Consulate in Boston is facilitated with Science Attaché, but there is no further information regarding their actions and practices in the greater Boston Area. Turkey has introduced itself to the S&TDC, as according to our available data it seems that its participation and engagement has started since 2014, and they are really high.	

United Kingdom

Country	United Kingdom - UK
Type of Diplomatic Presence	Consulate
Address	One Broadway
Postal Code	02142
District	Cambridge, MA
Phone Number	(617) 245-4500
Email	press@ukinboston.com / www.gov.uk/contact-consulate-boston
Website	https://www.gov.uk/world/organisations/british-consulate-general-boston
Language	English
Science Diplomacy Presence	Yes
Science Attaché	Yes
Website Science Innovation	Yes
Government Science Representation	Ministry of Economy
Profit / Non-profit Science Representation	Royal Society
S&TDC member	Yes
Notes The United Kingdom seems to be one of the first nations deploying Science Diplomacy in the Boston Innovation Ecosystem. UK has deployed a council to implement Science Diplomacy in Boston Innovation Ecosystem⁷⁵. The UK facilitates not only a Science Attaché but also corporates with the Royal Society in order to organize various events to establish collaborations among the renowned academic institutions in Boston and the UK and introduce new technological trends. Its main focus according to the Ittelson's et al. (2019) report is: • Bring together for collaboration local (Boston) & UK Institutions • Specialize on societal issues (gender gap in Science, technology, Engineering & Mathematics) • Negotiate and implement S&T agreements. The UK is one of the first members of the S&TDC and its participation and engagement to the various events organized by the S&TDC are very high according to our available data.	

⁷⁵ <https://www.gov.uk/government/organisations/council-for-science-and-technology>.

Middle East

Egypt

Country	Egypt
Type of Diplomatic Presence	Honorary Consulate
Address	N/A
Postal Code	N/A
District	N/A
Phone Number	N/A
Email	N/A
Website	N/A
Language	N/A
Science Diplomacy Presence	Yes
Science Attaché	N/A
Website Science Innovation	N/A
Government Science Representation	N/A
Profit / Non-profit Science Representation	N/A
S&TDC member	No
Notes Egypt is a country that currently deploys a kind of form of Science Diplomacy in the greater Boston area according to the Ittelson's et al. (2019) report, whose main focus is to: • Help to establish research collaborations regarding Egypt's issues such as water desalination & renewable energy. Haower, any information regarding the Science Diplomacy is unavailable for now, since even the contact information is incomplete.	

Israel

Country	Israel
Type of Diplomatic Presence	Consulate
Address	20 Park Plaza
Postal Code	02116
District	Boston, MA
Phone Number	(617) 535-0210 / -09
Email	consulardep@boston.mfa.gov.il
Website	https://embassies.gov.il/BOSTON/CONSULARSERVICES/Pages/Contact-Consular-Services.aspx
Language	English
Science Diplomacy Presence	Yes
Science Attaché	Yes
Website Science Innovation	Yes
Government Science Representation	None
Profit / Non-profit Science Representation	None
S&TDC member	Yes
Notes Israel is deploying Science Diplomacy in the Boston Innovation Ecosystem in order to enhance its competitive position, by sharply defining scientific and technological policies. Despite the Science Diplomatic presence, however there is no available link for further access⁷⁶. Israel's Foreign Policy in the framework of Science Diplomacy aims to: • Deploy academic partnerships and training in the cybersecurity domain • Observe STI practices and policies deployed in Boston to replicate and consequently deploy them back in Israel Israel has organized numerous events in collaboration with other diplomatic representations in the broader region of Boston, such as the General Greek Consulate. On the other hand, Israel's participation in the events organized by the S&TDC is low and limited only to administration meetings (according to the available information).	

⁷⁶ <https://embassies.gov.il/boston/AboutIsrael/ScienceTechnology/Pages/Departments.aspx>.

Lebanon

Country	Lebanon
Type of Diplomatic Presence	Honorary Consulate
Address	366 N. Main St.
Postal Code	01810
District	Andover, MA
Phone Number	(978) 289-4142 / -3
Email	abrahamhanna@hotmail.com
Website	https://honconslebbost.org
Language	English
Science Diplomacy Presence	No
Science Attaché	N/A
Website Science Innovation	N/A
Government Science Representation	N/A
Profit / Non-profit Science Representation	N/A
S&TDC member	No
Notes Lebanon is a country that currently does not deploy any kind of form of Science Diplomacy in the greater Boston area. Therefore, any information regarding the Science Diplomacy is unavailable for now.	

Pakistan

Country	Pakistan
Type of Diplomatic Presence	Honorary Consulate
Address	1032 Main St.
Postal Code	02054
District	Millis, MA
Phone Number	(617) 267-9000
Email	pakistan@tiac.net
Website	N/A
Language	N/A
Science Diplomacy Presence	Yes
Science Attaché	No
Website Science Innovation	None
Government Science Representation	None
Profit / Non-profit Science Representation	None
S&TDC member	Yes
Notes Pakistan diplomatic representation in Boston does not have any official website. Therefore, it was impossible to find and extract information regarding the type of the Science Diplomacy that Pakistan Government is deploying in the Boston Innovation Ecosystem. Pakistan is member of the S&TDC and its participation can be characterized as medium with main focus on administration issues and university visits.	

United Arab Emirates

Country	United Arab Emirates
Type of Diplomatic Presence	Consulate
Address	One International Place
Postal Code	02110
District	Boston, MA
Phone Number	(617) 948-8800
Email	bostoncon@mofaic.gov.ae
Website	https://boston.uae-embassy.org
Language	English
Science Diplomacy Presence	Yes
Science Attaché	Yes
Website Science Innovation	None
Government Science Representation	None
Profit / Non-profit Science Representation	None
S&TDC member	Yes
Notes Despite the Science Diplomacy representation of United Arab Emirates in the Boston Innovation Ecosystem, there are no publicly available data regarding any events or information about its Science Diplomacy practices in the broader area.	

North America

Canada

Country	Canada
Type of Diplomatic Presence	Consulate
Address	3 Copley Place
Postal Code	02116
District	Boston, MA
Phone Number	(844) 880-6519
Email	boston.commerce@international.gc.ca
Website	https://www.international.gc.ca/country-pays/us-eu/boston.aspx?lang=eng
Language	English, French
Science Diplomacy Presence	Yes
Science Attaché	Yes
Website Science Innovation	Yes
Government Science Representation	CTA – International Business Development Section
Profit / Non-profit Science Representation	None
S&TDC member	Yes
Notes Canada seems to have a very active role in deploying Science Diplomacy in the broader Boston area. Quebec's Government office is facilitated with Science Attaché, and its official website refers that "Innovation, Science and Economic Development Canada (ISED) works with Canadians in all areas of the economy and in all parts of the country to improve conditions for investment, enhance Canada's innovation performance, increase Canada's share of global trade and build a fair, efficient and competitive marketplace"⁷⁷. Our research in the newsfeed of the official website of the Canadian Consulate indicated that Canada in the greater Boston area organizes multiple types of events, such as company visits, building strong collaborations and introducing new technological trends deployed in the Boston Innovation Ecosystem. We traced that "The International Business Development (IBD) Section at the Consulate General of Canada in Boston drives value and innovation in New England by connecting your business to Canada"⁷⁸. According to the Ittelson's et al. (2019) report, Quebec's main focus is to: • Consulting services for start-ups to penetrate US STI markets • Inform foreign researchers for incentives to pursuit a career in Canada • Observe STI practices and policies deployed in Boston to replicate and consequently deploy them back in Canada. Canada is one of the first and most active members of the S&TDC, and its participation and engagement is high and continuous.	

⁷⁷ <https://www.ic.gc.ca/eic/site/icgc.nsf/eng/home>.

⁷⁸ <https://canadabostonconnect.com>

El Salvador

Country	El Salvador
Type of Diplomatic Presence	Consulate
Address	46 Bennington St.
Postal Code	02128
District	Boston, MA
Phone Number	N/A
Email	N/A
Website	N/A
Language	N/A
Science Diplomacy Presence	No
Science Attaché	N/A
Website Science Innovation	N/A
Government Science Representation	N/A
Profit / Non-profit Science Representation	N/A
S&TDC member	No
Notes Bolivia is a country that currently does not deploy any kind of form of Science Diplomacy in the greater Boston area. Therefore, any information regarding the Science Diplomacy is unavailable for now, since even the contact information is incomplete.	

Haiti

Country	Haiti
Type of Diplomatic Presence	Consulate
Address	333 Washington St.
Postal Code	02108
District	Boston, MA
Phone Number	(617) 266-3660 / -3707
Email	Cg.boston@diplomatie.ht
Website	http://www.haiti.org/consular-offices/
Language	English
Science Diplomacy Presence	Yes
Science Attaché	Yes
Website Science Innovation	Yes
Government Science Representation	None
Profit / Non-profit Science Representation	Haiti Development Institute
S&TDC member	Yes
Notes Haiti seems to deploy Science Diplomacy in the broader Boston area. Haiti's Consulate is facilitated with a Science Attaché, but its official website, does not contain any separate tab relevant to Science & Technology but promotes investments and businesses to home country ⁷⁹ . Our research in the newsfeed of the official website of the Haiti's Consulate indicated that Haiti in the greater Boston area organizes visits in universities and companies, build strong networks and bridges among the entrepreneurs and the available venture capital in the Boston Innovation Ecosystem and advertise the competitive strong assets of the home country. We traced the Haiti Development Institute, an organization whose goal is focused more on the humanitarian contribution to the Haiti Government ⁸⁰ . Haiti is member of the S&TDC, but its participation and engagement to the various events are very limited.	

⁷⁹ <http://www.haiti.org/business-diplomacy/>.

⁸⁰ <https://www.hdihaiti.org/>.

