



PCC Proposal to Establish a Master of Science in Climate Finance and Risk Management (Senate Document #23-24-24)

PRESENTED BY Wendy Stickle, Chair, Senate Programs, Curricula, and Courses Committee

REVIEW DATES SEC – February 21, 2024 | SENATE – March 6, 2024

VOTING METHOD In a single vote

**RELEVANT
POLICY/DOCUMENT**

**NECESSARY
APPROVALS** Senate, President, USM Board of Regents, and the Maryland Higher Education Commission

ISSUE

The Robert H. Smith School of Business proposes to establish a Master of Science in Climate Finance and Risk Management. This program will focus on the financial concepts, techniques, models and data critical to conducting financial analysis of climate change. Students will learn about the strengths and weaknesses of climate and various socioeconomic models used for portfolio allocation and investment, risk management and mitigation decisions, and financial disclosure. Emphasis will be on building students' applied skills that can readily be leveraged by companies, governmental agencies, and non-governmental organizations in tackling climate change.

The program will be 30 credits, with 12 credits of required courses and 18 credits of elective courses. Students will take core courses in the fundamentals of financial analysis, economic analysis of climate policy, climate and integrated assessment models and data, and valuation and financing of climate projects. Elective courses will further explore issues such as carbon accounting and financial disclosures, climate risk management techniques including scenario and stress test methodologies, and climate-related portfolio investment analysis.

The relationship between science and finance is an emerging area in climate change discourse that requires new tools, data, and approaches to enable the financial sector to drive climate change initiatives and strategies. An emphasis on core concepts and applications lies at the heart of the program. The educational objectives are as follows:

- Provide students with the financial, economic, risk, and business concepts required to assess climate change at a micro (company or agency) and macro (system and global-wide) level;
- Expose students to the latest scientific, socioeconomic, financial and risk models, methodologies, and data required to conduct climate-related financial and risk analysis; and
- Cultivate an interdisciplinary approach to financial and risk analysis of climate change.

No additional resources are requested for this program. The Smith School currently offers two finance master's programs, the Master of Finance and the Master of Quantitative Finance, and consequently has the existing administrative and faculty resources to offer this new program.

The proposal was approved by the Graduate School PCC committee on January 26, 2024, and the Senate Programs, Curricula, and Courses committee on February 2, 2024.

RECOMMENDATION(S)

The Senate Committee on Programs, Curricula, and Courses recommends that the Senate approve this new academic program.

COMMITTEE WORK

The committee considered this proposal at its meeting on February 2, 2024. Clifford Rossi and Mike Marcellino, from the Robert H. Smith School of Business, presented the proposal and answered questions from the committee. The committee approved the proposal.

ALTERNATIVES

The Senate could decline to approve this new academic program.

RISKS

If the Senate declines to approve this new program, the university will lose an opportunity to build on its current expertise and offerings in finance to expand into the growing field of climate change related finance and risk management.

FINANCIAL IMPLICATIONS

There are no significant financial implications with this proposal because the Smith School's current instructional and administrative resources can be used to operate the program.

904: CLIMATE FINANCE AND RISK MANAGEMENT

In Workflow

1. BMGT PCC Chair (bhorick@umd.edu; mmarcell@umd.edu)
2. BMGT Dean (welmaghr@umd.edu)
3. Academic Affairs Curriculum Manager (mcolson@umd.edu)
4. Graduate School Curriculum Manager (jfarman@umd.edu)
5. Graduate PCC Chair (jfarman@umd.edu)
6. Dean of the Graduate School (jfarman@umd.edu; sroth1@umd.edu)
7. Senate PCC Chair (mcolson@umd.edu; wstickle@umd.edu)
8. University Senate Chair (mcolson@umd.edu)
9. President (mcolson@umd.edu)
10. Board of Regents (mcolson@umd.edu)
11. MHEC (mcolson@umd.edu)
12. Provost Office (mcolson@umd.edu)
13. Graduate Catalog Manager (bhernand@umd.edu; fantsao@umd.edu)

Approval Path

1. Wed, 15 Nov 2023 22:17:26 GMT
Michael Marcellino (mmarcell): Approved for BMGT PCC Chair
2. Wed, 15 Nov 2023 22:23:51 GMT
Wedad Elmaghraby (welmaghr): Approved for BMGT Dean
3. Fri, 12 Jan 2024 19:32:25 GMT
Michael Colson (mcolson): Approved for Academic Affairs Curriculum Manager
4. Wed, 31 Jan 2024 20:15:03 GMT
Jason Farman (jfarman): Approved for Graduate School Curriculum Manager
5. Wed, 31 Jan 2024 20:15:33 GMT
Jason Farman (jfarman): Approved for Graduate PCC Chair
6. Wed, 31 Jan 2024 21:28:30 GMT
Stephen Roth (sroth1): Approved for Dean of the Graduate School
7. Wed, 07 Feb 2024 16:49:08 GMT
Wendy Stickle (wstickle): Approved for Senate PCC Chair

New Program Proposal

Date Submitted: Fri, 10 Nov 2023 16:05:15 GMT

Viewing: 904 : Climate Finance and Risk Management

Last edit: Tue, 27 Feb 2024 15:43:40 GMT

Changes proposed by: Michael Marcellino (mmarcell)

Program Name

Climate Finance and Risk Management

Program Status

Proposed

Effective Term

Spring 2024

Catalog Year

2023-2024

Program Level

Graduate Program

Program Type

Master's

Delivery Method

On Campus

Departments**Department**

The Robert H. Smith School of Business

Colleges**College**

The Robert H. Smith School of Business

Degree(s) Awarded**Degree Awarded**

Master of Science

Proposal Contact

BMGT: Mike Marcellino

Proposal Summary

The Robert H. Smith School of Business (Smith) is proposing a new program to offer a Master of Science in Climate Finance and Risk Management (MSCF). Climate change is one of our generation's greatest challenges. Tackling climate change will require a range of skills; both technical and financial. At this time, there are few educational programs available in the US or abroad that can provide students and professionals with the training needed to understand, quantify, finance, and manage the risks associated with climate change. The approach taken with the program makes it unique in that it emphasizes the important linkages between the scientific and finance communities around climate change.

(PCC Log Number 23068)

Program and Catalog Information

Provide the catalog description of the proposed program. As part of the description, please indicate any areas of concentration or specializations that will be offered.

The program focuses on financial concepts, techniques, models and data critical to conducting financial analysis of climate change. Students will learn about the strengths and weaknesses of climate and various socioeconomic models used for portfolio allocation and investment, risk management and mitigation decisions, and financial disclosure. Emphasis will be on building students' applied skills that can readily be leveraged by companies, governmental agencies and NGOs in tackling climate change. Coursework on the fundamentals of financial analysis, economic analysis of climate policy, climate and integrated assessment models and data, and valuation and financing of climate projects are highlighted in the program. Elective courses will further explore issues such as carbon accounting and financial disclosures, climate risk management techniques including scenario and stress test methodologies, and climate-related portfolio investment analysis.

Catalog Program Requirements. Please click on the help bubble for more specific information about formatting requirements.

Course	Title	Credits
Core Requirements		
BUFN610	Financial Management	2
BUFN620	Capital Markets	2
BUFN640	Financial Data Analytics	2
BUFN680	Course BUFN680 Not Found (Science of Climate Change for Finance Professionals)	2
BUFN682	Course BUFN682 Not Found (Climate Change Policy and Regulation)	2
BUFN684	Course BUFN684 Not Found (Valuing and Financing Climate Projects)	2
Electives		18
Total Credits		30

Sample plan. Provide a term by term sample plan that shows how a hypothetical student would progress through the program to completion. It should be clear the length of time it will take for a typical student to graduate. For undergraduate programs, this should be the four-year plan.

