



Global Trade Analysis Project

GTAP Advisory Board Report

June 2022 – May 2023

Prepared by:

Center for Global Trade Analysis
Department of Agricultural Economics
Purdue University

Message from the Director



*Dominique van der
Mensbrugghe*

Director of GTAP

Dear GTAP Advisory Board Members,

We are very pleased to be having the GTAP Advisory Board Meeting and Conference in-person this year. Given the high attendance we expect at both events, we think this feeling is shared across board members and the GTAP community at large. We would like to warmly thank our host this year, the University of Bordeaux, with the leadership of Antoine Bouët, who has been doing triple duty since being appointed to lead CEPII, the prestigious economic research center in Paris and a long-standing board member.

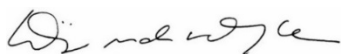
The biggest event for us this past year has been the public release of the GTAP 11 Data Base. The launch had been delayed for a number of reasons—mostly fine-tuning the data inputs and improving some of the adjustment procedures—but we are very proud of the final product. The improvements, relative to the last pre-release include a reprocessed input-output table for Vietnam, new bilateral trade estimates, new data on labor remuneration from the ILO, updated income and factor taxes from the IMF, updated procedures for emissions accounting, and updated services trade data from the WTO. Some of the satellite accounts have already been posted including GTAP-E, the non-CO₂ greenhouse gases, and air pollutant emissions. The latter have been merged into a single emissions file, which also includes process emissions and residual land use emissions (from burning of biomass). The remaining satellite accounts will be released after the conference. Please note that we have also made the MRIO version of the database available in a more traditional format (similar to WIOD’s format) for use by empirical trade economists utilizing the time series dimension of this data base. The Center continues working on nutrition accounts, including food losses and waste, biofuels, and the circular economy, and will provide a new satellite database incorporating estimates of ad valorem equivalents of non-tariff barriers with help from UNCTAD, and longtime board member, Ken Kawasaki. In addition, the Center received a new grant that will provide support to upgrade the livestock sectors in the data base to better support analyses of diets, nutrition, and climate mitigation. This work will include new splits of the sectors, multiple production technologies, and tracking of energy balances. We are also working on improved documentation of the build stream and streamlining our processes, including the use of parallel processing algorithms to accelerate the build. Work has begun on pre-release 1 of the GTAP 12 Data Base, which will have a reference year of 2019 (to pre-date the pandemic). We hope to provide this to board members during the first quarter of 2024.

On the modeling front, the Center continues work on GTAP-IAM—a fusion of GTAP-RD and GTAP-E, Power, and AEZ that will include a simple climate model and incorporate climate impacts to allow for GTAP users to undertake integrated assessment modeling. We are also pursuing work on GTAP-SR, a version of the standard GTAP model that integrates sub-regions, such as the states of the U.S. We are aware of other board members who have taken an interest in this approach, including members from Canada, China, and the UK. A third major modeling project involves implementing the GTAP Model in the open-source software, R. The core of the project is to build a TABLO compiler in R, which would then be solved using an R-based solver. All three modeling projects have significant financial support from key board members, and we are most appreciative of their vision and encouragement.

GTAP-U is firing on all cylinders and we will welcome a large contingent of participants to this year’s standard GTAP Short Course, being held here at Purdue for the first time since 2019. The GTAP Dynamic Short Course will similarly be held at Purdue this October. We are pursuing the conversion of all courses to use the GTAP Model, version 7, with the conversion of GTAP 101 nearly complete and GTAP-HET to be completed in early 2024. We will also be launching a new web-based application, open to the GTAP Network, to propose and instruct new specialized short courses—for example, a short course on GTAP-E or GTAP-IAM. We are developing the curriculum for a course on “GTAP for non-economists”—and have identified two tracks based on the board discussion from last June: 1) a course specifically focused on trade policy for policymakers, lawyers, and other non-economists working on trade agreements; and 2) a course tailored for non-economists working on multi-disciplinary projects that include GTAP-based analysis. Finally, the Center will be hosting the third offering of the SIMPLE-G interdisciplinary course in the spring of 2024. This introduces participants to gridded economic analysis of land and water sustainability challenges.

Your continued support is not something the Center takes for granted. We have lost some members over the last 12 months—mostly due to changing priorities and/or staffing, but we have also gained some new and returning board members. The annual GTAP Advisory Board Meeting is an opportunity for us to listen to your priorities and have them impact our work program, but we also listen to you year-round and look forward to working together over the next 12 months on critical global issues.

Sincerely,

A handwritten signature in black ink, appearing to read 'D. van der Mensbrugghe', written in a cursive style.

Dominique van der Mensbrugghe, Ph.D.
Research Professor and Director of GTAP
Center for Global Trade Analysis, Purdue University

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Executive Summary



Key Accomplishments

The list below highlights key accomplishments by the Center for Global Trade Analysis towards goals established during last year's GTAP Advisory Board Meeting.

Data Goal

- GTAP pre-release 4, incorporated feedback
- Journal paper and Final multi-year GTAP 11 releases.

Research Goal

- Actively participate in research projects, publish, and present papers in the areas of trade and development and global environmental issues
- *Journal of Global Economic Analysis* two releases in 2022

Model Goal

- GTAP-HS-TRQ - Implementation of TRQs using “ntuples”
- GTAP Integrated Assessment Model
- GTAPWiNDC - Embed WiNDC US subnational data and model into GTAP

Education Goal

- GTAP 101 Courses (2 offerings, 35 graduates, curriculum update underway)
- GTAP Short Course (1 offering, 23 graduates, shift back to hybrid format for 2023 course)
- GTAP Dynamic Short Course (not offered in 2022, shift back to hybrid format for 2023 course)
- GTAP PTA Course (1 offering, 5 graduates, curriculum update forthcoming for 2024 course)
- GTAP-HET Course (not offered in 2022, curriculum update underway for 2024 course)
- Other GTAP-U developments
 - New course proposal and review portal
 - Common module system and additional materials for instructors
 - New course development

Staffing Goal

- Research Economist annual review and career path protocol established
- Staff promotion/realignment within Purdue University HR system underway

Collaboration Goal

- GTAP Virtual Seminar Series (4 seminars, 223 attendees)
- 2023 GTAP Advisory Board Meeting and Conference (Bordeaux, France)
- 2024 GTAP Advisory Board Meeting and Conference (Fort Collins, Colorado, USA)
- 2025 GTAP Advisory Board Meeting and Conference (Kigali, Rwanda)
- 2026 GTAP Advisory Board Meeting and Conference (*tbd*)

Communication Goal

- JGEA software updated to use Open Journal System (OJS) 3
- Preliminary GTAP website redesign underway
- GTAP website login procedures overhauled for increased security

GTAP Advisory Board Meeting Agenda



Monday, June 12

Université de Bordeaux, Pey Berland (Room 1K)
35 Place Pey Berland, 33000 Bordeaux, France

Device Charging: Please come to the meeting with devices fully charged. The venue is an old building and outlets for charging will be few. Overloading these could cause a short circuit.

Time	Agenda Item
8:30-9:00	Welcome Coffee (Rm 1K)
9:00-10:30	Welcome and Overview (Chair: Paolo Giordano)
	9:00-9:30 Meeting Overview (Dominique van der Mensbrugge)
	9:30-10:00 Discussion
	10:00-10:10 GTAP Data Base (Angel Aguiar)
	10:10-10:30 Discussion
10:30-11:00	Break (Rm 1K)
11:00-12:20	GTAP Data Base: Component Updates (Chair: Elisa Lanzi)
	11:00-11:10 Non-tariff Measures (Erwin Corong and Ralf Peters)
	11:10-11:20 Discussion
	11:20-11:30 Food Loss and Waste (Maksym Chepeliev and Alessandro Gatto)
	11:30-11:40 Discussion
	11:40-11:50 Biofuels (Angel Aguiar)
	11:50-12:00 Discussion
	12:00-12:10 Energy and Emissions (Maksym Chepeliev)
	12:10-12:20 Discussion
12:20-13:30	Lunch (Rm 1K)
13:30-14:30	Education and Outreach (Chair: Janine Pelikan)
	13:30-13:45 GTAP-U (Zeynep Akgul)
	13:45-13:55 Discussion
	13:55-14:05 GLASSNET (Thomas Hertel)
	14:05-14:10 Discussion
	14:10-14:15 Journal of Global Economic Analysis (Thomas Hertel)
	14:15-14:20 Discussion
	14:20-14:25 CGTA Graduate Students (Thomas Hertel)
	14:25-14:30 Discussion
14:30-15:00	Break (Rm 1K)
15:00-16:00	New Developments at the Interface of Data and Modeling (Chair: Marika Santoro)
	15:00-15:10 CBAM Exposure Index (Maryla Maliszewska)
	15:10-15:20 Discussion
	15:20-15:30 Global Analysis of Water Scarcity with SIMPLE-G Global (Iman Haqiqi)
	15:30-15:40 Discussion
	15:40-15:55 Flash Session
	GTAP in R (Uris Baldos) New Model Links (Erwin Corong)
	MANAGE (van der Mensbrugge) Parallelization (van der Mensbrugge)
	15:55-16:00 Discussion
16:00-17:00	Parking Lot (Chair: Joseph Francois)
19:00	Dinner (Le Café Français, 5 Place Pey Berland, 33000 Bordeaux)