Jamaica

Country	Jamaica
Type of Diplomatic Presence	Honorary Consulate
Address	183 State St.
Postal Code	02109
District	Boston, MA
Phone Number	(617) 778-0021
Email	info@jamaicaconsulboston.org
Website	http://www.jamaicaconsulboston.org
Language	English
Science Diplomacy Presence	No
Science Attaché	N/A
Website Science Innovation	N/A
Government Science Representation	N/A
Profit / Non-profit Science Representation	N/A
S&TDC member	No
Notes Jamaica is a country that currently does not deploy any kind of form of Science Diplomacy in the greater Boston area. Therefore, any information regarding the Science Diplomacy is unavailable for now, since even the contact information is incomplete.	

Nicaragua

Country	Nicaragua
Type of Diplomatic Presence	Honorary Consulate
Address	52 Mulberry St.
Postal Code	01105
District	Springfield, MA
Phone Number	(413) 781-5400
Email	N/A
Website	N/A
Language	N/A
Science Diplomacy Presence	No
Science Attaché	N/A
Website Science Innovation	N/A
Government Science Representation	N/A
Profit / Non-profit Science Representation	N/A
S&TDC member	No
Notes Nicaragua is a country that currently does not deploy any kind of form of Science Diplomacy in the greater Boston area. Therefore, any information regarding the Science Diplomacy is unavailable for now, since even the contact information is incomplete.	

Quebec

Country	Quebec - Canada
Type of Diplomatic Presence	Government Office
Address	201 Washington St.
Postal Code	02108
District	Boston, MA
Phone Number	(617) 482-1193
Email	qc.boston@mri.gouv.qc.ca
Website	https://www.international.gouv.qc.ca/en/boston
Language	English, French
Science Diplomacy Presence	Yes
Science Attaché	Yes
Website Science Innovation	No
Government Science Representation	No
Profit / Non-profit Science Representation	No
S&TDC member	Yes
Notes Quebec seems to have a very active role in deploying Science Diplomacy in the broader Boston area. Quebec's Government office is facilitated with Science Attaché, but its official website, does not contain any separate tab relevant to Science & Technology. Our research in the newsfeed of the official website of the Quebec's Government office was limited and indicated that Quebec in the greater Boston area organizes visits in companies deployed in the Boston Innovation Ecosystem. According to the Ittelson's et al. (2019) report, Quebec's main focus is to: • Provide strategic Consulting Services, provide services (legal advice, US hiring, production in compliance with federal regulations) to start-ups • Inform foreign researchers for incentives to pursuit a career in Quebec • Advertise its practices in Boston Innovation Ecosystem to enhance Quebec's image Quebec is one of the first and most active members of the S&TDC, and its participation and engagement is high and continuous.	

Oceania

New Zealand

Country	New Zealand
Type of Diplomatic Presence	Honorary Consulate
Address	57 N Main St.
Postal Code	03302
District	Concord, NH
Phone Number	(603) 225-8228
Email	nzconsulate@preti.com
Website	https://www.mfat.govt.nz/en/countries-and-regions/north-america/united-states-of-america/new-zealand-embassy-washington/contactfull
Language	English
Science Diplomacy Presence	No
Science Attaché	N/A
Website Science Innovation	N/A
Government Science Representation	N/A
Profit / Non-profit Science Representation	N/A
S&TDC member	No
Notes New Zealand is a country that currently does not deploy any kind of form of Science Diplomacy in the greater Boston area. Therefore, any information regarding the Science Diplomacy is unavailable for now.	

South America

Bolivia

Country	Bolivia
Type of Diplomatic Presence	Honorary Consulate
Address	85 Devonshire St.
Postal Code	02109
District	Boston, MA
Phone Number	(617) 227-4481
Email	N/A
Website	N/A
Language	N/A
Science Diplomacy Presence	No
Science Attaché	N/A
Website Science Innovation	N/A
Government Science Representation	N/A
Profit / Non-profit Science Representation	N/A
S&TDC member	No
Notes Bolivia is a country that currently does not deploy any kind of form of Science Diplomacy in the greater Boston area. Therefore, any information regarding the Science Diplomacy is unavailable for now, since even the contact information is incomplete.	

Brazil

Country	Brazil
Type of Diplomatic Presence	Consulate
Address	175 Purchase St.
Postal Code	02110
District	Boston, MA
Phone Number	N/A
Email	contato.boston@itamaraty.gov.br
Website	http://boston.itamaraty.gov.br/pt-br/
Language	English, Spanish
Science Diplomacy Presence	Yes
Science Attaché	Yes
Website Science Innovation	No
Government Science Representation	None
Profit / Non-profit Science Representation	SciBr, Startout Brazil
S&TDC member	No
Notes Our research indicated that Brazil is maintaining an active role in deploying Science Diplomacy in the greater Boston Area. Its Consulate General in Boston facilitates Science Attaché and “in the science, technology and innovation field, the establishment of the country’s major institutions is associated with international cooperation”⁸¹. It seems that there are two organizations contributing to the deployment of Science Diplomacy, the SciBr -build knowledge network as the organization promote and work together with local grassroots groups to connect, mobilize and publicize the Brazilian talent abroad⁸² - and the Startout Brazil – which in the case that “a Brazilian company or citizen is interested in mentoring these startups, they are encouraged to send an e-mail to contato@startoutbrasil.com.br and schedule a conversation with the StartOut Brazil team for further detailing of the mentoring process”⁸³. According to the Ittelson’s et al. (2019) report, Brazil’s main focus is to: • Engage diaspora to guide the policymakers of the home government for socio-economic development • Observe S&T disruptions that may impact with the home research ecosystem by setting domestic and international strategies. Brazil is member of the S&TDC since the mid of 2014, but according to our available data its participation and engagement can be characterized as medium (relevantly to the other country-members).	

⁸¹ <http://www.itamaraty.gov.br/en/science-technology-and-innovation>.

⁸² <https://scibr.org>.

⁸³ <https://www.startoutbrasil.com.br/english/>.

Chile

Country	Chile
Type of Diplomatic Presence	Honorary Consulate
Address	1 Bernardo O'Higgins Circle
Postal Code	02135
District	Brighton, MA
Phone Number	(617) 232-0416
Email	conchile.org@comca.net
Website	https://chile.gob.cl/nueva-york/en/ (site of the consulate in NY)
Language	English, Spanish
Science Diplomacy Presence	Yes
Science Attaché	No
Website Science Innovation	No
Government Science Representation	None
Profit / Non-profit Science Representation	chilemass
S&TDC member	No
Notes Our research indicated a form of Science Diplomacy deployment by Chile. The Chilean Honorary Consulate in Boston is not facilitated with Science Attaché, but there is no further information regarding their actions and practices in the greater Boston Area. The research traced the organization chilemass, which is located in the area of Cambridge and collaborate with the Chilean government in order to “build a bridge of technology and knowledge transfer between Chile and Massachusetts, to promote sustainable development and improve the quality of life of people in both territories.”⁸⁴ However, in order to access the newsfeed website, a subscription to the newsletter is mandatory. However, the “subscription” button after the contact info completion procedure is not working. Chile has not introduced itself to the S&TDC yet according to our available data.	

⁸⁴ <http://chilemass.org>.

Colombia

Country	Colombia
Type of Diplomatic Presence	Consulate
Address	31 Street James Ave
Postal Code	02116
District	Boston, MA
Phone Number	(617) 536-6222
Email	cboston@cancilleria.gov.co
Website	https://boston.consulado.gov.co
Language	Spanish
Science Diplomacy Presence	Yes
Science Attaché	No
Website Science Innovation	No
Government Science Representation	None
Profit / Non-profit Science Representation	None
S&TDC member	Yes
Notes Our research indicated a form of Science Diplomacy deployment by Colombia. The General Colombian Consulate in Boston is not facilitated with Science Attaché, but there is no further information regarding their actions and practices in the greater Boston Area. Moreover, the lack of the English version of the content of the General Colombian Consulate's official website makes even harder the broader audience to get access to their information and makes the newsfeed inaccessible and incomprehensive. Colombia has introduced itself to the S&TDC, as according to our available data it seems that its participation and engagement has started since 2014, and they are really medium (relatively to the other country-members).	

Dominican Republic

Country	Dominican Republic
Type of Diplomatic Presence	Consulate
Address	20 Park Plaza
Postal Code	02116
District	Boston, MA
Phone Number	(617) 482-8121
Email	consdomboston@serex.gov.do
Website	http://www.domrep.org/consulates_us.html
Language	English
Science Diplomacy Presence	No
Science Attaché	N/A
Website Science Innovation	N/A
Government Science Representation	N/A
Profit / Non-profit Science Representation	N/A
S&TDC member	No
Notes Dominican Republic is a country that currently does not deploy any kind of form of Science Diplomacy in the greater Boston area. Therefore, any information regarding the Science Diplomacy is unavailable for now.	

Ecuador

Country	Ecuador
Type of Diplomatic Presence	Honorary Consulate
Address	52 Cranberry Ln
Postal Code	02492
District	Needham, MA
Phone Number	(914) 837-5681 / (781) 400-1212
Email	ecuadorconsulateboston@comcast.net
Website	N/A
Language	N/A
Science Diplomacy Presence	No
Science Attaché	N/A
Website Science Innovation	N/A
Government Science Representation	N/A
Profit / Non-profit Science Representation	N/A
S&TDC member	No
Notes Ecuador is a country that currently does not deploy any kind of form of Science Diplomacy in the greater Boston area. Therefore, any information regarding the Science Diplomacy is unavailable for now, since even the contact information is incomplete.	

Guatemala

Country	Guatemala
Type of Diplomatic Presence	Honorary Consulate
Address	754 Branch Ave
Postal Code	02904
District	Providence, RI
Phone Number	(401) 270-6345
Email	N/A
Website	N/A
Language	N/A
Science Diplomacy Presence	No
Science Attaché	N/A
Website Science Innovation	N/A
Government Science Representation	N/A
Profit / Non-profit Science Representation	N/A
S&TDC member	No
Notes Guatemala is a country that currently does not deploy any kind of form of Science Diplomacy in the greater Boston area. Therefore, any information regarding the Science Diplomacy is unavailable for now, since even the contact information is incomplete.	