Fall Year 1 (16 cr):

Term A:

Financial Management (2 cr)

Capital Markets (2 cr)
 Science of Climate Change for Finance Professionals (2 cr)
 Financial Data Analytics (2 cr)

Term B:

Climate Change Policy and Regulation (2 cr)
 Valuing and Financing Climate Projects (2 cr)

Elective 1 (2 cr)

Elective 2 (2 cr)

Spring Year 1 (14 cr):

Term C:

Elective 3 (2 cr)

Elective 4 (2 cr)

Elective 5 (2 cr)

Elective 6 (2 cr)

Term D:

Elective 7 (2 cr)

Elective 8 (2 cr)

Elective 9 (2 cr)

Total: 30 credits

List the intended student learning outcomes. In an attachment, provide the plan for assessing these outcomes.

Learning Outcomes

Study the methodologies and data used to construct physical climate models and their outputs as well as integrated assessment models (IAMs) that leverage those outputs to generate socio-economic outputs for use in constructing financial and risk climate scenarios.

Learn how to adapt and integrate standard financial models and data for portfolio and risk analysis with physical climate data on greenhouse gas emissions, natural hazard characteristics (e.g., hurricane frequency and intensity), and related information to make financial decisions including the valuation of projects and portfolios.

Determine how to construct climate financial disclosures and evaluate a firm's physical and transition risk profile such as conducting a financed emissions analysis of a bank or evaluating the physical loss exposure to natural hazards in a loan portfolio.

Understand the economics and political economy of climate change policy and evaluate different potential regulatory policies such as the Paris Accords on Climate Change, feasibility and issues associated with carbon markets, prices and tariffs, as well as mitigation and adaptation strategies such as the prospect for geoengineering, issues associated with stranded assets as the global economy transitions to net zero carbon emissions strategies, among others.

Learn and practice what risk management strategies and actions can be useful in identifying, measuring and mitigating risk exposure to physical and transition climate risks. This will include the use of catastrophe models for determining a firm's climate value-at-risk (VaR), surveying the use of and prospect for climate and weather derivatives to mitigate climate risk, insurance and reinsurance structures including the use of catastrophe bonds to mitigate risk, among other topics.

New Program Information

Mission and Purpose

Describe the program and explain how it fits the institutional mission statement and planning priorities.

The MSCF program exemplifies core elements of University of Maryland's Strategic Plan. The program reimagines learning by adopting innovative teaching methods including an emphasis on experiential learning, combined with interdisciplinary learning to prepare our students for employment opportunities to tackle climate change, one of the university's Grand Challenges, by cultivating applied financial, economic, risk management and business skills. This program would elevate the University of Maryland's prominence in educating the next generation of analysts needed to address emerging and long-term climate-related problems.

Program Characteristics

What are the educational objectives of the program?

An emphasis on core concepts and applications lies at the heart of the program. The educational objectives are 1/ to provide students with the financial, economic, risk and business concepts required to assess climate change at a micro (company or agency) and macro (system and global-wide) level; 2/ expose students to the latest scientific, socioeconomic, financial and risk models, methodologies and data required to conduct climate-related financial and risk analysis and 3/ Cultivate an interdisciplinary approach to financial and risk analysis of climate change.

Describe any selective admissions policy or special criteria for students interested in this program.

Applicants will apply to the University of Maryland Graduate School and must have completed all of the requirements for a baccalaureate degree prior to acceptance, with particular emphasis on a sufficient mathematical and/or technical background. All applicants must submit: a) transcripts from all undergraduate and graduate institutions that have been previously attended; b) a complete online application form that includes a written essay articulating qualifications and motivation for pursuing advanced education; c) a letter of recommendation from supervisors or from professors competent to judge the applicant's probability of success in graduate school; and d) a current professional resume. After initial screening, the Smith School Admissions Office may select candidates for interviews which may be done in person or by telephone. Proof of English language proficiency (TOEFL or IELTS official scores) is also required unless the applicant has received an undergraduate or graduate degree from a select list of countries. For international student requiring an F1 visa, a completed certification of finance form and supporting financial documentation are required.

Summarize the factors that were considered in developing the proposed curriculum (such as recommendations of advisory or other groups, articulated workforce needs, standards set by disciplinary associations or specialized-accrediting groups, etc.).

In 2020, the Finance Department initiated an interdisciplinary joint effort between the College of Mathematics and Natural Science, the Robert H. Smith School of Business and the Earth Systems Science Interdisciplinary Center on Climate Finance. Faculty from the Atmospheric and Oceanic Science Department and Finance Department have collaborated on several research studies, articles, webinars, Congressional Testimony, corporate, NGO, federal and state agency discussions on climate finance and risk as well as executive education on climate finance and risk management. ELPs organized for institutions such as Freddie Mac and Fannie Mae for MFin and MQF students on climate risk-related projects have been highly successful. All of these efforts in addition to considerable review of other global MS-level programs on climate finance led to the decision that the University of Maryland should initiate the MSCF.

Select the academic calendar type for this program (calendar types with dates can be found on the Academic Calendar). Please click on the help bubble for more specific information.

Other

Indicate whether relevant offices, such as the Registrar's Office and International Scholar and Student Services, have been notified and support the program. Non-standard terms need to fit within the University's scheduling system calendar, and non-standard terms need to work with international student visa requirements.

The proposed term schedule will match the current format of existing Master's programs at the Smith School. The new program will not alter current format, calendar, or academic terms which are already in use and vetted by Registrar and ISSS.

Term Structure. Describe 1) the proposed term structure for this program, and 2) rationale for this term structure.

This program will use the semester calendar but will offer courses in a non-standard time frame that splits the semester in half (1st and 2nd terms), similar to the current Smith Master's program structure.

For Master's degree programs, describe the thesis requirement and/or the non-thesis requirement.

This Master's degree does not provide a thesis option. Student will follow the non-thesis option which requires all students to complete 30 credits of which 12 credits are core and the remaining credits are electives. These electives may be bundled into different specializations as the market demands shift.

Identify specific actions and strategies that will be utilized to recruit and retain a diverse student body.

The Robert H. Smith School of Business community is multifaceted at every level – students, staff and faculty represent the spectrum of diversity. With a large population of international students and a diverse blend of backgrounds, nationalities, ethnicities and experiences, Smith students have an opportunity to make connections with those who share their interests, and to grow and learn by making new friends and sharing new experiences. The School engages in recruiting and outreach events across the globe to generate a diverse student body

Relationship to Other Units or Institutions**If a required or recommended course is offered by another department, discuss how the additional students will not unduly burden that department's faculty and resources. Discuss any other potential impacts on another department, such as academic content that may significantly overlap with existing programs. Use space below for any comments. Otherwise, attach supporting correspondence.**

All required and recommended courses will be offered within the Smith School. There will be some overlap of content with courses offered by Atmospheric and Oceanic Sciences on Climate Change modeling. However, the associated Smith courses will focus on applications of such models within Finance, and would not be expected to cannibalize any student demand for AOSC courses. In some cases, AOSC faculty may be invited to participate in teaching or co-teaching the relevant Smith courses on an adjunct basis.