GTAP Advisory Board Meeting Agenda



Tuesday, June 13

Université de Bordeaux, Pey Berland (Room 1K)
35 Place Pey Berland, 33000 Bordeaux, France

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Time	Agenda Item
8:30-9:00	Welcome Coffee (Rm 1K)
9:00-10:00	GTAP Network (Chair: Stephen Karingi) <ul style="list-style-type: none">9:00-9:10 GTAP Research Fellows (Janine Pelikan)9:10-9:20 Discussion and Vote9:20-9:25 2023 Conference (Antoine Bouët)9:25-9:35 Discussion9:35-9:45 2024 Conference (Amanda Countryman)9:45-9:50 Discussion9:50-9:55 2025 Conference (Ginger Batta)9:55-10:00 Discussion
10:00-10:30	Break (Rm 1K)
10:30-11:30	New Developments at the Interface of Data and Modeling (Chair: Lars Nilsson) <ul style="list-style-type: none">10:30-10:50 Panel Discussion on Decoupling (William Powers, with board members)10:50-11:00 Discussion11:00-11:15 Trade and Inter-sectoral Labor Mobility (Shenjie Chen and Jingliang Xiao)11:15-11:30 Discussion
11:30-12:30	Priorities for Forthcoming Year (Chair: Jeffrey Condon) <ul style="list-style-type: none">11:30-11:40 Center Finances (Dominique van der Mensbrugge)11:40-11:50 Discussion11:50-12:15 Revisit Priorities for Next Year (Dominique van der Mensbrugge)12:15-12:30 Discussion
12:30-14:00	Lunch (Rm 1K)
14:00-15:00	Additional Meetings (Chair: Catherine Milot) <ul style="list-style-type: none">14:00-14:20 SSP Update (Elisa Lanzi and Rob Dellink)14:20-14:30 Discussion14:30-14:50 Recent Research on Trade Elasticities (Russell Hillberry)14:50-15:00 Discussion
15:00-17:00	Early Conference Check-in (Main Hall) We encourage those that registered to attend the conference to stop by the registration desk in the Main Hall during this time to collect conference materials and avoid the line Wednesday morning.



Improving the quality of quantitative analysis of global economic issues within an economy-wide framework



What is GTAP?

The Global Trade Analysis Project (GTAP) is a network of researchers and policy makers conducting quantitative analysis of international policy issues, with the goal of improving the quality of quantitative analysis of global economic issues within an economy-wide framework. Founded in 1992 by Thomas W. Hertel, GTAP has become the common "language" for conducting analysis of global policy issues, leading to GTAP-based results being influential in decision making around the world in trade, climate change, energy, and the environment.



Who is GTAP?

The Global Trade Analysis Project is coordinated by the [Center for Global Trade Analysis](#), which is housed in the [Department of Agricultural Economics](#) at [Purdue University](#).

GTAP is truly a global project with over 27,000 [network members](#) worldwide representing 179 different countries. The GTAP Network is intended to ease the transfer of skills and knowledge, foster the exchange of ideas among the applied general equilibrium community, and improve collaboration and encourage joined projects.



What does GTAP offer?

The centerpiece of the Global Trade Analysis Project is the [GTAP Data Base](#), a global data base describing bilateral trade patterns, production, consumption, and intermediate use of commodities and services. The GTAP Data Base is utilized by thousands worldwide and is a key input into contemporary applied general equilibrium analysis of global economic issues.

The underlying framework for the theory and structure for analysis come from two global general equilibrium models, the Standard and Dynamic [GTAP Models](#), which are developed and maintained by the Center for Global Trade Analysis.

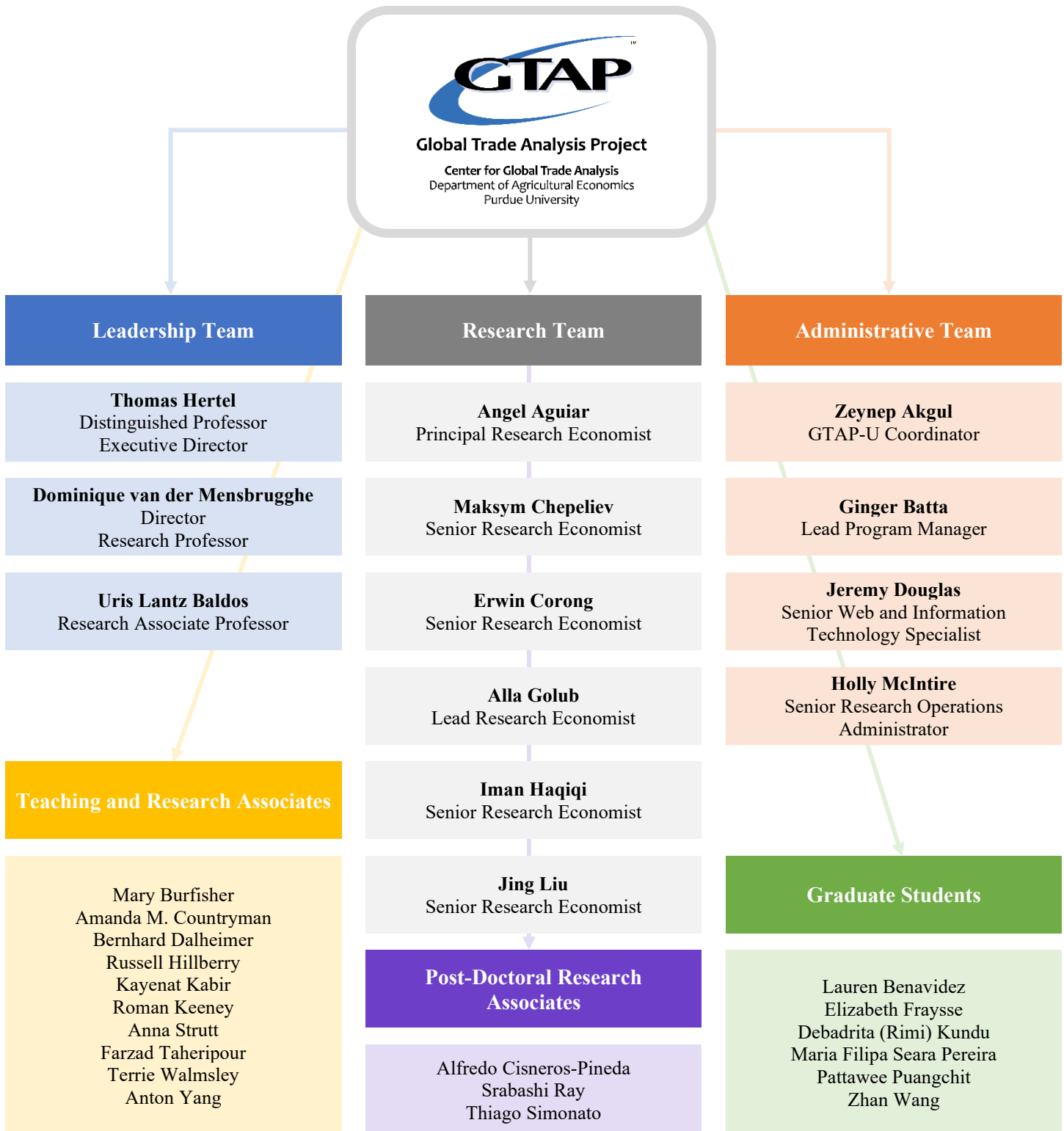
The Center for Global Trade Analysis also offers [events](#) and [courses](#) to help promote GTAP-based research, education, collaboration, and outreach, many of which have led to tens of thousands of citations to various GTAP-based research on [Google Scholar](#). In addition, the Center also publishes the [Journal of Global Economic Analysis](#), which provides an open access, peer-reviewed platform for publication and dissemination of innovations concerning applied general equilibrium modeling.

About GTAP

Center for Global Trade Analysis



GTAP is coordinated by the [Center for Global Trade Analysis](#), which was founded in 1992 by Thomas Hertel and is housed in the Department of Agricultural Economics at Purdue University.



About GTAP

In addition to the Center for Global Trade Analysis staff, GTAP relies heavily on a global network of CGE modelers and trade economists. These collaborators provide data and modeling expertise to help foster the Center's mission and goals.



Center Mission

To provide leadership in economic policy analysis by fostering collaboration to achieve better data and research outcomes.

We value:

- International collaboration because it increases quality of data and analysis.
- Objectivity and transparency because they are crucial to our data work and analysis.
- Discovery because improving methodology leads to better policy analysis.
- Learning because it creates critical vibrancy both within the Center and in the expanding network and improves the quality of analysis undertaken.
- Engagement because it helps us serve policy analysts and decision makers with better data and analysis.

We believe that:

- Better data leads to better policy analysis, which leads to better policy.
- Reconciling data makes data better.
- CGE modeling provides useful policy insights.
- Avoiding duplication in data production is efficient.
- Collaboration enhances individual efforts.
- Having more trained users enriches policy debates.