Mexico

Country	Mexico
Type of Diplomatic Presence	Consulate
Address	55 Franklin St.
Postal Code	02110
District	Boston, MA
Phone Number	(617) 426-4181
Email	N/A – Inquiry Form
Website	https://consulmex.sre.gob.mx/boston/index.php
Language	Spanish
Science Diplomacy Presence	Yes
Science Attaché	Yes
Website Science Innovation	Yes
Government Science Representation	None
Profit / Non-profit Science Representation	None
S&TDC member	Yes
Notes Our research indicated a form of Science Diplomacy deployment by Mexico. The General Mexican Consulate in Boston is facilitated with Science Attaché, but there is no further information regarding their actions and practices in the greater Boston Area.⁸⁵ Moreover, the lack of the English version of the content of the General Mexican Consulate’s official website makes even harder the broader audience to get access to their information and makes the newsfeed inaccessible and incomprehensible. According to the Ittelson’s et al. (2019) report, Quebec’s main focus is to: • Observe S&T disruptions that may impact with the home research ecosystem by setting domestic and international strategies • Track the innovation trends in the STI startup sphere • Search for US researchers for advisory purposes and academic positions to trigger academic collaborations (air quality) • Observe STI practices and policies deployed in Boston to replicate and consequently deploy them back in Mexico Mexico is one of the first and most active members of the S&TDC, and its participation and engagement is high and continuous.	

⁸⁵ <https://consulmex.sre.gob.mx/boston/index.php/culturales/por-que-invertir-en-mexico-investing-in-mexico>. Promotes the investments in home country. However, the website is in Spanish, therefore being inaccessible for the non-speaking Spanish audience.

Peru

Country	Peru
Type of Diplomatic Presence	Consulate
Address	20 Park Plaza
Postal Code	02116
District	Boston, MA
Phone Number	(617) 338-2190 / -2227
Email	consuladogeneral@conperboston.com
Website	http://www.consulado.pe/es/Boston/Paginas/Inicio.aspx
Language	Spanish
Science Diplomacy Presence	No
Science Attaché	N/A
Website Science Innovation	N/A
Government Science Representation	N/A
Profit / Non-profit Science Representation	N/A
S&TDC member	No
Notes Peru is a country that currently does not deploy any kind of form of Science Diplomacy in the greater Boston area. Therefore, any information regarding the Science Diplomacy is unavailable for now. Moreover, the lack of the English version of the content of the General Peruvian Consulate's official website makes even harder the broader audience to get access to their information.	

Venezuela

Country	Venezuela
Type of Diplomatic Presence	Consulate
Address	545 Boylston St.
Postal Code	02116
District	Boston, MA
Phone Number	(617) 266-9368 / -9475
Email	consulado@boston.embavenez-us.org
Website	https://web.archive.org/web/20140927094748/http://www.embavenez-us.org/_boston/
Language	English, Spanish
Science Diplomacy Presence	No
Science Attaché	N/A
Website Science Innovation	N/A
Government Science Representation	N/A
Profit / Non-profit Science Representation	N/A
S&TDC member	No
Notes Venezuela is a country that currently does not deploy any kind of form of Science Diplomacy in the greater Boston area. Therefore, any information regarding the Science Diplomacy is unavailable for now.	

Discussion

Current Dynamics and Existing Gaps of the Boston Innovation Ecosystem

One observation that our research brought up to the surface is that there is no specific number of the existing diplomatic representations in the greater Boston area. At the beginning of our research, we noticed that both the Ittelson's et. al (2019) report and the official website of the S&TDC were highlighting the fact that more than 65+ diplomatic missions are located in the greater Boston area. At the end of our research, we traced that the official S&TDC's website was referring that the S&TDC is an organization with members of more than 50+ diplomatic missions and affiliated associations in the Boston area. We tracked 67 active diplomatic missions in the greater Boston area and 19 affiliated organizations that their primary goal is to apply Science Diplomacy practices. That number is getting even bigger in the case we add the governments that despite they do not have currently any diplomatic mission in the greater Boston area, they pursuit to remain connected with the Boston Innovation Hub (**Table 6**).

The current research contributed us to obtain a better and deeper understanding of the Boston Innovation Ecosystem and qualified us with tools and information in order to be able to answer the questions that we set during the Introduction (*Our Questions*). Starting with the question of *"Are there any gaps in the procedure of Science Diplomacy deployment that can be filled?"*. Despite the high density and capacity of the diplomatic representations (66 diplomatic representations, including Consulates, Honorary Consulates & Government Representative Offices) and despite the extensive use of the internet, almost only half of them have a complete informed website with or in any other online database an available contact phone number, physical address and e-mail address ()). The contact information is an integral part for all the interested members that want to be part of the greater Boston Innovation Hub. The public domain is one of the most accessible ways to bring the international community together. In addition to that, we noticed that for some countries even the language imposes barriers. Boston hosts numerous international not only students but also researchers and entrepreneurs. The inclusive element that Science Diplomacy hints is limited when parts of the community lack the skill of the foreign languages.

The interpretation of our research contributed us to obtain a better and deeper understanding of the Boston Innovation Ecosystem. Despite the high density and capacity of the diplomatic representations (66 diplomatic representations, including Consulates, Honorary Consulates & Government Representative Offices) and despite the extensive use of the internet, almost only half of them have a complete informed website with or in any other online database an available contact phone number, an existing address and e-mail address (**Figures 5a-e**). The contact information (**Figure 5a**: 37 out of 67 Consulates in Boston have updated contact information) is an integral part for all the interested members that want to be part of the greater Boston Innovation Hub. According to **Figure 5b** we were able to trace and track only 43 out 67 Consulates in Boston which have official websites. The public domain is one of the most accessible ways to bring the international community together. In addition to that, we noticed that for some countries even

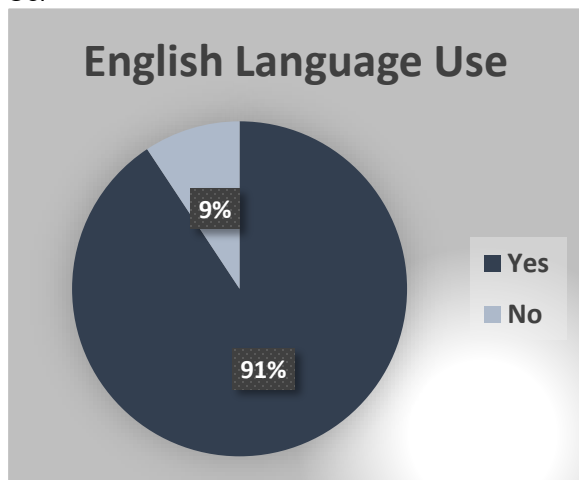
5a.



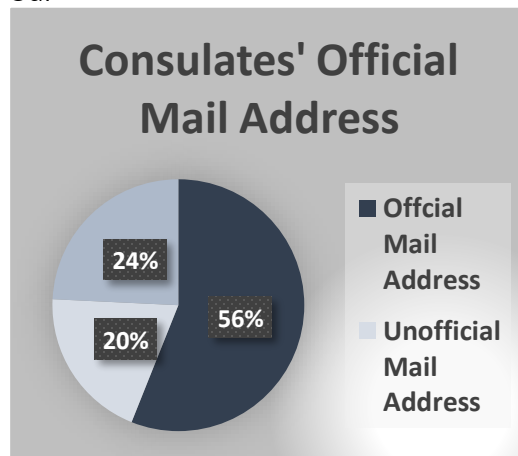
5b.



5c.



5d.



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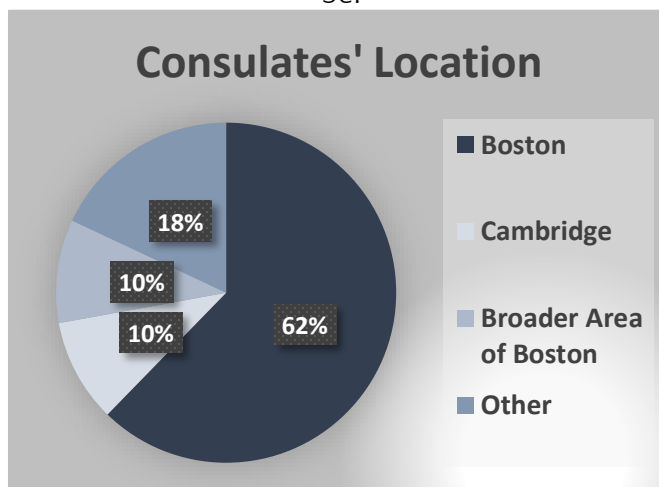


Figure 5: Characteristics of the Diplomatic Representations in the Boston Innovation Ecosystem.

Figure 5a: 34 out of 67 Consulates in Boston have a fully updated website-contact information (full address, phone number, mail address and official website).

Figure 5b: Of the 67 only 43 diplomatic missions in Boston have official websites.

Figure 5c: Of the 43 Consulates that have official website only 4 of them do not make use of the English language, making it difficult for the interested public to find further information about the consular services that this nation provides.

Figure 5d: Of the 67 only 37 diplomatic missions in Boston have official mail address that the public can reach out for further information, hence 16 have no available mail address and the remaining have mail addresses assigned to specific employees.

Figure 5e: 38 diplomatic missions are located in Boston, 6 located in Cambridge, at the heart of the renowned universities, 6 at the broader area of Boston and 11 in the broader area of Massachusetts.

the language imposes barriers. **Figure 5c** indicates that there are still diplomatic representations that do not integrate the English version of their website. Of the 43 Consulates that have official website only 4 of them do not make use of the English language, making it difficult for the interested public to find further information about the consular services that this nation provides. Boston hosts numerous international not only students but also researchers and entrepreneurs.