Accreditation and Licensure. Will the program need to be accredited? If so, indicate the accrediting agency. Also, indicate if students will expect to be licensed or certified in order to engage in or be successful in the program's target occupation.

The Smith School is annually accredited by AACSB - The Association to Advance Collegiate Schools of Business - the foremost accreditation body of business schools in the world. Maryland Smith's Dean often sits on committees and task forces within AACSB and faculty and staff contribute and participate in AACSB affinity groups and conferences. Maryland Smith is also regionally accredited through MHEC - the Maryland Higher Education Commission.

Describe any cooperative arrangements with other institutions or organizations that will be important for the success of this program.

Not applicable. All aspects of the program from admissions to academic programming to career advising will be provided by the Smith School. While the program will reach out to local companies and institutions for guest speakers, internship opportunities, experiential learning projects, and job placement, no particular relationship is pivotal to the success of the program.

Faculty and Organization

Who will provide academic direction and oversight for the program? In an attachment, please indicate the faculty involved in the program. Include their titles, credentials, and courses they may teach for the program. Please click on the help bubble for a template to use for adding faculty information.

A faculty member from Smith would be named as Academic Director of the MSCF program to provide oversight for all aspects of the program.

Indicate who will provide the administrative coordination for the program

The Academic Director in collaboration with the Masters Programs Office at Smith will provide administrative coordination.

Resource Needs and Sources

Each new program is required to have a library assessment prepared by the University Libraries in order to determine any new library resources that may be required. This assessment must be done by the University Libraries. Add as an attachment.

See Attached

Discuss the adequacy of physical facilities, infrastructure and instructional equipment.

The implementation of the new program will require some additional classroom usage in the Van Munching Hall. The program can be implemented within existing resources and equipment.

Discuss the instructional resources (faculty, staff, and teaching assistants) that will be needed to cover new courses or needed additional sections of existing courses to be taught. Indicate the source of resources for covering these costs.

There will be some content overlap with the existing Master of Finance and Master of Quantitative Finance programs offered at Smith. Some courses will be entirely new, while others already exist or can be taught as specialized sections of existing courses. Overall, we expect on average an additional load of 16-20 credit hours per year to be generated by the new program. This will also bring an additional 16-20 credit hour grading assistance by GAs. These costs are expected to be supported by tuition revenue from the program.

Discuss the administrative and advising resources that will be needed for the program. Indicate the source of resources for covering these costs.

Advising of the students will be done mainly by the program director with the help of a program advisor from the Smith Masters Programs Office. Administration of the program will be done by the program director together with administrative staff at the Smith Masters Program Office. These costs are expected to be supported by tuition revenue from the program.

Use the Maryland Higher Education Commission (MHEC) commission financial tables to describe the program's financial plan for the next five years. See help bubble for financial table template. Use space below for any additional comments on program funding. Please click on the help bubble for financial table templates.

See attachment.

Implications for the State (Additional Information Required by MHEC and the Board of Regents)

Explain how there is a compelling regional or statewide need for the program. Argument for need may be based on the need for the advancement of knowledge and/or societal needs, including the need for "expanding educational opportunities and choices for minority and educationally disadvantaged students at institutions of higher education." Also, explain how need is consistent with the Maryland State Plan for Postsecondary Education. Please click on the help bubble for more specific information.

The linkages between science and finance are an emerging area in the climate change discourse that require new tools, data, and approaches to enable the financial sector to drive climate change initiatives and strategies. Today there are virtually no academic programs where those skills can be obtained. The proposed degree program would be unique in this regard within the state and region. An assessment was conducted of other similar graduate degree programs at academic institutions in the US and abroad. This survey identified about 20 programs offering some form of masters-level degree dealing with climate change issues. Only five were found in the U.S., and these are oriented largely toward climate or environmental science. The others were largely offered by UK or European academic institutions. Eight of these had some form of climate finance or risk orientation to them. The program closest in alignment to this proposed offering is the Imperial College Business School MSc in Climate Change, Management and Finance. It too is a 1-year interdisciplinary program on climate science, policy, finance, and risk management. From discussions with faculty and students in this program it has met with a high degree of interest that translated into a sizable first-year enrollment of approximately 150 students.

Present data and analysis projecting market demand and the availability of openings in a job market to be served by the new program. Possible sources of information include industry or disciplinary studies on job market, the USBLS Occupational Outlook Handbook, or Maryland state Occupational and Industry Projections over the next five years. Also, provide information on the existing supply of graduates in similar programs in the state (use MHEC's Office of Research and Policy Analysis webpage for Annual Reports on Enrollment by Program) and discuss how future demand for graduates will exceed the existing supply. As part of this analysis, indicate the anticipated number of students your program will graduate per year at steady state.) Please click on the help bubble for specific resources for finding this information.

It is expected that future demand for graduates with skills in Climate Finance and Risk Management will be robust. Companies, government agencies and nonprofits will need employees that have a blend of climate science and financial technical skills to develop data and scientific models for use in financial and risk modeling, and to comply with rapidly changing regulatory requirements for disclosure and mitigation. A 2021 article on the World Economic Forum website by the chief economist of LinkedIn, Karin Kimbrough, notes that green jobs are growing fast in many industries, including finance. The author notes that at least 24 million new green jobs are expected to be created worldwide by 2030. According to the LinkedIn data, the finance industry saw 6% growth in the share of employees with Green Skills or Jobs (among the highest in all industries tracked), but still had a small percentage of overall green jobs, leaving substantial room for accelerated growth. Another report by LinkedIn in 2022 notes that the growth in job postings requiring green skills is outstripping the growth in employees with such skills (8% annually versus 6% annually from 2016-2021), and lists Finance as one of the areas for which workers have a low average green intensity now but workers are transitioning into green/greening jobs quickly. In June of 2021, PriceWaterhouseCoopers announced that it would hire 100,000 people focused on Environmental, Social, and Governance issues. These needs are not currently being met by any degrees offered in the state or the region. To our knowledge there is no existing supply of graduates within the state trained in Climate Finance and Risk Management. We currently anticipate steady-state enrollment of approximately 40 students per year.

Identify similar programs in the state. Discuss any differences between the proposed program and existing programs. Explain how your program will not result in an unreasonable duplication of an existing program (you can base this argument on program differences or market demand for graduates). The MHEC website can be used to find academic programs operating in the state. Please click on the help bubble for specific information on finding similar programs within the state.

The closest related in-state or regional degree program is a Master in Sustainable Energy offered by Johns Hopkins School of Advanced International Studies, which is focused on sustainability in the Energy industry and has no Finance or Risk Management component. There would be little or no overlap between the MSCF and this program.

Discuss the possible impact on Historically Black Institutions (HBIs) in the state. Will the program affect any existing programs at Maryland HBIs? Will the program impact the uniqueness or identity of a Maryland HBI?

We are not aware of any programs at any HBIs in the state that would be affected by the proposed MSCF degree program. We do not believe the program would impact the uniqueness or identity of a Maryland HBI since there will be no direct competition for students or resources.

Supporting Documents

Attachments

Financial Plan.pdf
 Master of Science Climate Finance_Learning Outcomes_2023.docx
 Collection_Assessment_MS_Climate_Finance_2023.docx
 Appendix 4 Learning Outcomes and Electives Update.pdf

Reviewer Comments

Dawn Jourdan (djourdan) (Mon, 15 Jan 2024 19:40:53 GMT): Program does not embrace existing coursework in MAPP or SPP in the fields of climate and sustainability.

Michael Colson (mcolson) (Fri, 09 Feb 2024 16:19:18 GMT): The Smith School has requested the CIP code to be 27.0305.