Center Goals

- **Data Goal:** To improve the quality of data products through:
 - improving the quality of contributed I-O data
 - addition and improvement of other datasets
 - monitoring of data quality using comparison programs
 - version control and documentation
- **Research Goal:** To actively participate in quantitative economic analysis of pressing global concern in the areas of trade and development and global environmental issues
- **Model Goal:** To promote further development of GTAP-based models
- **Education Goal:** To expand and improve education for global economic analysis worldwide
- **Staffing Goal:** To actively seek and encourage talented staff and graduate students
- **Collaboration Goal:** To actively seek opportunities for fostering collaboration with institutions around the world
- **Communication Goal:** To facilitate communication amongst members of the network as well as between the Center and key stakeholders

GTAP Consortium and Advisory Board



GTAP Consortium

Guidance and base-level support for the Global Trade Analysis Project is provided by the GTAP Consortium, which unites members from government agencies, international institutions, the private sector, and academia. Members of the consortium are represented on the GTAP Advisory Board, which advises the Center for Global Trade Analysis on matters of policy, research and funding.

Consortium Agency	Board Representative	Meeting Attendee
Asian Development Bank	Jong Woo Kang	<i>not represented</i>
Centre d'Etudes Prospectives et d'Information Internationales	Lionel Fontagné	Lionel Fontagné
Department for International Trade	Catherine Milot	Catherine Milot
Development Research Center of the State Council	Shantong Li	Shantong Li
Economic and Social Research Institute, Cabinet Office	Susumu Suzuki	Susumu Suzuki
Economic Research Institute for ASEAN and East Asia	Lurong Chen	Lurong Chen
Economic Research Service, United States Department of Agriculture	Jayson Beckman	Jayson Beckman
European Commission - DG Trade	Lars Nilsson	Lars Nilsson
European Commission - Joint Research Centre	Matthias Weitzel	Matthias Weitzel
Global Affairs Canada	Shenjie Chen	Shenjie Chen
Inter-American Development Bank	Paolo Giordano	Paolo Giordano
International Food Policy Research Institute	Will Martin	Will Martin
International Monetary Fund	Marika Santoro	Marika Santoro
International Trade Centre	Mondher Mimouni	<i>not represented</i>
KPMG International Services Limited	Laurent Creteigny	<i>not represented</i>
KPMG LLP (US)	John Pacilio	<i>not represented</i>
McKinsey & Company, Inc.	Jeffrey Condon	Jeffrey Condon
MIT Joint Program on the Science and Policy of Global Change	Sergey Paltsev	Sergey Paltsev
National Graduate Institute for Policy Studies	Kenichi Kawasaki	<i>not represented</i>
Organisation for Economic Co-operation and Development	Frank van Tongeren	Elisa Lanzi
The World Bank	Maryla Maliszewska	Maryla Maliszewska
Thünen Institute of Market Analysis	Janine Pelikan	Janine Pelikan
United Nations Conference on Trade and Development	Ralf Peters	Ralf Peters
United Nations Economic Commission for Africa	Stephen Karingi	Stephen Karingi
US Department of Commerce	Chris Rasmussen	Chris Rasmussen
US Environmental Protection Agency	Andrew Schreiber	<i>not represented</i>
US International Trade Commission	William Powers	William Powers
Wageningen Economic Research	Hans van Meijl	Heleen Bartelings
World Trade Organization	Eddy Bekkers	Eddy Bekkers
Member at Large	Joseph Francois	Joseph Francois
Member at Large	Mark Horridge	Mark Horridge
Member at Large	Brian O'Neill	<i>not represented</i>



Center Goals: Previous Year Progress Updates



Data Goal

To improve the quality of data products through improving the quality of contributed I-O data, adding and improving other datasets, monitoring data quality using comparison programs, and versioning control and documentation

Tasks	Responsibility
Primary Priorities	
Maintain pre-release schedule of GTAP 11 and its extensions	Aguiar
<i>Completed a 4th pre-release that included revised trade data and the energy subsidies, which are now default of the standard version. Incorporated feedback and produced the multi-year version of GTAP 11 for the public.</i>	
Work with IO table contributors	Aguiar
<i>Introduced new countries' IOTs (Haiti and Mali) and updated Ecuador. Developed a SAM to GTAP code with GAMS to facilitate contributions. Work with other UNECA sponsored contributors is ongoing towards GTAP 12.</i>	
Update energy and CO₂ emissions accounting in GTAP	Chepeliev
<i>Introduced updates to the energy data and CO₂ emissions for GTAP 11p4 and GTAP 11 for the public.</i>	
Update GTAP labor (wage and employment) data	Corong
<i>Updated wage and employment data for 70 countries using 2017 ILO data for GTAP v11 Data Base. For GTAPv12 data cycle, wage and employment data for reference years 2014 and 2019 will also be estimated.</i>	
Mainstreaming AEZ into GTAP	Corong
<i>Work on mainstreaming AEZ data into the GTAP data build will be implemented post GTAP v11 data cycle.</i>	
Mainstreaming GTAP-BIO Data Base development	Taheripour, Chepeliev, Aguiar, Sajedinia
<i>Introduced additional sectoral disaggregation to the GTAP 11 database for a refined representation of biofuels. Working on the development of the GTAP-BIO 11 database.</i>	
Secondary Priorities	
Prepare plan for GTAP 12	Aguiar
<i>After reference year has been determined to be 2019, we plan to improve the BOP representation with elements that we currently use in other extensions such as remittances and investment income.</i>	
Data / program separation	Corong
<i>For implementation in GTAP v12 data cycle. A complete overhaul of the data Build procedure will be undertaken to simplify previous processes and to replace make/gnumake/Cygwin and legacy software with Python for code readability while also taking advantage of parallel processing to reduce data Build runtime.</i>	
Mainstream/update circular economy database for GTAP 11	Chepeliev
<i>The work was focused on the introduction of additional splits to the GTAP-CE 10 database, including cement and green/conventional buildings. Have been working on data collections for splitting sectors in the GTAP-CE 11 database.</i>	

Tasks	Responsibility
Develop nutritional database with detailed representation of food loss and waste	Chepeliev
<i>A preliminary version of the GTAP 10 database with disaggregated food loss and waste along the global food supply chains has been produced. A work is ongoing for updating the database to version 11.</i>	
Improving disaggregation module	Aguiar
<i>No progress to report.</i>	

Center Goals: Previous Year Progress Updates



Research Goal

To actively participate in quantitative economic analysis of pressing global concern in the areas of trade and development and global environmental issues

Tasks	Responsibility
Primary Priorities	
Participate in research projects, publish, and present papers in the areas of trade and development and global environmental issues	CGTA Staff/Grads
<i>The Center remains active in research projects, publishing, and presenting. See Center Research Portfolio.</i>	
Competitive FTA Scenarios, “Natural” Trading Levels, and the Role of Trade in Climate Change and Environmental Shocks	Golub
<i>Calibration of a partial equilibrium global livestock-crop model to the ERS/USDA and OECD international baselines, and simulations of trade policy scenarios, such as the ASEAN-EU trade deal and EU-Mercosur Trade Agreement. Work is ongoing.</i>	
Using GTAP-BIO-W model to analyze transboundary waters conflicts and potential collaborative actions in the Middle East	Golub, Haqiqi, Taheripour
<i>Examine the extent to which climate change could limit the supply of water resources in the Middle East and estimate potential economic gains from collaboration in water management in the Tigris-Euphrates river basin and Saq-Ram aquifer. Completed.</i>	
Journal of Global Economic Analysis	Hertel
<p><i>The Journal of Global Economic Analysis published two issues in 2022. The June 2022 issue included two important papers documenting extensions to the GTAP data base – one focusing on the incorporation of nutritional accounts, and one providing a highly disaggregated treatment of the agro-food sectors in GTAP. The third paper in this issue introduced a methodology for endogenizing capital utilization in CGE models. The December 2022 issue contained four articles – two covering advances in data and parameters and two dealing with advances in theory and methods pertinent to CGE modeling. The first data base paper documented the GTAP 11 Data Base which has now been publicly released. The second paper in this area introduces a new methodology and software to allow users to estimate ad valorem equivalents associated with non-tariff barriers to trade. Both of these papers are foundational to future research on the global trading system. The methods papers dealt, in turn, with the mathematical foundations of the Melitz/Krugman/Armington classes of CGE models, and CGE trade modeling with asymmetric Armington functions. Both of these papers offer important alternatives to those seeking to model global trade flows in a CGE environment. The editorial board seeks to broaden the JGEA’s inclusion in journal rankings and indexes. This is particularly important for academics seeking promotion at their institutions. Suggestions are welcomed.</i></p> <p><i>Rankings and indexes that include the JGEA</i></p> <ul style="list-style-type: none"> • Scopus (ranked 88/869 in Economics and Econometrics) • SCImago Journal Rank (134/1216) • Research Papers in Economics (RePEc, 82/2820) • EconLit • Web of Science: Emerging Sources Citation Index (currently under evaluation for Social Sciences Citation Index) • Australian Business Deans Council Journal Quality List (B rating) 	