The analysis of the contact information indicated that almost a quarter of the consulates in the greater Boston area have assigned their official e-mail addresses to specific employees. The **Figure 5d** shows us 37 out of 67 Consulates in Boston have official mail address that the public can reach out for further information, hence 16 have no available mail address and the remaining have mail addresses assigned to specific employees. Therefore, in the case of personnel transfer, the network and the bridges of communication will be lost, jeopardizing the effectiveness of the goal of science diplomatic.

Science Diplomacy in the Science & Technology Diplomatic Circles

Current dynamics of the Science Diplomacy

Trying to compare the Ittelson's et al (2019) report results and the results that we gathered during our research, taking as granted that only those countries that are referring to the specialization section were deploying a form of Science Diplomacy in the Boston Innovation Ecosystem, we can easily conclude that the dynamics in the greater Boston area have changed and continue to change rapidly.

The interpretation of the Ittelson's et al (2019) report led us to the conclusion that only 14 countries seemed to deploy Science Diplomacy when the report was published. Till 2020 and with the publicly available information, we concluded that another 21 countries were added to the group of countries that interact with the Boston Innovation Ecosystem (**Table 5**). Including the location and their main focus according to their organized events, we summarized the primary goals of each diplomatic representation and their interests are focused on the promotion of the business and investment market in the home country (9 out of 35), building research collaborations mainly on bio-tech and -science (11 out of 35) by bringing together the research and academic community and providing financial and consulting services to entrepreneurs that seek to expand their markets to New England (7 out of 35).

The structured practices that the countries have developed to create governance mechanisms and built infrastructures follow in general, but more enriched, the pattern that S&TDC deploy in the Boston Innovation Ecosystem. The density and the variety of the events depends on the needs and the goals of each country. The majority of the events are company visits, either from home country or well-established companies or entrepreneurs share their insights of the Boston market. The fact that the visits to accelerators or incubators and the multiple level of collaborations with domestic key actors come second highlights that countries by deploying Science Diplomacy aims to the economic development and the advertisement of the local capabilities of the entrepreneurs and the market. However, many countries organize network events and university visits to connect researchers from the home country and the New England academic institutions for international collaborations, working on common problems and issues of our time, such as water scarcity, renewable energy etc. Moreover, the countries are trying to adjust the events and the information sessions with the new technological trends that first are generated and applied in Boston, such as swissnex lately organized multiple events regarding the drones.

A/A	Name	City	Focus
1	Austria	Boston	*Deploy academic partnerships in biotech *Help to establish research collaborations *Advertise and promote businesses in Austria
2	Belgium	Cambridge	*Help to establish research collaborations *Advertise and promote businesses and investments in Belgium
3	Brazil	Boston	*Engage diaspora to guide the policymakers of the home government for socio-economic development *Observe S&T disruptions that may impact with the home research ecosystem by setting domestic and international strategies <i>*Build knowledge network bridges among Brazil and New England</i>
4	Bulgaria	Newton	*Promote the Bulgarian business environment to persuade Boston-based to expand their footprint in Bulgaria *Partner with US universities to file joint-research grants in Bulgaria <i>* No additional information available</i>
5	Canada	Boston	*Consulting services for start-ups to penetrate US STI markets *Inform foreign researchers for incentives to pursuit a career in Canada *Observe STI practices and policies deployed in Boston to replicate and consequently deploy them back in Canada <i>* No additional information available</i>

6	Chile	Brighton	*Build a bridge of technology and knowledge transfer between Chile and Massachusetts *Promote sustainable development *Collaborations to improve the quality of life of people in both territories *Specializes on Energy, Technology, Education & Economic Development
7	Czech Republic	Wellesley	No Available data
8	Denmark	Cambridge	*Consulting services for start-ups to penetrate US STI markets *Look for research collaborations in clinical research and other life science areas *Fellowship agreement with MIT for PhDs & PostDocs *Matches MIT students with Danish research institutions and companies for internships <i>*Build knowledge network bridges among Denmark and New England regarding the health sector</i>
9	Egypt	-	*Help to establish research collaborations regarding Egypt's issues such as water desalination & renewable energy
10	Finland	Boston	*Promote the Finnish business environment to persuade Boston-based to expand their footprint in Finland * Provide market opportunities, advice (consulting services), training and financing services etc.
11	France	Boston	*Advertise and promote businesses in France *Advertise and promote R&D opportunities in France *Communicate and advocate public policy for their S&T objectives to Boston Innovation Ecosystem (climate change)
12	Germany	Boston	*Advertise and promote R&D opportunities in Germany *Promote the German interests in technology, science and research in New England
13	Greece	Boston	*Promote the Greek business and investment environment to Greece *Educate the Greek diaspora about Greek startup activity *Provide Greek startups the opportunity to pitch and network within the well-developed Boston startup ecosystem *Empower startups from Greece and Cyprus ("Greek startups") with a bridge to the U.S. through pitching and networking opportunities.
14	Haiti	Boston	*Promote the Haitian business and investment environment to Haiti
15	Ireland	Boston	*Promote the Irish business and investment environment to Ireland *Provide a wide range of services to promote FDI into Ireland *Help to establish and expand existing investors their operations in Ireland

16	Israel	Boston	*Deploy academic partnerships and training in the cybersecurity domain *Observe STI practices and policies deployed in Boston to replicate and consequently deploy them back in Israel *<i>Fund raising - venture capitals collaboration</i>
17	Italy	Boston	*Build networking bridges for students, researchers, professors and Italian entrepreneurs in New England *Promote the Italian business and investment environment to Italy
18	Japan	Boston	*Promote Japanese researchers to contribute Science and Technology in New England
19	Liechtenstein	Dedham	No Available data
20	Lithuania	Salem	No Available data
21	Mexico	Boston	*Observe S&T disruptions that may impact with the home research ecosystem by setting domestic and international strategies *Track the innovation trends in the STI startup sphere *Search for US researchers for advisory purposes and academic positions to trigger academic collaborations (air quality) *Observe STI practices and policies deployed in Boston to replicate and consequently deploy them back in Mexico * <i>No additional information available</i>
22	Monaco	Cambridge	*Promote public policy to communicate and advocate their S&T policy objectives to Boston Innovation Ecosystem * <i>No additional information available</i>
23	Netherlands	Boston	*Track the innovation trends in the STI startup sphere *Increase connections with the Boston STI ecosystem on regenerative research *<i>Promote international collaboration in the life sciences</i> *<i>Build strong network bridges among Netherlands and New England</i>
24	Poland	Cohasset	*Expand the scientific horizons of Poland *Establish personal and professional connections with New England
25	Portugal	Boston	No Available data
26	Quebec	Boston	*Provide strategic Consulting Services, provide services (legal advice, US hiring, production in compliance with federal regulations) to start-ups *Inform foreign researchers for incentives to pursue a career in Quebec *Advertise its practices in Boston Innovation Ecosystem to enhance Quebec's image * <i>No additional information available</i>

27	South Korea	Newton	*Build networking bridges *Promote collaborations in biotech *Exchange information on their own projects and current situation and sought for the way to improve reciprocal cooperation, Robot Enterprise Promotion Association etc. *Emphasize the innovative aspects of Boston, and pledge to contribute to the build-up of a bio eco-system for companies in Korea and the United States. <i>*Promote international collaboration in the life sciences</i> <i>*Build strong network bridges among Netherlands and New England</i>
28	Spain	Boston	No Available data
29	Sweden	Boston	*Accelerate trade, commerce, investment relationships, *Support Swedish businesses and individuals succeed in the US market *Highlight entrepreneurial, innovative and educational initiatives between Sweden the US
30	Switzerland	Cambridge	*Observe STI practices and policies deployed in Boston to replicate and consequently deploy them back in Switzerland *Collaborate with Red Cross Collaborative Platform for the application of STI to humanitarian work <i>*Inform about the venture leaders in the life sciences in Boston</i>
31	Taiwan	Boston	*Help students exchange program with US universities *Engage diaspora to guide the policymakers of the home government for socio-economic development <i>*Build strong network bridges among Netherlands and New England</i> <i>*Help start-ups by fund raising in conferences</i> <i>*Promote collaborations with other diplomatic representations</i>
32	Thailand	Boston	No Available data
33	Turkey	Boston	No Available data
34	United Arab Emirates	Boston	No Available data
35	United Kingdom	Cambridge	*Bring together for collaboration local (Boston) & UK Institutions *Specialize on societal issues (gender gap in Science, technology, Engineering & Mathematics) *Negotiate and implement S&T agreements <i>* No additional information available</i>

Table 5: Specialization of each country that deploys Science Diplomacy in Boston Innovation Ecosystem.

Integration of Science Diplomacy in the Boston Innovation Ecosystem

By answering the previous question, what come next to our mind is *“How can countries contribute to Boston Innovation Ecosystem?”*, we would suggest that countries that preserve a diplomatic presence in the broader Boston region may share more information, whether we are referring to the contact information or the news regarding the types of the events and their achievements. Our research brought to the surface the limited information from some countries regarding their activities in the Boston Innovation Ecosystem. Since our research was based on the publicly available information in the public domain, we found out that for some countries the tracing and tracking information of the deployment of Science Diplomacy was very limited and therefore added barriers and constraints in being inclusive, international and interdisciplinary. By sharing the types of the events and the achievements of the countries through the Science Diplomacy, the governments will be the bright example for the rest of the world to imitate and eventually to contribute the international community. By sharing their experiences and insights, the countries that currently deploy Science Diplomacy in the Boston Innovation Ecosystem can guide and provide leadership to the rest countries that are currently making their infants steps to this unknown field or consider starting the deployment of Science Diplomacy whether in Boston or in any global city in the world.