Key: 904

TABLE 1: RESOURCES					
Resources Categories	Year 1	Year 2	Year 3	Year 4	Year 5
1. Reallocated Funds	\$ -	\$ -	\$ -	\$ -	\$ -
2. Tuition/Fee Revenue (c+g below)	\$ 1,222,980	\$ 1,511,603	\$ 2,075,935	\$ 2,138,213	\$ 2,202,360
a. #FT Students	25	30	40	40	40
b. Credit Hour Rate	\$ 1,631	\$ 1,680	\$ 1,730	\$ 1,782	\$ 1,835
c. Annual Credit Hours	\$ 30	\$ 30	\$ 30	\$ 30	\$ 30
d. Annual Fee Rate	\$ 48,919	\$ 50,387	\$ 51,898	\$ 53,455	\$ 55,059
3. Grants, Contracts, & Other External Sources	\$ -	\$ -	\$ -	\$ -	\$ -
4. Other Sources	\$ -	\$ -	\$ -	\$ -	\$ -
TOTAL (Add 1 - 4)	\$1,222,980	\$1,511,603	\$2,075,935	\$2,138,213	\$2,202,360
Assumes 3% inflation in Credit Hour Rate. Credit Hour Rate is current In-State MFIN/MQF tuition rate.					

TABLE 2: EXPENDITURES					
Expenditure Categories	Year 1	Year 2	Year 3	Year 4	Year 5
1. Faculty (b+c below)	\$598,500	\$616,455	\$634,949	\$653,997	\$673,617
a. #FTE	2.0	2.0	2.0	2.0	2.0
b. Total Salary	\$450,000	\$463,500	\$477,405	\$491,727	\$506,479
c. Total Benefits	\$148,500	\$152,955	\$157,544	\$162,270	\$167,138
2. Admin. Staff (b+c below)	\$133,000	\$136,990	\$141,100	\$145,333	\$149,693
a. #FTE	1.0	1.0	1.0	1.0	1.0
b. Total Salary	\$100,000	\$103,000	\$106,090	\$109,273	\$112,551
c. Total Benefits	\$33,000	\$33,990	\$35,010	\$36,060	\$37,142
3. Total Support Staff (b+c below)	\$93,100	\$95,893	\$98,770	\$101,733	\$104,785
a. #FTE	1.0	1.0	1.0	1.0	1.0
b. Total Salary	\$70,000	\$72,100	\$74,263	\$76,491	\$78,786
c. Total Benefits	\$23,100	\$23,793	\$24,507	\$25,242	\$25,999
4. Graduate Assistants (b+c)	\$0	\$0	\$0	\$0	\$0
a. #FTE					
b. Stipend					
c. Tuition Remission					
d. Benefits					
5. Program Director Supplement	\$15,000	\$15,450	\$15,914	\$16,391	\$16,883
6. Student Services	\$50,000	\$60,000	\$75,000	\$75,000	\$75,000
7. New or Renovated Space	\$0	\$0	\$0	\$0	\$0
8. Marketing	\$100,000	\$75,000	\$75,000	\$75,000	\$75,000
9. Recruiting & Admissions	\$50,000	\$75,000	\$75,000	\$75,000	\$75,000
10. Career Services	\$50,000	\$75,000	\$100,000	\$100,000	\$100,000
11. Student Aid	\$50,000	\$100,000	\$100,000	\$100,000	\$100,000
12 Other Expenses	\$0	\$0	\$0	\$0	\$0
TOTAL (Add 1 - 8)	\$1,139,600	\$1,249,788	\$1,315,732	\$1,342,454	\$1,369,977
resources - expenditures	\$83,380	\$261,815	\$760,204	\$795,760	\$832,382
			Benefits %	0.33	
			Inflation	1.03	

Master of Science Climate Finance

Learning Outcomes

Each course in the curriculum is intended to provide students with the necessary concepts and empirical tools to conduct climate-related financial and risk analysis. A combination of periodic examination, case studies and experiential learning will be used to assess student learning outcomes. Each student as part of the program will be expected to participate in a 2-credit Experiential Learning Program (ELP) that will provide a realistic team-based project that leverages each student's technical skills learned in their other coursework as well as cultivating their teamwork, communications and project management skills with senior leaders from sponsoring corporations or agencies on a specific climate-related problem.

DATE: August 23, 2023

TO: Caroline Lukich, Director Graduate Program
Mike Marcellino, Assistant Dean of MBA & MS Programs
Robert H. Smith School of Business (Smith)

FROM: On behalf of the University of Maryland Libraries:
Zaida M. Díaz, Business and Economics Librarian
Maggie Saponaro, Director of Collection Development Strategies
Daniel Mack, Associate Dean, Collection Strategies & Services

RE: Library Collection Assessment for Master of Science in Climate Finance (MSCF)
(In-Person: BMGT 904 and Online: BMGT 875)

We are providing this assessment in response to a proposal by the Office of Graduate Program and MBA & MS Programs in The Robert H. Smith School of Business (Smith) to create a Master of Science in Climate Finance (MSCF) for in-person (BMGT 904) and/or online (BMGT 875) instruction. The MSCF Program Directors asked that we at the University of Maryland Libraries assess our collection resources to determine how well the Libraries support the curriculum of these proposed programs.

This collection assessment does not intend to provide a comprehensive list of resources, but rather aims to highlight a wide-range of relevant resources that accommodate the specific educational objectives of the proposed MSCF program when exploring topics or concepts around: “financial and risk analysis of climate change at the micro/macro levels, latest scientific, socioeconomic, financial and risk models, methodologies and data required to conduct climate related financial and risk analysis”, among others. Furthermore, this collection assessment follows the interdisciplinary approach of the program, looking at the connection “between the scientific and finance communities around climate change”, and also considering the precedence of initiated joint efforts between the Smith School of Business (Finance Department) and the College of Mathematics and Natural Science, and the Earth Systems Science Interdisciplinary Center on Climate Finance.

Serials Publications

As noted, the program aims to address technical and financial skills as applied to climate change, targeting practical and applied research. To keep up to date with all the latest developments to support students, faculty and researchers, the UMD Libraries have compiled a list of the top academic journals in business and economics, including resources in the area of environmental sciences. Most likely course assignments will rely upon online journals containing the latest cutting-edge research in a wide range of areas relevant to the MSCF program.

The University of Maryland Libraries currently subscribe to a large number of scholarly journals, almost all in online format. Many of these are top ranked journals by the **Journal Citation Reports*, in terms of research impact and are widely recognized in the fields of information systems and business analytics, marketing analytics, finance, and/or financial market regulation or financial operations. In cases in which

the Libraries do not subscribe to highly ranked journals or any other articles in journals that we do not own, they likely will be available through our Interlibrary Loan/Document Delivery Services.

*Note: *Journal Citation Reports* is a tool for evaluating scholarly journals. It computes these evaluations from the relative number of citations compiled in the *Science Citation Index* and *Social Sciences Citation Index* database tools.