Center Goals: Previous Year Progress Updates



Model Goal

To promote further development of GTAP-based models

Tasks	Responsibility
<i>Primary Priorities</i>	
GTAP-HS-TRQ - Implementation of TRQs using “ntuples” to limit complementarity to only bilateral trade notes subject to TRQs	Golub
<i>Work is ongoing</i>	
GTAP-IAM - GTAP Integrated Assessment Model	Corong, van der Mensbrugghe
<i>A preliminary version of the model will be presented in the conference and will be made publicly available after the conference.</i>	
GTAPWiNDC - Embed WiNDC US subnational data and model into GTAP	Corong, Golub, van der Mensbrugghe
<i>Evaluated common sectoral aggregation schemes of the WiNDC and GTAP databases, and tested GTAPWiNDC database with the GAMS version of the GTAP-SR model. Work is ongoing to create a GEMPACK-based model.</i>	

Center Goals: Previous Year Progress Updates



Education Goal

To expand and improve education for global economic analysis worldwide

Tasks	Responsibility
Primary Priorities	
GTAP 101 Courses	Countryman, Batta, Akgul
<p><i>Two offerings of GTAP 101 were held since the last GTAP Advisory Board Meeting, producing 35 graduates. Demand for this course remains steady and graduates continue to feed into the other course offerings. From late 2022 through mid-2023, the GTAP 101 curriculum underwent a review with updates made to bring the content in line with the GTAP Model, v7 and the latest edition of Mary Burfisher's textbook, Introduction to Computable General Equilibrium Models, 3e. Updates are expected to be completed and launched for the 2023-2 offering.</i></p>	
GTAP Short Course	Keeney, Batta, Akgul
<p><i>One offering of GTAP Short Course was held since the last GTAP Advisory Board Meeting, producing 23 graduates. The 2022 course was held online, but the Center plans to return to a hybrid format in 2023 where students will complete eight weeks of asynchronous online learning before a week-long onsite residency at Purdue University.</i></p>	
GTAP Dynamic Short Course	Aguiar, Batta, Akgul
<p><i>The GTAP Dynamic Short Course was not held in 2022, but work commenced to finetune and adjust the curriculum developed for the last fully online course offered in 2021, for the 2023 offering which will return to a hybrid format where students will complete six weeks of asynchronous online learning before a week-long onsite residency at Purdue University.</i></p>	
GTAP PTA Course	Walmsley, Strutt, Batta, Akgul
<p><i>One offering of GTAP PTA was held since the last GTAP Advisory Board Meeting, producing 5 graduates. Demand for this course has declined and discussions have been held between the Center and course instructors on altering the frequency of offerings from annual to biennial. The GTAP PTA curriculum will undergo review and update for re-launch planned in 2024.</i></p>	
GTAP-HET Course	Akgul, Batta
<p><i>The GTAP-HET Course was not held in 2022 due to low application numbers. As with the GTAP 101 Course, the course content is being updated for re-launch in 2024.</i></p>	
SIMPLE-G Short Course	Liu
<p><i>The 2nd SIMPLE-G Short Course was held at Purdue University in May 2022. Thirteen participants from the US, Europe, Australia, and Brazil completed four weeks of online learning, followed by one week of in-person training to learn the SIMPLE and SIMPLE-G models. The course is expected to be offered again in 2024. A book on SIMPLE-G is being planned and prepared to be used in future courses.</i></p>	
New Course Proposal and Review System	Akgul, Douglas, Batta
<p><i>The GTAP website has been updated to include a course proposal submission and review system that allows external instructors to propose new courses to be hosted on the GTAP-U platform. The launch of the new system is scheduled for May 2023. To submit a proposal, interested instructors need to fill out a proposal form, attach a draft syllabus, and provide their CV. Each proposal will undergo a peer-review before approval.</i></p>	

Tasks	Responsibility
Common Module Repository System	Akgul, Douglas, Batta
<i>After each GTAP-U course, official post-mortems are conducted to plan content updates, which involve reviewing educational materials for content relevance and technical quality and categorizing them into relevant module libraries. Additionally, technical tutorials have been developed in GTAP 101 to support proficiency with RunGTAP, ViewHAR, ViewSOL, and AnalyseGE. As part of the module repository, these tutorials are intended to be implemented as the common technical review module in other GTAP-U courses.</i>	
Develop FAQ database for courses	Akgul
<i>To provide instructors with a helpful resource, we are currently developing a database of frequently asked questions (FAQs) for courses, which includes guidelines on how to answer commonly asked questions on discussion boards.</i>	
GTAP for Non-Economists Course	Akgul
<i>The development of the syllabus for the GTAP for Non-Economists course is currently underway, with the target of completing content development by 2024. The course is designed to introduce GTAP modeling to individuals without an economics background, with a focus on addressing a wider audience, facilitating communication, and interpreting results. The course will be fully-online, self-paced, and will be offered throughout the year.</i>	
GTAP-E-Power Course	Akgul
<i>The development of the syllabus for the fully-online, instructor-assisted GTAP-E-Power Course is currently underway. The targeted duration of the course is 6 weeks.</i>	

Center Goals: Previous Year Progress Updates



Staffing Goal

To actively seek and encourage talented staff and graduate students

Tasks	Responsibility
Primary Priorities	
Research Economist annual review and career path protocol established	van der Mensbrugge
<i>To complement the university's personnel evaluation system, the Center has established a structured approach for tracking the progress of the research economists that is similar in style to the 'promotions' document prepared by academic staff. This document will be used in the future for promotions.</i>	
Staff promotion/realignment within Purdue University HR system	van der Mensbrugge
<i>The Center has nearly completed a re-evaluation of staff positions within Purdue University's HR system, following the systemwide re-organization of 2019.</i>	

Center Goals: Previous Year Progress Updates



Collaboration Goal

To actively seek opportunities for fostering collaboration with institutions around the world

Tasks	Responsibility
Primary Priorities	
2023 GTAP Conference (Bordeaux, France)	Batta, van der Mensbrugge, Bouët
<i>The 2023 GTAP Conference will make its long-awaited return to an in-person event following three years of online conferences due to the pandemic. The Université de Bordeaux, Pey-Berland campus will host the GTAP Advisory Board Meeting and Conference June 12-14, and 14-6, respectively. An update on the conference will be presented during the board meeting.</i>	
2024 GTAP Conference (Fort Collins, Colorado, USA)	Batta, van der Mensbrugge, Countryman
<i>In February 2021, the GTAP Advisory Board approved moving the Colorado State University proposal from June 2021 to June 2024. A planning update will be presented during the board meeting. The conference program committee will meet during this year's conference to kick-off discussions on conference themes, plenary speakers, organized sessions topics, and potential funding sources.</i>	
2025 GTAP Conference (Kigali, Rwanda)	Batta, van der Mensbrugge, UNECA
<i>In June 2022, the GTAP Advisory Board approved moving the Kigali proposal from June 2022 to June 2025. A planning update will be presented during the board meeting.</i>	
2026 GTAP Conference (tbd)	Batta, van der Mensbrugge
<i>The Center has been in contact with a potential host for 2026. If they are willing to host, a proposal will be developed and circulated to the board for consideration in late 2023.</i>	
GTAP Virtual Seminar Series	Batta
<i>Four seminars were held since the last GTAP Advisory Board Meeting on the topics of Modelling Nutrition and Food Loss and Waste in a CGE Framework (68 attendees), New price-based bilateral ad-valorem equivalent estimates of non-tariff measures & Approaches to modelling non-tariff measures (21 attendees), A general equilibrium model with an asymmetric Armington function: Method and application (40 attendees), and the GTAP 11 Data Base (94 attendees).</i>	

Center Goals: Previous Year Progress Updates



Communication Goal

To facilitate communication amongst members of the network as well as between the Center and key stakeholders

Tasks	Responsibility
Primary Priorities	
Notable JGEA website updates	Douglas
<i>Updated the journal's software to use Open Journal System (OJS) 3, to keep up to the standards set forth by the OJS software team.</i>	
Notable GTAP website updates	Douglas
<i>We have begun the preliminary work on a redesign of the website to increase user interaction as well as be more mobile friendly. A new GTAP-U New Course Proposal system was built to handle all the requests for new course requests, allowing users of the website to propose new courses that they can teach to the other users. Behind the scenes we have updated how our users log into the website to facilitate better security and prevent unwanted access to the system. Website data for the past year can be accessed at:</i> https://www.gtap.agecon.purdue.edu/events/Board_Meetings/2023/documents/BoardReport_Website.pdf	

Center Goals: Forthcoming Year Action Items



Data Goal

To improve the quality of data products through improving the quality of contributed I-O data, adding and improving other datasets, monitoring data quality using comparison programs, and versioning control and documentation

Tasks	Responsibility
Primary Priorities	
Maintain pre-release schedule of GTAP 12	Aguiar
GMig and work with IO table contributors	Aguiar
Power extension	Chepeliev
Land use extension	Corong
GTAPAgg3	Corong, Horridge
Mainstream GTAP-BIO	Taheripour, Chepeliev, Aguiar, Sajedinia
Mainstream/update circular economy database for GTAP	Chepeliev
Merchandise trade	Gehlhar, Aguiar
Nutritional accounts and food loss and waste data for GTAP 11	Chepeliev, Gatto
Tariff data	Pichot, Aguiar
Secondary Priorities	
Update GTAP 12 labor data	Corong
Update energy data for GTAP 12	Chepeliev
Balancing routines to include agricultural production targeting	van der Mensbrugghe
Improve disaggregation routines	tbd

Center Goals: Forthcoming Year Action Items



Research Goal

To actively participate in quantitative economic analysis of pressing global concern in the areas of trade and development and global environmental issues