One term that seems to be an accelerating factor of the high engagement of the diplomatic representation is the location of the diplomatic representations (**Figure 6 & Figure 7**). 38 Consulates are located in Boston, 6 located in Cambridge, at the heart of the renowned universities, 6 at the broader area of Boston and 11 in the broader area of Massachusetts. We noticed that the diplomatic representations that are located close at the region of Cambridge, where the renowned academic institutions and the greatest research community are, are the countries with the most active presence regarding the deployment of Science Diplomacy in the Boston Innovation Ecosystem. However, this is not an inhibitory factor for those that are located in other neighborhoods. This can give them room to advance collaborations and synergies with other parts and actors of the Boston Innovation Ecosystem, such as private companies and incubators/ accelerators. Most of the diplomatic representations are located in the North End and Back Bay area where most of the consulting firms⁸⁶ and the investing companies⁸⁷ have their offices. Therefore, taking advantage their location, the diplomatic representations can build bridges and networks among the home country's entrepreneurs and the Boston Innovation market. Just to consider that Science Diplomacy is deployed in the Boston Innovation Ecosystem even by countries that do not have any diplomatic presence in the broader region (**Table 6**). These countries seem to participate in the various events organized by S&TDC, recognizing the holistic approach of the Boston Innovation Hub and the S&TDC practices and policies.

⁸⁶ <https://www.google.com/maps/search/consulting+firms+in+Boston/@42.3565728,-71.0794356,14.17z>.

⁸⁷ <https://www.google.com/maps/search/accelerators+in+Boston/@42.3613101,-71.1029222,13z>.

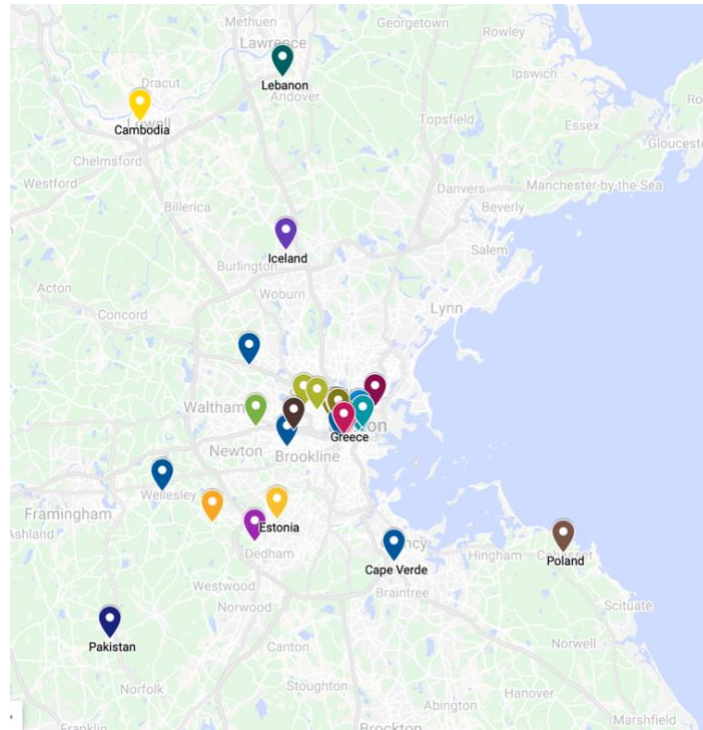


Figure 6: Map of the location of the 67 Consulates in the greater Boston area (Scale 2mi).

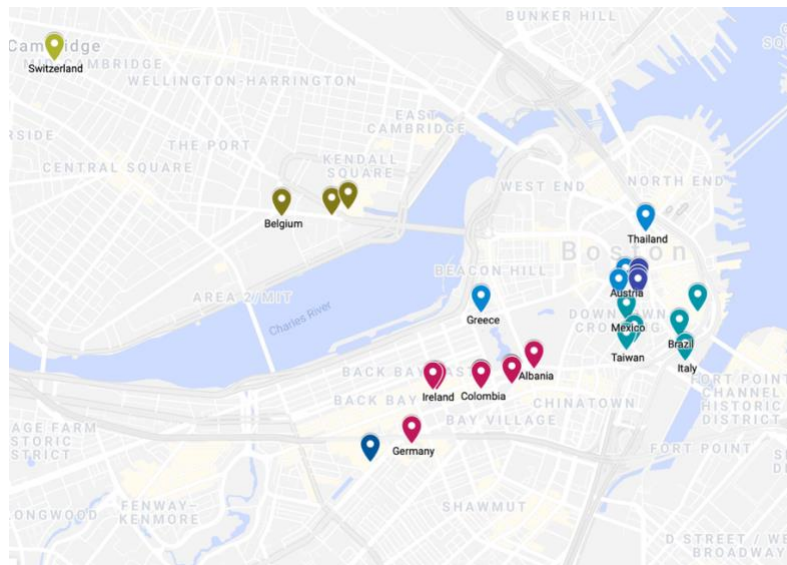


Figure 7: Map of the location of the 67 Consulates in the greater Boston area (Scale 2000ft).

Interactions of the Diplomatic Representations with the Boston Innovation Ecosystem

The majority of the governments with diplomatic representations in Boston are willing to build bridges and infrastructures among the home countries and the Boston Innovation Ecosystem by introducing the research community to the local academic institutions and companies that have as main goal to solve problems of worldwide concern. After identifying and tracing the Science Diplomatic presence of the various countries in Boston area and having as a guiding light the report

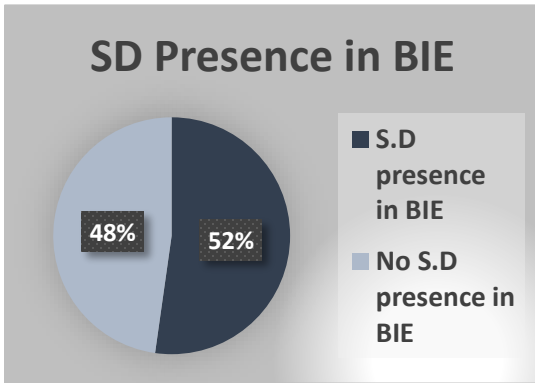
by Ittelson et al. 2019 “How countries can interact with Boston Innovation Ecosystem”, we concluded that of the countries that preserve a diplomatic representation in the greater Boston area almost half (35 out of 67, **Figure 8a**) of those develop multiple practices of Science Diplomacy, such as by deploying a science attaché (science diplomat – 18 out of 35 countries that deploy Science Diplomacy) (**Figure 8b**) in order to inform officially the general consul or the government for scientific and technical matters, scientific and technological events and represent his/her country to foreign scientific or technical academies, industries or intergovernmental events and organization and promoting their actions and practices in a unique link in their official websites (**Figure 8e** – only 16 out of 35 countries that deploy Science Diplomacy have a separate science-innovation tab at their MFA official websites).

Countries have chosen to implement various ways to develop practices of Science Diplomacy. Only 9 (out of 35 countries that deploy Science Diplomacy) have established an official collaboration with home governments, such as the Ministries of Economic Development, Research, Education etc., such as Canada, Switzerland etc. (**Figure 8c**) since the rest governments (19 out of 35 countries that deploy Science Diplomacy) have established collaborations with profit/ not-profit organizations (**Figure 8d**), such as Austria, Brazil, Chile etc., in order to build networks and scientific and technological bridges. The countries that do not practice any form of Science Diplomacy or those that are not satisfied with the outcome of the current practices can audit this existing activity in the landscape, adjust the multilevel variables of the ecosystem, such as the understanding of the national and common interests of the government and the partners, and deploy a similar, hybrid or completely new model of Science Diplomacy in the region.

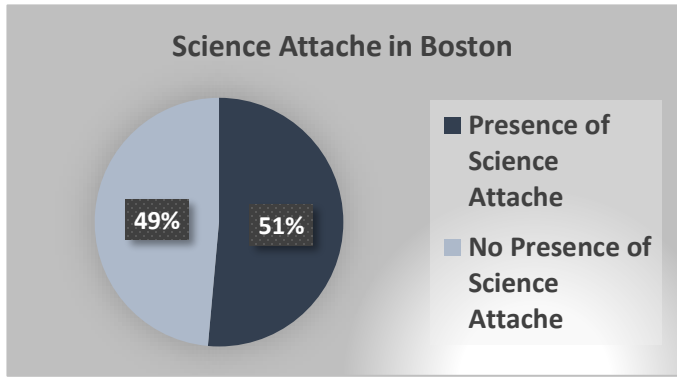
Leadership in an Innovation Ecosystem

Even sharing the dynamics and attributes of the different locations and neighborhoods, the main focus of each country and how these characteristics have already affected their practices, countries can provide leadership in the Innovation Ecosystem. And here comes our next question “*How to provide leadership in an Innovation Ecosystem?*”. Look at what the others are doing and audit the activity in the current landscape. By writing down in a format of index the activity of each country, the form and the organizations that are involved into the deployment of Science Diplomacy, we prepared an audition of the existing activity of the current landscape. By understanding exactly what the main focus of each country and the interests or right balance among the national and common interests are, the governments can deploy the rightful and appropriate partners in order to take from and offer to the most in the Boston Innovation Ecosystem.

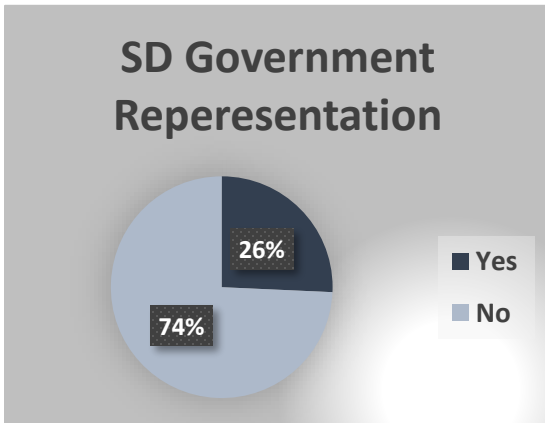
8a.