Top Academic Journals in Business and Economics

Below is a current (2023) listing of the field's top journals, most of which are also relevant to the MSCF Program. It includes most of the top titles from the *Financial Times* research ranking for business schools, as well as the source or database name where it can be located. **Note: It is worth noting that journals that we do not own likely will be available through Interlibrary Loan/Document Delivery.**

Academy of Management Journal (via Business Source Complete)
Academy of Management Review (via Business Source Complete)
Accounting, Organizations and Society (via ScienceDirect Journals)
Accounting Review (via Business Source Complete)
Administrative Science Quarterly (via Sage Journals)
American Economic Review (via American Economic Association and JSTOR)
Contemporary Accounting Research (via Wiley Journals)
Econometrica (via Wiley Journals)
Harvard Business Review (via Business Source Complete)
Journal of Accounting and Economics (via ScienceDirect Journals)
Journal of Accounting Research (via Wiley Journals)
Journal of Applied Psychology (via Business Source Complete)
Journal of Business Ethics (via Springer Online Journals)
Journal of Business Venturing (via ScienceDirect)
Journal of Consumer Psychology (via Wiley Journals)
Journal of Consumer Research (via Business Source Complete)
Journal of Finance (via Wiley Journals)
Journal of Financial Economics (via ScienceDirect)
Journal of International Business Studies (via Springer Link)
Journal of Management (via Sage Journals)
Journal of Management Studies (via Wiley Journals)
Journal of Marketing (via Business Source Complete)
Journal of Marketing Research (via Business Source Complete)
Journal of the Academy of Marketing Science (via SpringerLink)
Management Science (via INFORMS PubOnLine)
Marketing Science (via INFORMS PubOnLine)
MIS Quarterly (via Business Source Complete)
MIT Sloan Management Review (via Business Source Complete)
Review of Accounting Studies (via SpringerLink)
Review of Finance (Business Source Complete)
Review of Financial Studies (via Business Source Complete, Oxford Journals)

Databases by Subject Areas Relevant to the MSCF Program

Business and Economics

The Libraries' *Database Finder* (<https://lib.guides.umd.edu/az.php>) resource offers online access to databases that provide indexing and access to scholarly journal articles and other information sources. Many of these databases cover subject areas that would be relevant to the new Master of Science in Climate Finance (MSCF) program, below is a highlight of some of these resources. **Note: This is not a comprehensive list of resources.**

The *Virtual Business Information Center* (VBIC) <https://lib.guides.umd.edu/vbic>, is the business and economics resource guide developed and maintained by the business subject specialists to provide exclusive access to databases and/or datasets subscriptions available, both at the Libraries and also at the Smith School of Business. This guide can be easily accessible to faculty and students via their [vSmith Portal](#). It is intended as a main research and teaching tool for researchers.

- *Bloomberg* (Bloomberg) - Contains news, current, and historical financial data and analysis for individual companies, stock market indices, fixed-income securities, currencies, commodities, economics, and derivatives for both international and domestic markets. Note: Access available in Van Munching Hall Financial Markets and Computing Lab/Labs (1572 and 3505 Van Munching Hall), and Smith School DC, Baltimore, and Shady Grove campuses.
- *Business Source Complete* (EBSCO) – Comprehensive database of business sources, includes over 3600 peer reviewed journals, trade publications, magazines, books, case studies, company profiles, SWOT analysis, etc. It provides full-text access to the Harvard Business Review, and thousands of trade publications, and peer-reviewed journals covering topics such as: management, marketing, economics, finance, accounting and international business, as well as indexing and abstracts for business journals dating back to 1886.
- *EconLit* (American Economic Association) – Comprehensive database of citations and abstracts to economic research in over 400 books, journals, dissertations, and working papers. Topics include: accounting, capital markets, econometrics, economic forecasting, theory and history, government regulations, labor economics, monetary theory and financial institutions, international, regional and urban economics, etc. 1969 - present.
- *Factiva* (Dow Jones) – Provides access to a great deal of business news content covering industries, companies, and general business. Includes full text of the *Wall Street Journal*, *BusinessWeek*, *Dow Jones Newswires*, *Reuters Newswires*, and other major business news publications, as well as full text of many online sources, such as the WSJ online, business blogs, and company blogs. It provides international coverage, including most major world news publications. It is an excellent source for learning more about emerging Social Media companies through its full text searching. With the Factiva News Pages, you can glance at key stories from leading newspapers, including the *Wall Street Journal*, *New York Times*, *Washington Post*, etc.
- *IBISWorld* – The Industry Reports are the main focus of the database. Each report contains an “at a glance” overview (including SWOT analysis), performance data, outlook data, products &

markets analysis, competitive landscape analysis, lists of major companies, operating conditions, and key statistics. Statistics include financial ratios and industry averages from the Risk Management Association. It contains reports on industries in the following markets: China, Global, and U.S. The U.S. content is further subdivided into: Industry Reports classified by NAICS (North American Industry Classification System); Specialized Industry Reports for industries not adequately covered by NAICS; US Industry State Reports; US State Economic Profiles; US Industry iExpert Summaries; US Specialized Industry iExpert Summaries; US Business Environment Profiles; US Business Environment State Profiles.

- *Investext* (Mergent) – Contains over 18 million current and historical broker research reports on companies, products, markets, and over 125 industries. These reports have been sourced from more than 1700 brokerages, including Barclays, Credit Suisse, Deutsche Bank, J.P. Morgan, and UBS. Date coverage varies per brokerage.
- *Mergent Online* (Mergent) – Provides information on over 25,000 U.S. public companies, over 35,000 foreign public companies, and over 34,000 private companies. Information available for each public company includes a complete corporate history; lists of subsidiaries; property holdings, and key personnel; up to 25 years of annual and quarterly financial data; up to 10 years of scanned, full-image annual reports, including SEC filings; extensive information about the corporation's current long term debt; links to recent news reports, and Reports on insider and institutional owners. A variety of search options are available, including company name, ticker symbol, executive's name, auditor, country code, NAICS or SIC industry code, and selected financial characteristics and ratios. In addition to the main Mergent Online database, the Smith School of Business has access to one additional resource available as a tab on the Mergent Online platform, see: *Investext*.
- *Mintel Consumer Intelligence Reports* (Intel Group LTD) – Intel provides full-text reports on a wide range of market research studies, analyzing market sizes and trends, market segmentation, consumer attitudes and purchasing habits, opportunities, weaknesses and the future of the market. The reports cover the United States and feature such industries as: food service, food, drink, pursuits/hobbies, travel, clothing/fashion, health/medical, beauty/personal, household, services, publishing, automotive, and e-commerce. 1994-present.
- *Nexis Uni* (formerly: LexisNexis Academic) – Full-text access to over 15,000 sources of news, business, legal, and reference information, including hundreds of U.S. and foreign newspapers, legal and business publications, wire services, broadcast media transcripts, and trade/news magazines.
- *OECD iLibrary* (OECD) – The online library of the Organization for Economic Co-operation and Development. Comprises 20 book collections by theme, containing all OECD monographs and reports, most OECD periodicals, and the OECD statistical databases. Note: Even though current access to the database ended on August 31, 2018, since we have perpetual access rights to OECD, there will be content available, covering 1998-2018.
- *Passport* (Euromonitor Intl'.) – Provides comparable statistics for 205 countries on economic indicators, health, foreign trade, environment, lifestyle, industrial and agriculture output,

communications and more. Also includes market size data for over 300 consumer products and services. It covers demographic trends, economic indicators, finance, foreign trade, health, labor force, industrial and agricultural production, environmental data, consumer expenditure patterns, retail sales, advertising and media patterns, consumer prices, household patterns, literacy rates, telecommunications, automotive and transport figures, travel and tourism, income and earnings potential. It also includes market size data for over 300 consumer products and services.