Tasks	Responsibility
Primary Priorities	
<i>Journal of Global Economic Analysis</i> – Continue building pipeline of potential papers for future issues and schedule of two issues per year (June/December)	Hertel
Competitive FTA Scenarios, “Natural” Trading Levels, and the Role of Trade in Climate Change and Environmental Shocks	Golub
Carbon Leakage Resulting from Afforestation in the UK	Golub, Baldos
Publish SIMPLE-G book. Hertel and Haqiqi are in discussions with Springer to publish a book documenting the SIMPLE-G modeling framework. It will follow the same format as the GTAP book, developing the economic theory, modeling framework, data and parameterization, followed by nine applications, each of which can be replicated via the accompanying files. This will serve the purpose of documenting the framework – thereby facilitating future publications, and the book will also serve as a foundation for future SIMPLE-G courses.	Hertel, Haqiqi
Participate in Phase 2 of the EAT-Lancet Diet study assessing the sustainability of the global agri-food system. This work is being done through the AgMIP Global Economic Modeling Team.	Chepeliev, van der Mensbrugghe
Assess the sustainability of the livestock production system with a focus on policies to promote circularity	Chepeliev, Golub, van der Mensbrugghe

Center Goals: Forthcoming Year Action Items



Model Goal

To promote further development of GTAP-based models

Tasks	Responsibility
<i>Primary Priorities</i>	
GTAP-SR (GTAPWiNDC): embedded WiNDC subnational data and model for the U.S. within global CGE GTAP framework.	Corong, Golub, van der Mensbrugge
Develop GEMPACK version of the GTAP-SR model and documentation, and conduct illustrative policy analysis.	Corong, Golub, van der Mensbrugge
GTAP-HS-TRQ - Implementation of TRQs using “ntuples” to limit complementarity to only bilateral trade notes subject to TRQs.	Golub
Extend the SIMPLE-G model to better utilize the GTAP Data Base. Iman Haqiqi is currently extending the SIMPLE-G model to incorporate production, consumption and trade data to match the GTAP crop categories. This will allow for future integration of SIMPLE-G into specialized versions of GTAP.	Haqiqi

Center Goals: Forthcoming Year Action Items



Education Goal

To expand and improve education for global economic analysis worldwide

Tasks	Responsibility
Primary Priorities	
2023 Course Delivery: <ul style="list-style-type: none"> • GTAP 101 Courses (March 20 - May 2 / September 4 - October 22) • GTAP Short Course (June 5 - August 11) • GTAP Dynamic Short Course (August 14 - October 13) 	Batta
Curriculum Updates: <ul style="list-style-type: none"> • identify materials that require updates • propose new course materials to fill any possible gaps in the course • develop/review new and updated course materials 	Akgul, Batta
Complete/Launch: <ul style="list-style-type: none"> • new course proposal and review system • module repository system <ul style="list-style-type: none"> ○ develop instructor guidelines for usage and access ○ new common module content developed (e.g., RunGTAP, FAQ data base, etc.) • systematic documentation of GTAP model extensions (two tracks – for instructors and for non-staff users) 	Akgul, Douglas
New Course Development: <ul style="list-style-type: none"> • Meet with instructors, board members, course participants and colleagues in the network to identify demand for core and specialized training in CGE modeling • Propose new course ideas and work with instructors to develop/implement <ul style="list-style-type: none"> ○ GTAP for Non-Economists Course ○ GTAP-E-Power Course 	Akgul
Secondary Priorities	
Quality Assessments: <ul style="list-style-type: none"> • Regular review of course content and technical quality • Carry out post-mortem meetings with lead course instructors • Report the status of courses at staff meetings 	Akgul
Report on the status and future directions of GTAP-U	Akgul

Center Goals: Forthcoming Year Action Items



Staffing Goal

To actively seek and encourage talented staff and graduate students

Tasks	Responsibility
<i>Primary Priorities</i>	
Hire new research professor	van der Mensbrugge

Center Goals: Forthcoming Year Action Items



Collaboration Goal

To actively seek opportunities for fostering collaboration with institutions around the world

Tasks	Responsibility
<i>Primary Priorities</i>	
2024 GTAP Conference (Fort Collins, Colorado, USA)	Batta, van der Mensbrugghe, Countryman
2025 GTAP Conference (Kigali, Rwanda)	Batta, van der Mensbrugghe, UNECA
2026 GTAP Conference (tbd)	Batta, van der Mensbrugghe
GTAP Virtual Seminar Series	Batta

Center Goals: Forthcoming Year Action Items



Communication Goal

To facilitate communication amongst members of the network as well as between the Center and key stakeholders

Tasks	Responsibility
<i>Primary Priorities</i>	
GTAP website redesign	Douglas



GTAP Data Base

The centerpiece of the Global Trade Analysis Project is a global data base describing bilateral trade patterns, production, consumption and intermediate use of commodities and services.

With the public release of GTAP 11, we now devote our attention to the satellite and extension distributions: GTAP-E, Power, MRIO, Land Use and Cover, GDYN and GMIG. We expect to have these completed in the next six months.

We continue to work on developing GTAP-BIO and GTAP Circular Economy satellite accounts. Nutritional accounts and other emissions are also expected for GTAP 11.

Towards GTAP 12, we have already started the collection process of macroeconomic data. But during the rest of the year, we will work with contributors of merchandise trade and tariffs towards the new reference year.

One of the novelties of GTAP 12 will be the inclusion of other balance of payment elements such as remittances and investment income, which we already introduce in the GMIG and GDYN extensions, respectively. We plan to also include Official Development Aid and continue to work into improving the reporting of Savings.

Another novelty relates to the use of manufacture output by UNIDO to be used in a similar way that we target agricultural production.

Also important is the need to continue to improve the labor and services trade inputs used and the procedures that we use to build GTAP.

Release Notes



GTAP Models

The Center for Global Trade Analysis oversees the development of two global general equilibrium models - the standard GTAP Model and its dynamic counterpart, GTAP-RD.

The model page of the GTAP website is being updated to help researchers download GTAP version 7 models. The link for each GTAP model-specific zip files (e.g., RunGTAP archive or stand-alone codes) and documents will become active as their corresponding version 11 satellite data is released

The GTAP Model was initially documented in the GTAP Book. Recent changes in the structure can be found below:

- [The Standard GTAP Model, Version 7](#), by Corong et al., Journal of Global Economic Analysis, 2017



[Standard GTAP Model v7 - Quick Reference Card](#)

- [Global Trade Analysis: Modeling and Applications](#), by T.W. Hertel (ed.)
- [A Graphical Exposition of the GTAP Model](#) by Brockmeier, Martina
- [A Note On Changes Since GTAP Book Model](#) by Itakura, K. and T. Hertel, 2000
- [A New Regional Household Demand System for GTAP](#) by McDougall, R., GTAP Working Paper No. 14, 2000
- [A General Welfare Decomposition for CGE Models](#) by Hanslow, K., GTAP Technical Paper No. 19, 2000
- [Decomposing Welfare Changes in GTAP](#) by Huff, K. and T. Hertel, GTAP Technical Paper No. 05, 2001
- [Two Small Extensions to SALTER](#) by McDougall, R., SALTER Working Paper Number 12, 1993
- [A Note on the CES Functional Form and Its Use in the GTAP Model](#) by Gohin, A. and T. Hertel
- [Notes on Final Demand in the Presence of Non-homothetic, Weak Separability](#) by Hertel, T.
- [References for GTAP Data Base and Model](#)

The model code is also available for download:

Model (version 7)	Current version		Documentation	Archives
	RunGTAP	Stand-alone		
Standard GTAP	download	download	download	download
GTAP-E	download	download	download	download
GTAP-MRIO	download	download	download	download

<https://www.gtap.agecon.purdue.edu/models/current.asp>

Center Research Portfolio



Research Projects

Center for Global Trade Analysis staff were awarded the following externally funded research projects during the past year.