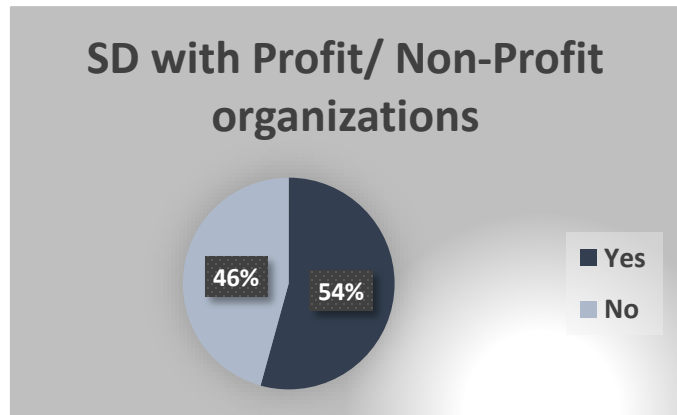
8b.



8c.



8d.



8e.

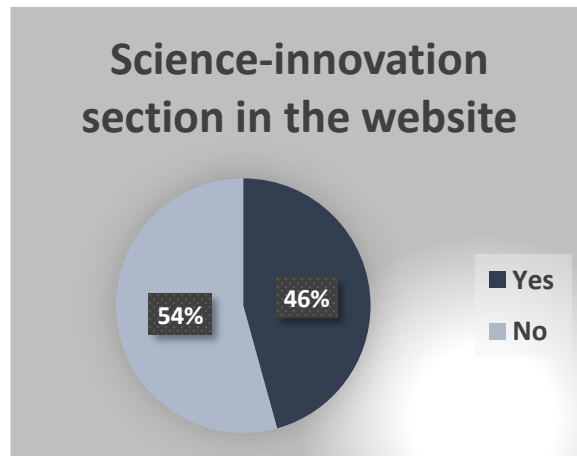


Figure 8: Characteristics of the countries that deploy Science Diplomacy in the Boston Innovation Ecosystem.

Figure 8a: BIE- Boston Innovation Ecosystem, SD- Science Diplomacy. 35 out of 67 diplomatic representations in Boston deploy science diplomacy as a foreign policy for their nation in Boston Innovation Ecosystem.

Figure 8b: Of the 35 diplomatic representations 18 have assigned a Science Attaché.

Figure 8c: SD- Science Diplomacy. Of the 35 diplomatic representations with scientific diplomatic presence only 9 develop Science Diplomacy in collaboration with the Ministry of Foreign Affairs or other Ministries, such as Economic Affairs, Education, Science & Technology and Economy.

Figure 8d: SD- Science Diplomacy. Of the 35 diplomatic representations with scientific diplomatic presence 19 of them collaborate with either profit or non-profit organizations in order to implement Science Diplomacy in Boston Innovation Ecosystem

Figure 8e: Of the 35 diplomatic representations with scientific diplomatic presence 16 have a separate science-innovation tab at their MFA official websites.

The high interest of the EU (aka S4D4C), as we aforementioned in the Introduction can be justified by the fact that of the 33 European countries that have a diplomatic presence the 23 (**Figure 9Figure 9**), the highest percentage of all continents, of them develop multiple levels of Science Diplomacy in the Boston Innovation Ecosystem, following the pattern of the distribution of the diplomatic presence . The EU has recognized the national interests as common interests, either for unified address of the global issues or for economic development of each country, with integrative leadership through a series of structured practices through Science, Technology, Innovation and Foreign policy⁸⁸. South America and Asia come next, but the argument of the limited diplomatic presence can easily collapse, since countries (**Table 6**) that do not preserve any diplomatic representation in the broader region, they still try to build bridges and networks within the Boston innovation Ecosystem, as we have already mentioned previously. We have to mention in this point that according to the Langenhove's study (2017) the majority of the EU Member States do not have a Science Diplomacy strategy. On the other hand, the EU States are deploying types of

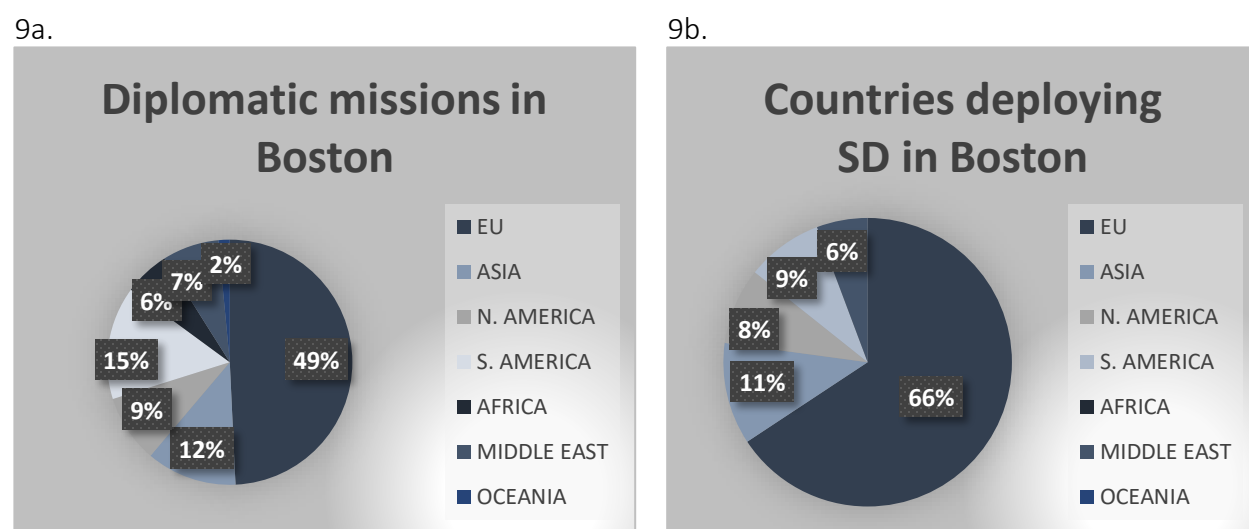


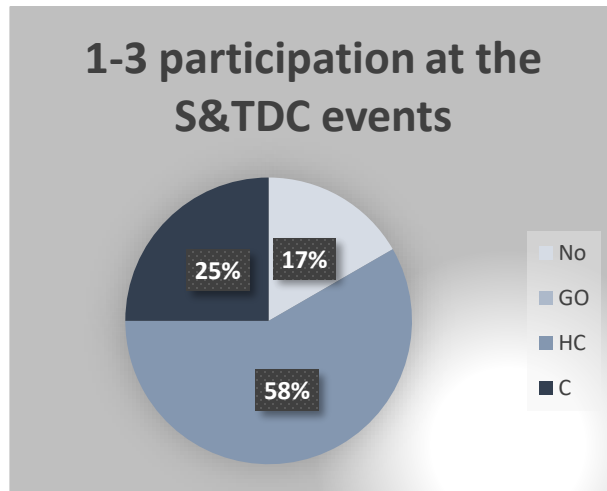
Figure 9: Continental categorization of the Countries with Diplomatic Representation in the Boston Innovation Ecosystem.

Figure 9a: Distribution of countries with diplomatic mission in Boston according to their continent.

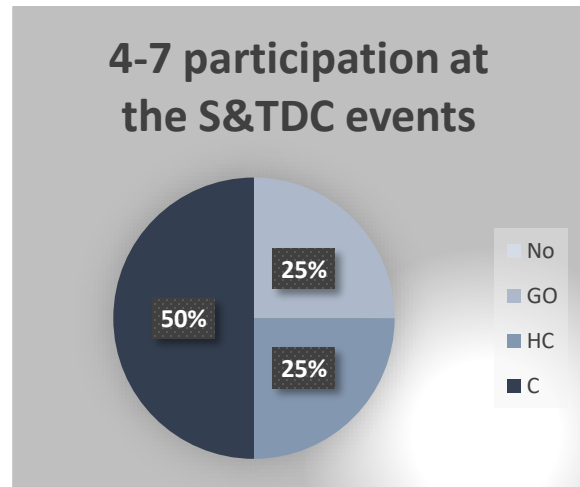
Figure 9b: Distribution of countries that deploy practices of Science Diplomacy in Boston according to their continent.

⁸⁸ Lorenzo Melchor, Ana Elorza, and Izaskun Lacunza. 2020. Calling for a Systemic Change: Towards a EU Science Diplomacy for Addressing Global Challenges. V 1.0. S4D4C Policy Report, Madrid: S4D4C. Available on: <https://www.s4d4c.eu/wp-content/uploads/2020/05/S4D4C-Calling-for-a-Systemic-Change-Policy-Report-v1.0.pdf>.

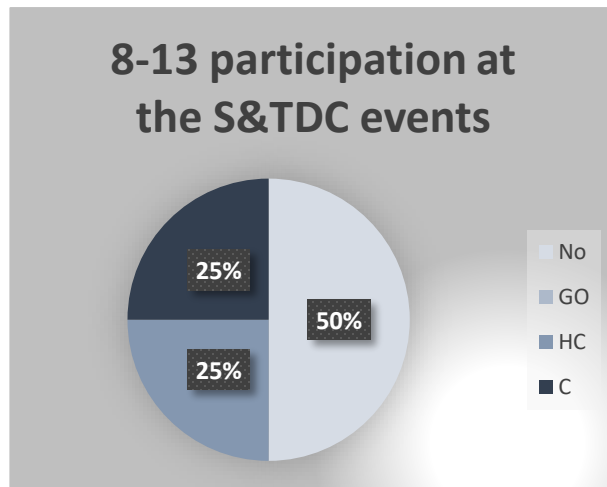
10a.



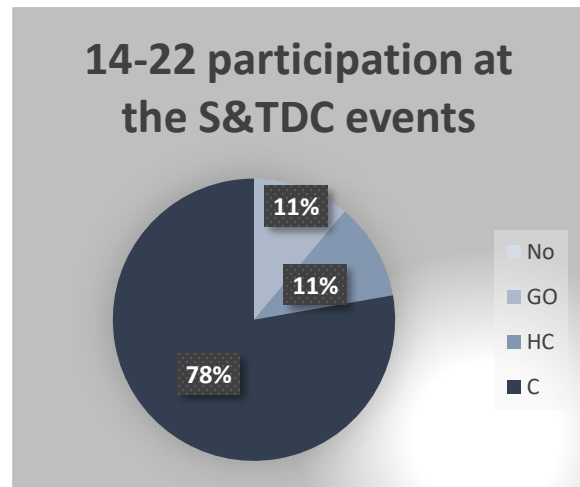
10b.