- *Science Direct* (Elsevier) – It is an international leading source for scientific, technical, and medical research. It is a peer-reviewed, full text database containing e-books and online journal titles covering the fields of business, computing, economics, science, technology, health and life sciences.
- *World Development Indicators Online* (World Bank) – Provides direct access to more than 550 development indicators, with time series for 200 countries and 18 country groups from 1960, where data are available. Data export options in Excel or ASCII.

Environmental Sciences

- *ACSESS Digital Library* – The Alliance of Crop, Soil, and Environmental Science Societies (ACSESS) is composed of the American Society of Agronomy (ASA), the Crop Science Society of America (CSSA), and the Soil Science Society of America (SSSA). The ACSESS Digital Library is a complete collection of all content published by these societies. The Digital Library allows users to search and browse all the published literature of these societies simultaneously through a single platform.
- *AGRICOLA* – Citations to journal articles, book chapters, monographs, conference proceedings, serials, technical reports, and other materials on a range of agricultural topics.
- *BioOne* – Offers full text of high-impact research journals, focused in the biological, ecological, and environmental sciences and published mostly by small societies and non-commercial publishers.
- *ClimateWire* – Covers the debate over climate policy and its effects on business, the environment and society. It covers in-depth every day the key issues that surround the debate over climate change. It delivers news-breaking coverage to the people who make, influence or will be affected by climate policy. Federal agency programs, legislation, policies and funding; State program development and implementation; International agency activities; Corporate/multi-national response to climate concerns; Kyoto implementation and Post-Kyoto negotiations; and more. Time span: 2009 to the present. Updated daily at 8 am.
- *EnergyWire* – Provides coverage on the business and political issues surrounding the rapidly expanding unconventional energy industry in the United States and around the world.
- *Environment & Energy Daily* – Tracks environmental and energy action in Congress. Include access to E&E News PM and E&E TV News. 1996 - present.

- *Environmental Studies in Video* – At completion, Environmental Studies in Video will contain 500 hours of film covering all realms of environmental studies, particularly ethics, policy, economics, sociology, planning and environmental science. Films were produced from 1970 to the present, and address specific topics including alternative energy, pollution control, eco-design, sustainability, farming and agriculture, the food industry, LEED certification, waste issues and climate change. 2 free perpetual access titles per CIC, no charge to us. Selections should be emailed to Mary Siegel at siegel@alexanderstreet.com
- *Garden, Landscape & Horticulture Index* – Access to articles in the subject areas of Horticulture, Botany, Garden and Landscape Design, Ecology, Plant and Garden Conservation, Horticultural Therapy, and Sustainable Horticultural Design Practices.
- *GreenFile* – Collection of scholarly, government and general-interest titles includes content on the environmental effects of individuals, corporations and local/national governments, and what can be done at each level to minimize these effects. Topics covered include global climate change, green building, pollution, sustainable agriculture, renewable energy, recycling, and more.
- *Greenwire* – Comprehensive, daily coverage of environmental and energy politics and policy, includes summaries of important energy and environmental policy coverage from hundreds of print, broadcast and online sources, including editorials. Greenwire's archive of key documents provides direct links to reports, analyses, memos, court cases and over 30,000 Greenwire stories. Includes new video and transcripts. State, national, and international coverage of environmental and energy-related politics, news, policy, and markets. 1996 to the present.
- *Maryland Attorney General Opinions* – Online access to the text of Attorney General Opinions. 1993 to present.
- *Maryland General Assembly* – Information about the General Assembly's activity, including bills and proceedings (1996-2002 sessions) and budget information (2002 session).
- *NTRL (Alternate Name(s): National Technical Reports Library)* – Covers U.S. government-sponsored research and reports from federal agencies including technical research reports, journal articles, data files, computer programs and audio-visual products. 1964 - current.
- *Oxford Bibliographies Online: Ecology* – Online bibliographic guide to current scholarship, containing original commentary and annotations. Gathers together a large collection of articles addressing themes and topics within Ecology.
- *TRID (Alternate Name(s): Transportation Research Information Database)* – Integrated database that combines the records from TRB's Transportation Research Information Services (TRIS) Database and the OECD's Joint Transport Research Centre's International Transport Research Documentation (ITRD) Database. TRID provides access to more than one million records of transportation research worldwide. 1960-present (but there is some material from the 1950s included) The PATH Database, the largest bibliographic database on intelligent transportation systems (ITS), is now available as part of TRIS.

General and Multidisciplinary Databases

- *Academic Search Ultimate* (EBSCO) – Multi-disciplinary database providing information for nearly every area of academic study. Includes an enormous collection of the most valuable peer-reviewed full text journals, as well as additional journals, magazines, newspapers and books. Multidisciplinary subjects including: social sciences, humanities, education, computer sciences, engineering, physics, chemistry, language & linguistics, arts & literature, medicine, ethnic studies. 1965- present.
- *Docuseek2 Complete Collection* – A collection of issues-based documentary films from leading film producers and distributors including Bullfrog Films, Icarus Films, the BBC, the National Film Board of Canada, CBC, Television Trust for the Environment, MediaStorm, Terra Nova Films, KimStim, Scorpion TV and other independent filmmakers. Disciplines supported by this collection include environmental studies and sciences, sociology, anthropology, global studies and arts.
- *Films on Demand Master Academic Collection* – Streaming video service of almost 12,000 full length videos of high-quality educational titles. Subject sets featured are: business & economics, humanities & social sciences, science & mathematics, health & medicine. This collection also includes thousands of video clips and a collection of archival films & newsreels. Special features allow users the ability to organize and bookmark clips, create and share playlists; most videos available with closed-captioning and interactive transcripts; may be viewed through most mobile devices.
- *HathiTrust Digital Library* – NOTE: Download of full book PDF files may require login with University ID. A shared, growing digital repository of millions of books and periodical volumes scanned from major research libraries, including those digitized by institutional effort and by both Google and the Internet Archive. Offers full-text searching and advanced bibliographic search capabilities (such as author, title, publisher, language, etc.), and full PDF downloading of works in the public domain.
- JSTOR – Electronic archive of core journals in the humanities, social sciences, and sciences. Includes complete runs of journals with full-text of all articles published from volume 1, issue 1. Please note, most journals have a “moving wall” (time lag) of three to five years between the most current issue published and content available on JSTOR. Coverage spans the humanities, sciences, and social sciences.
- *MasterFILE Premier* – Provides abstracts and indexing for 2,650 general periodicals. Full text of articles for nearly 2,000 periodicals, and 5,000 full text Magill Book Reviews. Multidisciplinary subjects including general reference, business, education, health, general science, multicultural issues, biography, and travel. 1975- present.
- *ProjectMUSE* – Full text of recent issues of over 240 journals from 40 scholarly publishers. Covers the fields of literary studies, history, the visual & performing arts, cultural studies, education, political science, gender studies, economics, and many other arts and humanities and social science disciplines. Covers the fields of literature and criticism, history, the visual and performing arts, cultural studies, education, political science, gender studies, economics, and

many other arts and humanities and social science disciplines. Time span: Varies by journal. Some go back to 1993, the majority from 1997 to the present.

- *Web of Science Core Collection* – provides comprehensive coverage of the sciences, social sciences, arts, and humanities across journals, books and conference proceedings. It indexes more than 5,700 major journals across 164 scientific disciplines. The best database for finding what papers have cited other papers. Cited references can be traced forward in time. Web of Science Training Materials available here: http://wokinfo.com/training_support/training/web-of-science
- *World Scientific eBooks* – Titles in the collection span a wide variety of subjects: Mathematics, Physics/Nonlinear Science, Chemistry/Materials Science/Nanotechnology, Computer Science, Engineering, Environmental Science, Medicine and Healthcare, Life Sciences, Business and Economics, General and Popular Science, Social Sciences and Asian Studies.
- *Worldwide Political Science Abstracts* – Provides coverage of the international serials literature in political science and its complementary fields, including international relations, law, and public administration / policy. International coverage of political science, international relations, business & economics, law, and public administration and policy. 1975 to the present.