Externally Funded Projects

Project Title:	<i>AccelNet: GLASSNET: Networking Global to Local Analyses to Inform Sustainable Investments in Land and Water Resources</i>
Sponsor:	NSF
Staff Involved:	Thomas Hertel, Jing Liu, Dominique van der Mensbrugge, Holly McIntire
Project Title:	<i>AFRI3 - Economic Foundations of Long Run Agricultural Sustainability</i>
Sponsor:	NIFA/USDA
Staff Involved:	Thomas Hertel, Iman Haqiqi, Jing Liu, Srabashi Ray
Project Title:	<i>Assessing the effects of environmental policy changes and agricultural resiliency on climate indicators and global food security: Converting the GTAP Model into an Integrated Assessment</i>
Sponsor:	USDA/ERS
Staff Involved:	Dominique van der Mensbrugge, Erwin Corong, Angel Aguiar
Project Title:	<i>Biofuel GHG Scenario Modeling</i>
Sponsor:	US EPA
Staff Involved:	Dominique van der Mensbrugge, Erwin Corong, Angel Aguiar, Maksym Chepeliev
Project Title:	<i>Carbon Leakage Resulting from Afforestation in the UK</i>
Sponsor:	University of Exeter
Staff Involved:	Alla Golub, Uris Baldos
Project Title:	<i>CGE Modelling for Serbia</i>
Sponsor:	LDK Consultants
Staff Involved:	Dominique van der Mensbrugge, Maksym Chepeliev
Project Title:	<i>CNH3-L: Uncovering Metacoupled Socio-Environmental Systems</i>
Sponsor:	MSU/NSF
Staff Involved:	Thomas Hertel, Jing Liu, Zhan Wang
Project Title:	<i>Circular Economy Transition and Green Buildings (Part 1 & 2)</i>
Sponsor:	The World Bank
Staff Involved:	Dominique van der Mensbrugge, Maksym Chepeliev
Project Title:	<i>Climate Impacts on Agricultural Markets: Enhancing Environmental Modeling Capabilities</i>
Sponsor:	USDA/ERS
Staff Involved:	Dominique van der Mensbrugge, Erwin Corong, Alla Golub

Project Title:	<i>Competitive FTA Scenarios, “Natural” Trading Levels, and the Role of Trade in Climate Change and Environmental Shocks</i>
Sponsor:	Virginia Tech
Staff Involved:	Alla Golub, Thomas Hertel
Project Title:	<i>Convert the GTAP model to be solved in R</i>
Sponsor:	USDA/ERS
Staff Involved:	Uris Baldos, Dominique van der Mensbrugghe, Thiago Cavalcante Simonato
Project Title:	<i>Decarbonizing the Electricity Grid and its Implications for US Agriculture: Challenges and Opportunities</i>
Sponsor:	Rutgers
Staff Involved:	Dominique van der Mensbrugghe, Maksym Chepeliev
Project Title:	<i>Framework: Data – HDR: Extensible Geospatial Data Framework Towards FAIR</i>
Sponsor:	NSF
Staff Involved:	Uris Baldos, Thomas Hertel
Project Title:	<i>Impacts of the Green Revolution of Global Food and Environmental Security</i>
Sponsor:	IFPRI
Staff Involved:	Uris Baldos
Project Title:	<i>INFEWS/T2: Identifying Sustainability Solutions through Global-Local-Global Analysis of a Coupled Water-Agriculture-Bioenergy System</i>
Sponsor:	NSF
Staff Involved:	Thomas Hertel, Jing Liu, Elizabeth Fraysse
Project Title:	<i>Innovations at the Nexus of Food, Energy, and Water Systems</i>
Sponsor:	NSF
Staff Involved:	Dominique van der Mensbrugghe
Project Title:	<i>Non-Tariff Measures in GTAP</i>
Sponsor:	UNCTAD
Staff Involved:	Erwin Corong
Project Title:	<i>Provision of interim releases of the GTAP Data Base for Economic Analysis</i>
Sponsor:	The World Bank
Staff Involved:	Dominique van der Mensbrugghe, Erwin Corong, Angel Aguiar, Maksym Chepeliev
Project Title:	<i>Trade and Climate Change Modeling</i>
Sponsor:	The World Bank
Staff Involved:	Dominique van der Mensbrugghe, Maksym Chepeliev
Project Title:	<i>WFP-Regional Economic Impact Study</i>
Sponsor:	Kagin Consulting
Staff Involved:	Dominique van der Mensbrugghe, Erwin Corong

Center Research Portfolio



Publications

Center for Global Trade Analysis staff published the following pieces during the past year.

- Anderson, K., E. Corong, A. Strutt, E. Valenzuela (2023). The Relative Importance of Global Agricultural Subsidies and Tariffs, Revisited. *World Trade Review* 22:2.
- Anderson, K., E. Corong, A. Strutt, E. Valenzuela (2023). The Relative Importance of Global Agricultural Subsidies and Tariffs, Revisited. Arndt-Corden Department of Economics (ACDE) Working Papers in Trade and Development No. 2023/03, Crawford School of Public Policy, Australian National University.
- Aguiar, A. H., Chepeliev, M., Corong, E. & van der Mensbrugghe, D. (2022). The Global Trade Analysis Project (GTAP) Data Base: Version 11. *Journal of Global Economic Analysis*, 7(2).
<https://jgea.org/ojs/index.php/jgea/article/view/181>
- Baldos, U., Chepeliev, M., Cultice, B., Huber, M., Meng, S., Ruane, A. C., Suttles, S., & van der Mensbrugghe, D. (2023). Global-to-local-to-Global Interactions and Climate Change. *Environmental Research Letters*.
<https://doi.org/10.1088/1748-9326/acc95c>
- Bekkers, E., E. Corong, J. Metivier, and D. Orlov (2023). “How will Trade Patterns Evolve in the Long Run”. Staff Working Paper ERS-2023-03. The World Trade Organization, Geneva.
- Busch, Jonah, Oyut Amarjargal, Farzad Taheripour, Kemen G. Austin, Rizki Nauli Siregar, Kellee Koenig, and Thomas W. Hertel. 2022. “Effects of Demand-Side Restrictions on High-Deforestation Palm Oil in Europe on Deforestation and Emissions in Indonesia.” *Environmental Research Letters* 17 (1): 014035. <https://doi.org/10.1088/1748-9326/ac435e>
- Chepeliev, M., Maliszewska, M., Seara e Pereira, M. 2023. The War in Ukraine, Food Security and the Role for Europe. *EuroChoices*, Issue 22(1). DOI: 10.1111/1746-692X.12389
- Chepeliev, M., Diachuk, O., Podolets, R., Semeniuk, A. 2023. Can Ukraine Go ‘Green’ on the Post-war Recovery Path? *Joule* (2023), March 01, 2023. <https://doi.org/10.1016/j.joule.2023.02.007>
- Chepeliev, M., Hertel, T., van der Mensbrugghe, D. 2022. Cutting Russia's fossil fuel exports: Short-term economic pain for long-term environmental gain. *The World Economy*. <https://doi.org/10.1111/twec.13301>
- Chepeliev, M. 2022. Incorporating Nutritional Accounts to the GTAP Data Base. *Journal of Global Economic Analysis*, 7(1), 1-43. doi: <https://doi.org/10.21642/JGEA.070101AF>
- Chepeliev, M. 2022. A Revised CO2 Emissions Database for GTAP. GTAP Research Memorandum No. 37.
https://www.gtap.agecon.purdue.edu/resources/res_display.asp?RecordID=6695
- Chepeliev, M, M Maliszewska and M Seara e Pereira. 2022, “Agricultural and energy importers in the developing world are hit hardest by the Ukraine war’s economic fallout”. *VoxEU.org*, 06 May 2022
<https://voxeu.org/article/developing-world-agricultural-and-energy-importers-hit-hardest-ukraine-war-economic-fallout>

- Chepeliev, M., Maliszewska, M., Osorio-Rodarte, I., Seara E Pereira, M.F., van der Mensbrugge, D. 2022. Globalisation, not localisation, is the key to post-pandemic prosperity. VoxEU Column. 30 May 2022. <https://cepr.org/voxeu/columns/globalisation-not-localisation-key-post-pandemic-prosperity>
- Clora, F., W. Yu, and E. Corong (2023). Alternative Carbon Border Adjustment Mechanisms in the European Union and International Responses: Aggregate and Within-Coalition Results. *Energy Policy* 174
- Cisneros-Pineda, J. Dukes, J. Johnson, S. Brouder, N. Rmakutty, E. Corong, A. Chaudhary. The Missing Link to Global-to-Local-to-Global Analyses of Biodiversity and Ecosystem Services. *Environmental Research Letters* 18:4.
- Fuglie, K.O., U.L.C. Baldos, S. Ray and T.W. Hertel. (2022) “The R&D Cost of Climate Mitigation in Agriculture”, *Applied Economic Perspectives and Policy*.
- Golub, A., B. Sohngen, Y. Cai, J. Kim, and T. Hertel. 2022. “Costs of forest carbon sequestration in the presence of climate change impacts”. *Environmental Research Letters*, 17(10):104011. <https://doi.org/10.1088/1748-9326/ac8ec5>
- Greig, A., Wu, Z. & Aguiar, A. H. (2023). Measuring the Sensitivity of the Northern Ireland Protocol on the All-Ireland Agri-Food Supply Chain. *The Economic and Social Review*, 54(1), 77–99. <https://www.esr.ie/article/view/2205>
- Haqiqi, I., Grogan, D. S., Bahalou, M., Liu, J., Baldos, U. L., Lammers, R. B., & Hertel, T. W. (2023). Local, regional, and global adaptations to a compound pandemic-weather stress event. *Environmental Research Letters*. 18 (3): 035005. <https://doi.org/10.1088/1748-9326/acbbe3>
- Haqiqi, I., Perry, C. J., & Hertel, T. W. (2022). When the virtual water runs out: local and global responses to addressing unsustainable groundwater consumption. *Water International*, 47(7), 1060-1084. <https://doi.org/10.1080/02508060.2023.2131272>
- Holtman, N., Aguiar, A. H. & Devadoss, S. (2022). The effects of freer trade on global agriculture. *Journal of the Agricultural and Applied Economics Association*, 1–13. doi:<https://doi.org/10.1002/jaa2.37>. eprint: <https://onlinelibrary.wiley.com/doi/pdf/10.1002/jaa2.37>
- Johnson, D. R., Geldner, N. B., Liu, J., Baldos, U. L., & Hertel, T. (2023). Reducing US biofuels requirements mitigates short-term impacts of global population and income growth on agricultural environmental outcomes. *Energy Policy*, 175, 113497. <https://doi.org/10.1016/j.enpol.2023.113497>
- Johnson, J. A., M. Brown, E. Corong, J. Dietrich, R. Henry, P. Jeetze, D. Leclere, A. Popp, S. Thakrar, D. Williams (2023). The Meso Scale as a Frontier in Interdisciplinary Modeling of Sustainability from Local to Global Scales. *Environmental Research Letters* 18:2.
- Kabir, Kayenat, Thomas W. Hertel and U.L.C. Baldos. (2022) “The New Malthusian Challenge in the Sahel: Prospects for Improving Food Security in Niger”, *Food Security* <https://doi.org/10.1007/s12571-022-01319-3>
- Ordenez, Brayam Valqui, Mort D. Webster, Shanxia Sun, and Thomas W. Hertel. 2022. “Technology Adoption in Electricity Markets: Game-Theoretic Framework Approach for Coupling Market Models”, *Energy Journal* doi: 10.5547/01956574.44.4.bval
- Ray, S., Haqiqi, I., Hill, A. E., Taylor, J. E., & Hertel, T. W. (2023). Labor markets: A critical link between global-local shocks and their impact on agriculture. *Environmental Research Letters*. <https://doi.org/10.1088/1748-9326/acb1c9>
- S. Noia Júnior, Rogerio de, Frank Ewert, Heidi Webber, Pierre Martre, Thomas W. Hertel, Martin K. van Ittersum and Senthold Asseng (2022). “Needed global wheat stock and crop management in response to the war in Ukraine”, *Global Food Security* <https://doi.org/10.1016/j.gfs.2022.100662>