10c.



10d.



10e.

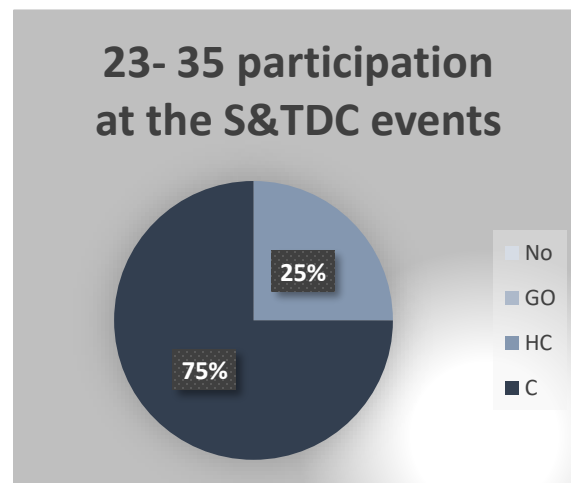


Figure 10: Participation of the countries that are members of the S&TDC. **No:** No diplomatic mission in Boston. **GO:** Government Office, **HC:** Honorary Consulate, **C:** Consulate.

Figure 10a: Distribution of the various categories of diplomatic mission in Boston that participated in 1-3 events, organized by the S&TDC. We considered the participation *RARE*.

Figure 10b: Distribution of the various categories of diplomatic mission in Boston that participated in 1-3 events, organized by the S&TDC. We considered the participation *LOW*.

Figure 10c: Distribution of the various categories of diplomatic mission in Boston that participated in 1-3 events, organized by the S&TDC. We considered the participation *MEDIUM*.

Figure 10d: Distribution of the various categories of diplomatic mission in Boston that participated in 1-3 events, organized by the S&TDC. We considered the participation *HIGH*.

Figure 10e: Distribution of the various categories of diplomatic mission in Boston that participated in 23-35 events, organized by the S&TDC. We considered the participation *VERY HIGH*.

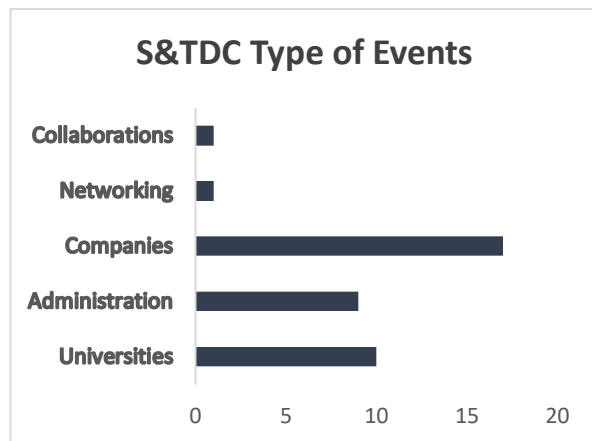
activities that can be categorized as Science Diplomacy practices but with little support structures and mainly connected to Foreign Affairs policies⁸⁹. Generally, the EU has advanced and deployed a comprehensive “international S&T cooperation policy over the past decades” and specifically in 2008 the EU adopted the “Strategic European Framework for International Science and Technology cooperation” and the “Strategic Forum for International S&T Cooperation (SFIC), Langenhove (2017).

Analyzing and recognizing the tremendous contribution of Science and Technology Diplomatic Circles in the Boston Innovation Ecosystem, we concluded that main focus of S&TDC is to be inclusive and interdisciplinary, in order to provide leadership and contribute to the various countries’ attempt to deploy Science Diplomacy in Boston. In its events, many diplomatic representations, such as the Australian and Chinese, have attended events accordingly to their needs. However, we noticed that most of the countries have participated either rarely, less than 7 events in total (20 out 35) (**Figure 10a-b**) or highly/very highly (13 out 35) (**Figure 10d-e**). The different types of the diplomatic representations are none (e.g. Australia), Governmental Office – GO (e.g. Quebec), Honorary Consulates (e.g. Denmark) and Consulates (e.g. Switzerland). Therefore, S&TDC may include and enrich more its program with the types of the event that the countries with medium or lower participation will be more interested to engage. Maybe a survey can indicate the main focus of the governments.

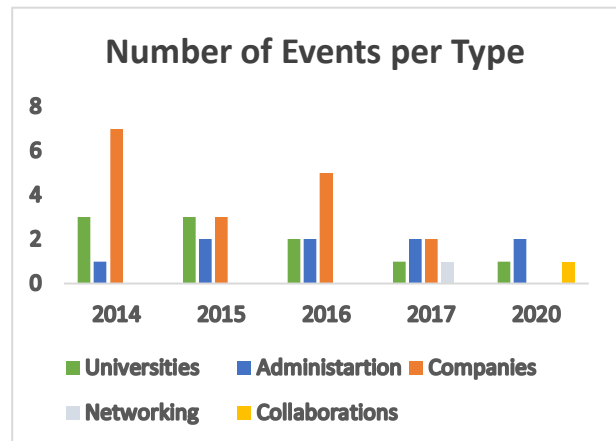
The majority of the events (**Figure 11a**) that S&TDC organized during the years 2014-2017 were visits to renowned companies (17 out of 38 events). The events for arranging administrative subjects and visits to universities, such as Harvard & MIT, for the same period were almost 10 out of 38 (for each of the two aforementioned categories). The histogram of the **Figure 11b**, using the color-code as we mentioned during the methodology section, indicates the number of events organized by S&TDC from 2014-2017 and 2020. We can easily notice that the company visits were more regular in 2014 and dropped significantly in 2017. Specifically, in 2020 due to COVID-19, S&TDC didn’t organize any visits to companies. However, the online meetings and webinars would compensate this drop. Moreover, the global pandemic was the reason for a new type of events, collaborations among nations, in order to discuss the pan-national issues, since they are common national interests. The administration events are stable but there is room for enriching the subjects for discussion. Last but not least, the networking events may be reduced due to the difficulties that are imposed because of the pandemic and the current travel restrictions. Though, new solutions and ways of interaction can open the way for the next era of globalization. We can watch the changes of the type of events through the years in the **Figure 11b**. Even the type of the

⁸⁹ Van Langenhove, Luk. "Tools for an EU Science Diplomacy." Publications Office of the European Union, Brussels, 34p (2017), page 5 & 10.

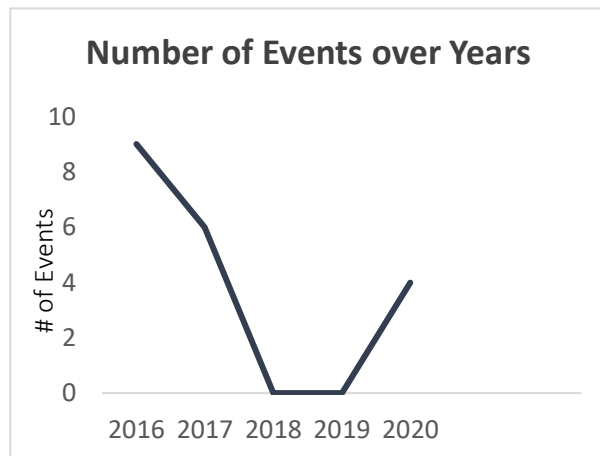
11a.



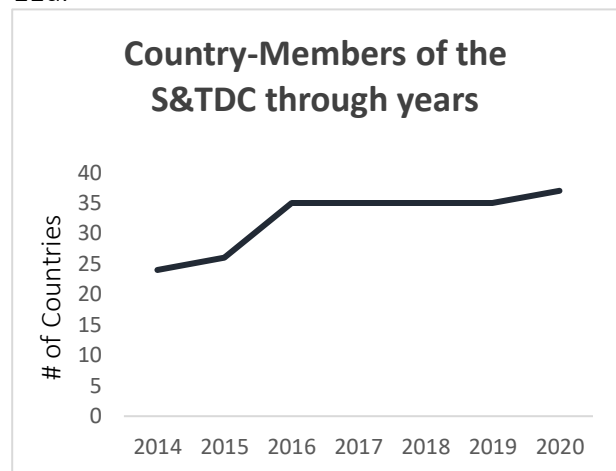
11b.



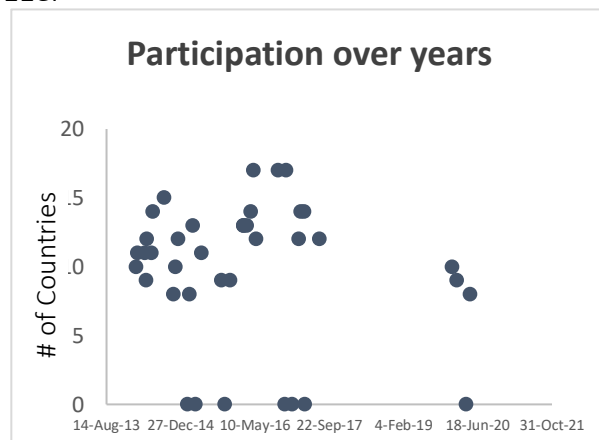
11c.



11d.



11e.



11f.

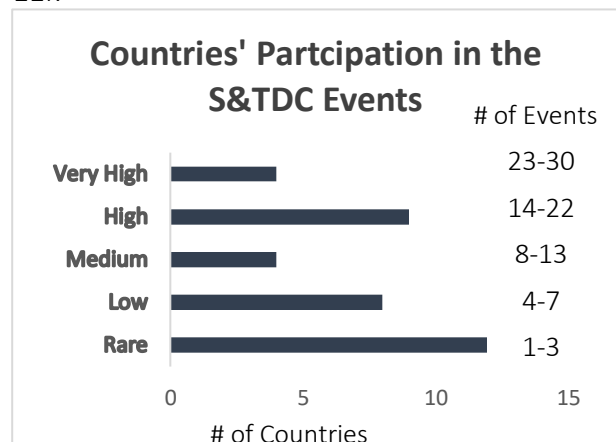


Figure 11: Characteristics of the events organized by the S&TDC.