In many, and likely in most cases, these indexes offer full text copies of the relevant journal articles. In those instances in which the journal articles are available only in print format, the Libraries can make copies available to students and faculty through the Libraries' Interlibrary Loan service (<https://www.lib.umd.edu/find/ill>) and also guide you through the request process (<https://www.lib.umd.edu/access/ill-article-request>).

Data Mapping

- *PolicyMap* (PolicyMap) – It provides access to over 15,000 indicators related to housing, crime mortgages, health, jobs, demographics, and education from more than 150 authoritative public and proprietary sources. Data is cleaned and standardized and updated regularly. It uses basic GIS tools to create reports and maps.
- *Simply Analytics* (formerly: SimplyMap) – Simply Analytics is a web-based mapping application that creates thematic maps and reports using demographic, business, and marketing data. Data can be downloaded for use with other software such as Excel and GIS. It contains extensive data on demographic, historic census, business, health, real estate, housing, employment, consumer spending, and marketing (over 70,000 variables total). Users can create customized maps and reports; data is down to the census tract level. Data is available at the State, County, City, ZIP Code, Census Tract and Block Group level as well as custom trade areas and the entire United States.

Foundation/Grants Directory

- *Foundation Directory Online (FDO)* - is the leading resource in the world of philanthropy. It provides everything about U.S. foundations and their millions of grants around the world. Search up to nine databases at once: grantmakers, companies, grants, 990s, RFPs, philanthropy news, foundation-sponsored publications, nonprofit literature, and jobs. Includes descriptions of more than 100,000 Community Foundations; Corporate Giving Programs, Operating Foundations, Private Grantmaking Foundations (independent and company-sponsored foundations); and Grantmaking Public Charities.

Monographs and eBooks

The Libraries regularly acquire scholarly monographs in all areas of business, art and art history, and allied subject disciplines. Monographs not already part of the collection can usually be added upon request.

Even though most library research for this program likely will rely upon online journal articles, students may wish to supplement this research with monographs. Fortunately, more and more monographs are available as individual e-books or through online collection packages, among them:

- *EBSCO eBook Collection* – A collection of e-texts covering topics in computer science, business, international relations, education, environmental science, psychology, and civil rights law and history.
- *Gale Virtual Reference Library* – Offers more than 85 reference sources including encyclopedias, almanacs, series and more. Provides access to more than 300 encyclopedias and selected industry-standard reference series. Including content from SAGE Reference, John Wiley & Sons, Cambridge University Press, Berkshire Publishing Group, Cartographica, Linworth and Gale imprints.
- *Historical Encyclopedia of American Business* (through Gale) – Covers the full breadth of American business history. Includes overviews on different sectors of the economy, individual industries, significant economic events, and general topics such as business cycles, labor strikes and outsourcing. There are also overviews on broad legal topics such as antitrust legislation, bankruptcy laws and patent laws. Also offers brief biographies of individual persons who have played exceptional roles in American business as well as information about individual companies, corporations, labor unions, and government agencies.
- *Project Muse/UPCC Ebooks* – Full-text access to thousands of books published by major university presses.
- *ProQuest Ebook Central* – Ebrary is a collection of thousands of online full text books and other materials in a variety of subject areas. In order to view, copy, or print you will need to install the ebrary Reader software.
- *Sage Research Methods* (or Sage Research Methods Online or SRMO or SRM Research Methods Online) – SRM is a large collection of books, reference books, videos, and datasets on social

science research methods. It includes a methods map, project planning tool, and the notable "little green book" series (Quantitative Applications in the Social Sciences) and the "little blue book" series (Qualitative Research Methods) in full text. SRM also includes the Practical Skills & Academic Research video collection of 440 streaming videos specifically on social science research skills. This collection covers key areas such as writing a research proposal, planning and designing a research project, and securing ethical approval are explicitly covered. Practical skills such as project management, writing for publication, presenting work, and building networks are also presented.

- *Springer Complete eBook Collection* – Springer provides online full-text access to thousands of English, French, Italian, and Spanish books in the arts, sciences, law, mathematics, medicine, computing, and other disciplines. Most books are from 1996 to the present, and include Apress, Birkhauser, Copernicus Books, Humana Press, Physica – Verlag, Plenum US, Springer, Springer – Verlag, Steinkopff, and TELOS imprints.
- *World Scientific eBooks* – Titles in the collection span a wide variety of subjects: Mathematics, Physics/Nonlinear Science, Chemistry/Materials Science/Nanotechnology, Computer Science, Engineering, Environmental Science, Medicine and Healthcare, Life Sciences, Business and Economics, General and Popular Science, Social Sciences and Asian Studies.

Even in instances when the books are only available in print, students and faculty will be able to request specific chapters for online delivery through the Interlibrary Loan program (<https://www.lib.umd.edu/find/request-digital/ILL/how-article>).

WorldCat UMD Online Catalog

A search of the University of Maryland Libraries' [WorldCat UMD online catalog](#) was conducted, using a variety of relevant subject terms, limited to at least 5 years, for example:

carbon accounting (53,800 results in Libraries Worldwide)

- [Towards net zero carbon emissions in the building industry](#) (2023) eBook
- [The economics of carbon accounting and carbon offsets](#) (2022) eBook
- [Handbook of accounting and sustainability](#) (2022) eBook
- [Routledge handbook of environmental accounting](#) (2021) eBook

climate risk management techniques (26,900 results in Libraries Worldwide)

- [Climate change adaptation, risk management and sustainable practices in the Himalaya](#) (2023) eBook
- [Water risk modeling: developing risk-return management techniques in finance and beyond](#) (2023) eBook
- [Climate Uncertainty and Risk: Rethinking Our Response](#) (2023) eBook
- [Drought Risk Management in Reflect Changing of Meteorological Conditions](#) (2022) eBook

climate policy (61,200 results in Libraries Worldwide)

- [Explaining transformative change in ASEAN and EU climate policy: multilevel problems, policies, and politics](#) (2023) eBook
- [Global Bank Lending under Climate Policy](#) (2022) eBook
- [Climate policy curves: linking policy choices to climate outcomes](#) (2022) eBook
- [The carbon club: how a network of influential climate skeptics, politicians and business leaders fought to control Australia's climate policy](#) (2020) eBook

These samples of titles using the same research terms, revealed that the Libraries' membership in the Big Ten Academic Alliance (BTAA) dramatically focuses these holdings and citations at about 6,900 results in Big Ten Academic Alliance. As with our own materials, students can request that chapters be copied from these BTAA books if the books are not available electronically.

Interlibrary Loan Services

Interlibrary Loan services (<https://www.lib.umd.edu/find/request/ILL>) provide online delivery of bibliographic materials that otherwise would not be available online. As a result, remote users who take online courses may find these services to be helpful. Interlibrary Loan services are available free of charge.

The article/chapter request service scans and delivers journal articles and book chapters within three business days of the request--provided that the items are available in print on the UM Libraries' shelves or in microform. In the event that the requested article or chapter is not available on campus, the request will be automatically forwarded to the Interlibrary Loan service (ILL). Interlibrary Loan is a service that enables borrowers to obtain online articles and book chapters from materials not held in the University System of Maryland.