Saeed, W., Haqiqi, I., Kong, Q., Huber, M., Buzan, J.R., Chonabayashi, S., Motohashi, K. and Hertel, T.W., (2022). The Poverty Impacts of Labor Heat Stress in West Africa Under a Warming Climate. *Earth's Future*, 10(11), p.e2022EF002777. <https://doi.org/10.1029/2022EF002777>

Woo, J., Zhao, L., Grogan, D. , Haqiqi, I., Lammers, R., & Song, C. (2022). C3F: Collaborative Container-based Model Coupling Framework. *Practice and Experience in Advanced Research Computing*, 1–8. <https://doi.org/10.1145/3491418.3530298>

World Bank. 2023. “Squaring the Circle: Policies from Europe’s Circular Economy Transition”. Washington, D.C.: World Bank Group, January 2023. <https://documents1.worldbank.org/curated/en/09942500622229520/pdf/P174596025fa8105a091c50fb22f0596fd1.pdf> Chepeliev and van der Mensbrugge contributed to Chapters 3 and 5.

Center Research Portfolio



Presentations

Center for Global Trade Analysis staff presented the following during the past year.

- Chepeliev, M., Hertel, T., and van der Mensbrugghe D. (2022). Warsaw School of Economics Webinar, May 19, 2022. “Cutting Russia’s fossil-fuel exports: Short-term (economic) pain for long-term (environmental) gain”.
- Chepeliev, M., Baldos, U., Haqiqi, I., Hertel, T., Liu, J., and van der Mensbrugghe, D. (2022) Association of Environmental and Resource Economists (AERE) Summer Conference, June 1-3, 2022, Miami, Florida, USA. “Multi-scale analysis of U.S. climate policy: Gridded implications for land systems change, water use, and nitrogen leaching”.
- Baldos, U. L. C. (2022). U.S. climate policy revisited: Implications for land systems change, water use, and nitrogen leaching. 25th Annual Conference on Global Economic Analysis, Virtual Meeting.
- Anderson, K., E. Corong, A. Strutt (2022). The GTAP-DS (Domestic Support) Model. Presented during the 25th Annual Conference on Global Economic Analysis.
- Antimiani A. and E. Corong (2022). Trade Policy and Land Use Impact. Presented during the 25th Annual Conference on Global Economic Analysis.
- Anderson, K., E. Corong, A. Strutt, and E. Valenzuela (2022). The Relative Importance of Global Agricultural Subsidies and Market Access, Revisited. Presented during the 25th Annual Conference on Global Economic Analysis.
- Balagtas, J. and E. Corong (2022). Trade Creation and Trade Diversion from the Phase 1 Trade Agreement for Agriculture. Presented during the 25th Annual Conference on Global Economic Analysis.
- Chepeliev, M., Aguiar, A., Farole, T., Liverani, A., and van der Mensbrugghe, D. (2022). 25th Annual Conference on Global Economic Analysis (Virtual Conference). “EU Green Deal and Circular Economy Transition: Impacts and Interactions.”, June 8-10, 2022.
- Chepeliev, M. and Corong E. (2022). 25th Annual Conference on Global Economic Analysis (Virtual Conference). “Revisiting the environmental bias of trade policies based on an environmentally extended GTAP MRIO Data Base.”, June 8-10, 2022.
- Wang, Z. (2022, June 8-10). *Transportation Cost, Agricultural Production and Cropland Expansion in Brazil: A Multi-scale Analysis* [Conference session]. GTAP 25th Annual Conference, online. <https://ageconsearch.umn.edu/record/333501/>
- Corong E. (2022). Modular Source Code for GTAP version 7 models. Presented during the 25th Annual Conference on Global Economic Analysis
- Golub, A., I. Haqiqi, O. Karami, E. Sajedinia, and F. Taheripour. “Transboundary Water Challenges and Potential Collaboration in the Tigris-Euphrates River Basin Water Management”. Selected paper presented by Alla Golub at the 25th Annual Conference on Global Economic Analysis, virtual, June 8-10, 2022.
- Hertel, Thomas W. “Agricultural Trade and Sustainability: Global to Local to Global Analysis”, presentation to the OECD Workshop on Agricultural Trade and Sustainability, June 16, 2022 (virtual).

- Chepeliev, M., Aguiar, A., Farole, T., Liverani, A., and van der Mensbrugge, D. (2022) Forum on Scenarios for Climate and Societal Futures. June 20-22, Session No. 37. “Climate Mitigation and Circular Economy Transition in Europe: Impacts and Interactions.”, Virtual Poster.
- Chepeliev, M. (2022) Served as a discussant in the GLASSNET Use Case Summer Workshop Series “Net Zero Plus – Creating the UK’s New Woodlands”, June 21, 2022. <https://www.youtube.com/watch?v=-jrUHL6ou44>
- Hertel, Thomas W. “Food Security in the Context of Multiple Crises”, plenary panel presentation on the occasion of the 30th Anniversary of the Potsdam Institute for Climate Research (PIK), Potsdam, Germany, June 30, 2022.
- Hertel, Thomas W. “Global-Local-Global Analysis of Sustainability Challenges”, institute-wide research seminar at the Potsdam Institute for Climate Research (PIK), Potsdam, Germany, July 12, 2022.
- Chepeliev, M. (2022) Purdue Farm Policy Study Group meeting, Beck Agricultural Center, Purdue University, July 12, 2022. “Economic and Agricultural Impacts of the Russian Invasion of Ukraine.” Based on the joint work with Thomas Hertel, Maryla Maliszewska, Aaditya Mattoo, Michele Ruta, Maria Filipa Seara e Pereira, and Dominique van der Mensbrugge
- Hertel, Thomas W. “The Poverty Impacts of Labor Heat Stress in West Africa under a Warming Climate”, seminar presented to the climate impacts and health group at the Potsdam Institute for Climate Research (PIK), Potsdam, Germany, July 19, 2022.
- Golub, A., I. Haqiqi, O. Karami, E. Sajedinia, and F. Taheripour. “Transboundary Water Challenges and Potential Collaboration in the Tigris-Euphrates River Basin Water Management”. Selected paper presented by Alla Golub at the 2022 Agricultural and Applied Economics Association Annual Meeting, Anaheim, CA, USA and virtual, July 31-August 2, 2022.
- Baldos, U. L. C. (2022). Investing in Public R&D for a Competitive and Sustainable US agriculture. 2022 AAEA Annual Meeting, Virtual Presentation.
- Baldos, U. L. C. (2022). Improving ‘GTAP in R’ package. USDA-ERS Productivity Workshop - Virtual, Virtual Presentation.
- Wang, Z. (2022, July 31 - August 2). *Impact of China's South-North Water Transfer Project on Agriculture: A Multi-scale Analysis of the Food-Land-Water System* [Conference session]. AAEA Annual Meeting China Section, Anaheim, CA, United States.
- Wang, Z. (2022, July 31 - August 2). *Climate Change, Irrigation Expansion and Impacts on Agriculture Production: An Integrated Multi-Scale Analysis of Brazil by 2050*. [Conference session]. AAEA Annual Meeting, Anaheim, CA, United States. <https://ageconsearch.umn.edu/record/322560/>
- Chepeliev, M. (2022) University of Sydney Virtual Lecture, August 9, 2022. “Russian Invasion of Ukraine: Commodity Market Distortions and Energy Bans”. Based on the joint work with Oleksandr Diachuk, Thomas Hertel, Maryla Maliszewska, Aaditya Mattoo, Michele Ruta, Maria Filipa Seara e Pereira, Roman Podolets, Andrii Semeniuk, and Dominique van der Mensbrugge
- Hertel, Thomas W. “North-South Relations – Global and Regional Sustainability Strategies”, seminar presented at the Haus der Wissenschaft, Bremen, Germany, August 18, 2022.
- Chepeliev, M., Baldos, U., Haqiqi, I., Hertel, T., Johnson, D., Kucharik, C., Liu, J., van der Mensbrugge, D., Wollheim, W., and Zuidema, S. (2022). Midwest Climate Workshop, September 12-13, 2022, West Lafayette, Indiana. “US climate policy can contribute to improved water quality and reduce hypoxia in the Gulf of Mexico.”