Figure 11a: The majority of the events that S&TDC organized during the years 2014-2017 were visits to renowned companies (17 out of 38 events). The events for arranging administrative subjects and visits to universities, such as Harvard & MIT, for the same period were almost 10 out of 38 (for each of the two

aforementioned categories). The y-axis indicates the various categories of the events and the x-axis the total number for the period 2014-2017.

Figure 11b: The histogram, using the color-code as we mentioned during the methodology section, indicates the number of events organized by S&TDC from 2014-2017 and 2020. We can easily notice that the company visits were more regular in 2014 and dropped significantly in 2017. Specifically, in 2020 due to COVID-19, S&TDC didn't organize any visits to companies. However, the online meetings and webinars would compensate this drop. Moreover, the global pandemic was the reason for a new type of events, collaborations among nations, in order to discuss the pan-national issues, since they are common national interests. The administration events are stable but there is room for enriching the subjects for discussion. Last but not least, the networking events may be reduced due to the difficulties that are imposed because of the pandemic and the current travel restrictions. Though, new solutions and ways of interaction can open the way for the next era of globalization. The y-axis indicates the total number of events for the period 2014-2017.

Figure 11c: The graph indicates the total number of events organized by S&TDC across the period 2014-2017. Despite the fact that we do not have any publicly available data for the years 2018-2019 and we are still in the middle of 2020, we noticed that the average number of events is around 8 per year (lowest 6 and highest 10). Furthermore, even though the outbreak of COVID-19, S&TDC continued to organize virtual meetings, even visits to universities (In June S&TDC has organized a "Virtual Visit to MIT Center for Transport and Logistics"). The y-axis indicates the total number of events for the period 2014-2017.

Figure 11d: The figure indicates the total number of country members of the S&TDC and how it was increased over the years. Every year there are new added members. The y-axis indicates the number of countries that joined the S&TDC association.

Figure 11e: The dots of the graph indicate the number of the countries that participated in the various events during the period 2014-2017 and how it changed over the years. The y-axis shows the number of the countries that participated in the events.

Figure 11f: The countries' participation in the events that S&TDC organized varies. Considering the categorization of the participation as 1-3 events: *Rare*, 4-7 events: *Low*, 8-13 events: *Medium*, 14-22 events: *High* and 23-30 events: *Very High*, we concluded that the majority of the countries with diplomatic representation has low or rare participation in the events (20 out of 37 countries). The left y-axis displays the characterization of the participation, hence the right y-axis explains the aforementioned categorization. The x-axis displays the number of countries that belong to each category.

diplomatic representation does not seem to have significance on the countries' participation (even to consider those countries that do not deploy any diplomatic presence in the broader region). On the other hand, regarding the participation, we noticed that during the years of 2016-2017 skyrocketed with more than 15 countries being part of its events. But we have to recognize that since we do not have any data available for the year 2018-2019 we are not able to make more targeted conclusions.

The graph of the **Figure 11c** indicates the total number of events organized by S&TDC across the period 2014-2017. Despite the fact that we do not have any publicly available data for the years 2018-2019 and we are still in the middle of 2020, we noticed that the average number of events is around 8 per year (lowest 6 and highest 10). Furthermore, even though the outbreak of COVID-19, S&TDC continued to organize virtual meetings, even visits to universities (In June S&TDC has organized a "Virtual Visit to MIT Center for Transport and Logistics"). The new registered members seem to follow the same trend (Figure 11d) as the one in the Figure 11c. We consider the registration of a new member to happen when we indicate its first participation to any kind of event organized by the S&TDC. The rate of the new countries also follows the same increasing

trend. The S&TDC started at 2014 with 24 members and today at 2020 it has 37 members (**Figure 11d**) and still adding. However, on its official site the S&TDC refers to its organization as “an association of members from 50+ diplomatic missions and affiliated organizations in the Boston area”⁹⁰. Our research indicated 67 diplomatic missions of which only 37 are members of the S&TDC and only 35 deploy any practices of Science Diplomacy in the greater Boston area.

The countries’ participation in the events that S&TDC organized varies. Considering the categorization of the participation as 1-3 events: Rare, 4-7 events: Low, 8-13 events: Medium, 14-22 events: High and 23-30 events: Very High, we concluded that the majority of the countries with diplomatic representation has low or rare participation in the events (20 out of 37 countries) (**Figure 11f** - as we have aforementioned above according to the **Figures 11a-e**).

Key Factors for a successful Innovation Ecosystem

Our research contributed to realize the significance of the ability to gather valuable data and conduct research and analysis in order to contribute the leadership to make informed decisions. Our research was based on only the publicly available information that the diplomatic representations share with the Boston Innovation Ecosystem. For some countries the information was limited and for other abundant. The key factor for a successful Innovation Ecosystem is to be inclusive, international and interdisciplinary. Everyone should feel included and since Boston and every global city in the world is not limited by borders. The right guidance will be accessed by

A/A	Nation
1	Australia
2	Catalonia ⁹¹
3	China
4	Cyprus
5	Oman

Table 6: The listed nations do not have any diplomatic representation in the greater Boston area, but our research indicated an active role in advancing Science Diplomacy in Boston Innovation Ecosystem (participation in events organized by the S&TDC).

either the initiative of some diplomatic representations to provide leadership and produce studies regarding the Boston Innovation Ecosystem or by observing Science Technology Innovation - STI practices and policies deployed in Boston to replicate and consequently deploy them back to home

⁹⁰ Science and Technology Diplomatic Circle of Boston, S&TDC, <http://stdc-boston.com>, (accessed on July 18, 2020).

⁹¹ <https://www.accio.gencat.cat/en/accio/agencia/index.html>. Catalonia deploy Science Diplomacy in the greater Boston Area. ACCIÓ is the Catalan Government’s agency for enterprise competitiveness. Attached to the Ministry of Enterprise and Knowledge, it specializes in promoting business innovation and internationalization and has a network of 40 offices worldwide.

country. Having all these data about the Boston area and the Science Diplomacy Foreign Policymakers will be able to make decisions on how to get the right people involved (Science attaches, government representations and the profit/ non-profit organizations) by adjusting the dynamics of the Ecosystem to their abilities. Later, they can contribute the Innovation Ecosystem by educating the other through seminars such as the S&TDC events.

Conclusion

Interpreting the landscape of the Boston Innovation Ecosystem with only publicly available data in the public domain, we pursued our research to be first of all transparent and easily re-producible through years. The public information encouraged us through a holistic approach to be inclusive, international and interdisciplinary and its interpretation to be objective. By being objective and reproducible for future studies either explicitly for the Boston Innovation Ecosystem or for any Innovation hub in the globe, we give the opportunity to everyone to track and characterize the changes and the dynamics of this interconnected network. Having available studies like this, Governments can proceed to informed decisionmaking by promoting resilience and sustainability of the Innovation Ecosystem, whether it is located in Boston, Bay Area, Bangalore, Sao Paulo, Geneva or Tel Aviv and Barcelona etc. Besides, the increased interest of the EU for deploying Science Diplomacy and addressing global issues⁹² and the holistic participation of the majority of the European countries indicate the necessity of being and feeling inclusive for further synergies and informed decisionmaking for governance mechanisms and built infrastructure.

The public data reflected trends of the countries that are deploying currently Science Diplomacy in the broader Boston area. They organize visits and networking events with the private sector, whether it includes renowned businesses and companies or potential accelerators and incubators, and various visits in academic institutions by building research and collaboration bridges with the respective home country. However, there is still room for being more holistic and provide leadership in Science Diplomacy of how to participate or introducing new ideas that didn't exist before. By providing more information regarding their actions and policies of Science Diplomacy, countries and governments will show the way and be the bright example of how to be international, interdisciplinary and inclusive. They will serve as a demonstration for others to follow and will provide options (without advocacy) for further collaborations and being open without boundaries as the Boston Innovation Ecosystem is. Regarding the jurisdiction spectrum, they will bring on the table for discussion and fruitful dialogues, further research and efficient collaborations of global issues of the international level to subnational level.

Science & Technology Diplomatic Circles has tremendously contributed to the universal engagement of the diplomatic representations of the greater Boston area. By organizing almost every year a sufficient number of events, S&TDC has as a primary mission to include as many as possible countries and introduce either the Science Attaches or country's representatives to the broader Science Diplomacy network. S&TDC gathers yearly of the country members to stimulate productive dialogues for further improvements and encourages all the diplomatic representations to be active engaged of this innovative network. Even during these unprecedented times of COVID-19, S&TDC implemented webinars for further information and potential international collaborations and synergies against the global crisis, our common interests. Understanding and pursuing to advocate the common interest of the various countries to promote their national

⁹² Lorenzo Melchor, Ana Elorza, and Izaskun Lacunza. 2020. Calling for a Systemic Change: Towards a European Union Science Diplomacy for Addressing Global Challenges. V 1.0. S4D4C Policy Report, Madrid: S4D4C.

interests (such as promote the home country economic development), S&TDC aims to penetrate the countries deeper into the Boston Innovation Ecosystem.

Therefore, for a successful Innovation Ecosystem as the one of Boston, we need not only to get the right people involved but also not to exclude anyone. By educating either the future Science Attaches or the profit / non-profit organizations that collaborate with the home countries how to be international, interdisciplinary and inclusive, we can enable the system to have the dynamic to be resilient and sustainable by balancing the national interests and common interests. Cultivating a network with strong foundations, Science Diplomacy has the potential to build on synergies and capacities that exist in a way that have a broader reach, not only in Boston but in globe for a universal application.

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