Please note that one limitation of these services that might create some challenges, specifically for online remote access, is that the Libraries are not allowed to make online copies of entire books. The only way that a student can get access to a print copy of an entire book is to physically come to the Libraries and check out that book.

Additional Materials and Resources

In addition to serials, monographs and databases available through the University Libraries, students in the proposed program will have access to a wide range of media, datasets, software, and technology. Media in a variety of formats that can be utilized both on-site and via ELMS course media is available at McKeldin Library.

- GIS Datasets are available through the GIS Data Repository (<https://www.lib.umd.edu/research/services/gis>)
- Statistical Consulting and additional research support is available through the Research Commons (<https://www.lib.umd.edu/research>)
- Technology Support and Services are available through the Terrapin Learning Commons (<https://www.lib.umd.edu/visit/libraries/mckeldin/techdesk>).

- Open Educational Resources (OER) - educational materials and resources offered freely and openly for anyone to use, and the UMD Libraries strongly focus on creating Open-Source learning materials to support academic research, teaching, and learning.
<https://lib.guides.umd.edu/oer>
- Copyright and Author Rights - Provides a general overview of copyright issues for University of Maryland faculty and students. <https://lib.guides.umd.edu/copyright>

Subject Specialists Relevant to the MSCF Program

- **Business and Economics:**
 - Zaida Díaz zdiaz@umd.edu Business/Economics Librarian, 4227 McKeldin Library
 - Lily Griner griner@umd.edu Business/Economics Librarian, 4229 McKeldin Library
 - Charles (Chuck) LaHaie clahaie@umd.edu, Assistant Director, Financial Markets & Computing Lab/Labs, 4570J Van Munching Hall, RH Smith School of Business

Note: Zaida Díaz is a member of the Academic and Business Library Directors (ABLD, a professional business librarianship organization of top business school libraries in the U.S., and through it a member of the ABLD/AACSB Task Force. The Smith School is annually accredited by AACSB - The Association to Advance Collegiate Schools of Business - the foremost accreditation body of business schools in the world. Maryland Smith's Dean often sits on committees and task forces within AACSB and faculty and staff contribute and participate in AACSB affinity groups and conferences.

- **Environmental Sciences:** Isabella Baxter ibaxter@umd.edu Agriculture/AgEconomics, Environmental Sciences & Natural Resources Librarian, 2403M STEM Library
- **GIS and Geography Information Specialist:** Milan Budhathoki mb17@umd.edu 4120A McKeldin Library

Through departmental partnerships, subject specialists are an invaluable resource to programs such as the one proposed. They actively develop innovative services and materials that support the University's evolving academic programs and changing research interests, and provide one-on-one research consultation online, in-person, or via the phone. They also provide information literacy instruction and can provide answers to questions regarding publishing, copyright, open access and preserving digital works.

Other Research Collections and Trade Organizations

Because of the University's unique physical location near Washington D.C., Baltimore and Annapolis, the University of Maryland students and faculty have access to some of the finest libraries, archives, major trade associations and/or societies, government organizations, research centers, think tanks and watchdog organizations in the country that are vitally important for researchers in all areas of business, and other related disciplines. Among these are: Library of Congress, Bureau of Economic Analysis (BLS), U.S. Census Bureau (including the Business and Economic Census), Securities and Exchange Commission (SEC), World Bank/IMF, Federal Deposit Insurance Corporation (FDIC), Bureau of

Economic and Business Affairs (EB), Office of Commercial and Business Affairs (CBA), United States Chamber of Commerce (USCC), Securities Investor Protection Corp., Brookings Institution, National Science Foundation, Centers of Research Excellence in Science and Technology (CREST), International Finance Corporation, Center for International Policy, World Resources Institute, Environmental Protection Agency (EPA), Environmental Defense Fund (EDF), U.S. Green Building Council, Taxpayers for Common Sense (TCS), among many others.

Conclusion

With our journal holdings, monographs and databases, as well as additional support services and resources, at this point in time, our assessment is that the University of Maryland Libraries are able to currently meet the curricular and research needs of the proposed Master of Science in Climate Finance (MSCF) (In-Person: BMGT 904 and Online: BMGT 875).

However, it is important to note that every year we are faced with resource inflation costs and a finite budget allocation. The Libraries cannot guarantee that we will continue to have access to these resources in the near future. Although journal articles, books and book chapters can be requested and received via Interlibrary Loan (ILL), access to databases cannot be fulfilled this way.

Learning Outcomes

- Study the methodologies and data used to construct physical climate models and their outputs as well as integrated assessment models (IAMs) that leverage those outputs to generate socio-economic outputs for use in constructing financial and risk climate scenarios. The Climate Modeling and Analytic Tools and Science of Climate Change for Finance Professionals courses in the curriculum will provide students with the background to meet this learning outcome.
- Learn how to adapt and integrate standard financial models and data for portfolio and risk analysis with physical climate data on greenhouse gas emissions, natural hazard characteristics (e.g., hurricane frequency and intensity), and related information to make financial decisions including the valuation of projects and portfolios. Courses that support this learning objective include Valuing and Financing Climate Projects, Capital Markets, and Financial Management.
- Determine how to construct climate financial disclosures and evaluate a firm's physical and transition risk profile such as conducting a financed emissions analysis of a bank or evaluating the physical loss exposure to natural hazards in a loan portfolio. Courses that will facilitate this learning outcome include the Carbon Accounting and Financial Disclosures course and Climate Risk Management.
- Understand the economics and political economy of climate change policy and evaluate different potential regulatory policies such as the Paris Accords on Climate Change, feasibility and issues associated with carbon markets, prices and tariffs, as well as mitigation and adaptation strategies such as the prospect for geoengineering, issues associated with stranded assets as the global economy transitions to net zero carbon emissions strategies, among others. The Climate Change Policy and Regulation course will support this learning outcome.
- Learn and practice what risk management strategies and actions can be useful in identifying, measuring and mitigating risk exposure to physical and transition climate risks. This will include the use of catastrophe models for determining a firm's climate value-at-risk (VaR), surveying the use of and prospect for climate and weather derivatives to mitigate climate risk, insurance and reinsurance structures including the use of catastrophe bonds to mitigate risk, among other topics. The course, Climate Risk Management and the Climate ELP will support this learning objective.

Learning Assessment:

Each course in the curriculum is intended to provide students with the necessary concepts and empirical tools to conduct climate-related financial and risk analysis. A combination of periodic examination, case studies and experiential learning will be used

to assess student learning outcomes. Each student as part of the program will be expected to participate in a 2-credit Experiential Learning Program (ELP) that will provide a realistic team-based project that leverages each student's technical skills learned in their other coursework as well as cultivating their teamwork, communications and project management skills with senior leaders from sponsoring corporations or agencies on a specific climate-related problem.

Electives

BUFN 660 Derivative Securities

BUFN 650 Machine Learning in Finance

BUFN 732 Fixed Income Analysis

BUFN 781 Climate Risk Management

BUFN 782 Carbon Accounting and Financial Disclosures

BUFN 784 Climate Modeling and Analytic Tools

BUFN 785 Climate ALP

BUFN 787 Portfolio Analysis, Investment Strategies and Climate

One of the following:

BUFN 758L Fintech: Business Disruptions, Innovations and Opportunities

BUFN 758M Hedge Fund Management

BUFN 758X Market Microstructure