- Corong, A., A. Golub, T. Rutherford, and D. van der Mensbrugge. “Embedding the WiNDC subnational data for the U.S. within the GTAP framework”. Presented by Alla Golub at the USDA “Productivity and Modeling” workshop, virtual platform, September 16, 2022.
- Golub, A., B. Sohngen, Y. Cai, J. Kim, and T. Hertel. “Costs of forest carbon sequestration in the presence of climate impacts”. Presented by Alla Golub at the USDA Carbon Sinks Modeling Forum, Atlanta, GA, September 21-23, 2022. <https://farmfoundation.swoogo.com/usdacarbonsinks/2036072>
- Hertel, Thomas W. “Global-Local-Global Analysis of Sustainability Challenges”, seminar at the Center for Development Studies, University of Bonn, Germany, September 27, 2022.
- Hertel, Thomas W. “Global-Local-Global Analysis of Sustainability Challenges”, workshop at the Stockholm Resilience Center, Sweden, October 3, 2022.
- Hertel, Thomas W. “Multi-scale analysis of U.S. climate policy: Gridded implications for land systems change, nitrogen fertilizer leaching and water quality”, European Association of Agricultural Economics Seminar, Humboldt University, Berlin, Germany, October 6, 2022.
- Hertel, Thomas W. “Global-Local-Global Analysis of Land and Water Sustainability”, Seminar for the Department of Agricultural Economics, University of Copenhagen, October 11, 2022.
- Hertel, Thomas W. “SIMPLE-G: A Framework for Global-Local-Global Analysis of Sustainability”, workshop at the Leibniz Center for Agricultural Landscape Research”, Muencheberg, Germany, October 20, 2022.
- Hertel, Thomas W. “Multi-scale Analysis of Nitrogen Loss Mitigation and Climate Policies in the US Corn Belt”, institute-wide lecture at the Leibniz Center for Agricultural Landscape Research”, Muencheberg, Germany, October 20, 2022.
- Hertel, Thomas W. “Diversification for Agri-Food System Resilience”, virtual presentation to the FAO Conference on Science, Technology and Innovation, October 20, 2022.
- Hertel, Thomas W. “Global-Local-Global Analysis of Land and Water Sustainability”, Institute-wide seminar at the Helmholtz Center for Environment Research, Leipzig, Germany, October 24, 2022.
- Hertel, Thomas W. “Global-Local-Global Analysis of Land and Water Sustainability”, Institute-wide seminar at the Thuenen Institute, Braunschweig, Germany, November 2, 2022.
- Hertel, Thomas W. “Evidence-based Economic Models, Data and Research Institutions to Tackle Future Challenges”, 25th Annual Rossi-Dorria Lecture, Rome-Tre University, Italy, November 17, 2022.
- Chepeliev, M. International Monetary Fund workshop. “Cutting Russia’s fossil-fuel exports: Short-term economic pain for long-term environmental gain (and Ukraine’s recovery challenge).” November 18, 2022. Based on the joint work with Thomas Hertel, Dominique van der Mensbrugge, Oleksandr Diachuk, Roman Podolets, and Andrii Semeniuk.
- Hertel, Thomas W. “Forging international, interdisciplinary collaborations to address global challenges”, presentation to the Annual Meeting of the Leibniz Association, Berlin, November 23, 2022.
- Hertel, Thomas W. “Global-Local-Global Analysis of Land and Water Sustainability”, Institute of Agricultural Trade and Development, Humboldt University, Berlin, Germany, November 30, 2022.
- Chepeliev, M., Aguiar, A., Farole, T., Liverani, A., and van der Mensbrugge, D. (2022). Fifteenth Integrated Assessment Modeling Consortium (IAMC) Annual Meeting 2022. “Circular Economy Transition in Europe Requires Ambitious Policies Beyond Climate Mitigation.”. December 1, 2022.

- Chepeliev, M. (2022). World Bank Virtual Seminar. “Russian invasion of Ukraine: energy bans, commodity market distortions, and Ukraine's recovery challenge”. December 7, 2022. Based on the joint work with Thomas Hertel, Maryla Maliszewska, Aaditya Mattoo, Michele Ruta, Maria Filipa Seara e Pereira, Dominique van der Mensbrugge, Oleksandr Diachuk, Roman Podolets, and Andrii Semeniuk.
- Hertel, Thomas W. “Global-Local-Global Analysis of Groundwater Scarcity”, Department of Geography and IRI-THESys, Humboldt University, Berlin, Germany, December 9, 2022.
- Chepeliev, M., Maliszewska, M., Filipa Seara e Pereira, M. (2022). International Agricultural Trade Research Consortium that was held during December 11-13, 2022 at Clearwater Beach, FL. “The War in Ukraine Disrupts Agricultural Value Chains, but Trade Policy Measures Can Mitigate the Impacts”.
- Golub, A., Haqiqi, I., Karami, O., Sajedinia, E., Taheripour, F. (2022). Transboundary Water Challenges and Potential Collaboration in the Tigris-Euphrates River Basin Water Management. American Geophysical Union, AGU Fall Meeting, Chicago, IL, 12-16 December 2022.
- Haqiqi, Iman. (2022). Global Drivers of US Groundwater Stresses and Global Responses to US Groundwater Policies. American Geophysical Union, AGU Fall Meeting, Chicago, IL, 12-16 December 2022.
- Haqiqi, Iman. (2022). SIMPLE-G: Integrating Spatially and Temporally Heterogeneous Data to Inform a Multi-Scale and Multi-System Framework of Sustainability and Food Security. American Geophysical Union, AGU Fall Meeting, Chicago, IL, 12-16 December 2022.
- Song, C., Woo, J., Zhao, L., Grogan, D., Haqiqi, I., Lammers, R. (2022). Accelerating Multi-scale Cross-domain Model Linking Using Advanced Cyberinfrastructure. American Geophysical Union, AGU Fall Meeting, Chicago, IL, 12-16 December 2022.
- Taheripour, F., I. Haqiqi, A. Golub, E. Sajedinia, and O. Karami. “Transboundary Water Challenges and Potential Collaboration in the Tigris-Euphrates River Basin Water Management”. Selected poster presented by Alla Golub at the American Geophysical Union 2022 Fall Meeting, Chicago, IL, USA, and virtual, December 12-16, 2022. Link to poster: agu2022fallmeeting-agu.ipostersessions.com/Default.aspx?s=1C-01-FB-82-D1-CD-2B-B7-CD-00-95-7F-90-76-02-CE
- Wang, Z. (2022, December 12-16). *Transport Infrastructure Expansion in Brazil: A Win-Win Strategy for Agriculture Competitiveness and Environment?* [Poster session] AGU Fall Meeting 2022, Chicago, IL, United States. <https://agu.confex.com/agu/fm22/meetingapp.cgi/Paper/1114161>
- Hertel, Thomas W. “The GTAP Consortium: Lessons Learned and Guidance for the FABLE Consortium”, address given to the FABLE Consortium meeting, December 13, 2022.
- Hertel, T.W., based on joint work with U.L.C. Baldos, “Food and Environmental Security in an Era of Globalization”, seminar presented at the Humboldt University Department of Geography, December 15, 2022.
- Chepeliev, M. (2022). International Workshop on Global Integrated Assessment Model (IAM) Development and Climate Policy Research, Seoul, Korea, December 27, 2022. The workshop is co-organized by Yonsei University, Korea Environment Institute, and the Department of Climate, Environment, Energy, Sookmyung Women’s University, Korea. “Lessons from linking general equilibrium and partial equilibrium models: cases of energy, agriculture, environmental services, and income distribution” (online presentation).
- Anderson, A., E. Corong and A. Strutt (2023). The GTAP-DS Model. The 67th Annual Conference of the Australasian Agricultural and Resource Economics Society. 7-10 February 2023, Christchurch, New Zealand.
- Hertel, Thomas W. “Global-Local-Global Analysis of Land and Water Sustainability”, Invited address to the annual meetings of the Australasian Agricultural and Resource Economics Society, (virtual), February 8, 2023.

- Chepeliev, M. Maliszewska, M, and Wen Jin “Jean” Yuan (2023). The United States International Trade Commission (U.S. ITC) Webinar, February 27, 2023. “Climate Mitigation Policies, Comparative Advantage in International Trade, and the Restructuring of Global Value Chains (GVCs)”.
- Chepeliev M. and van der Mensbrugghe, D. (2023). Wageningen University and Research (WUR). Workshop on Modelling healthy diets from sustainable food systems: EAT-Lancet 2.0. Haag, Netherlands, March 9-10. Presented “GTAP Nutritional Accounts: Challenges and Data Gaps”.
- Hertel, Thomas W. “Global-Local-Global Analysis of Land and Water Sustainability”, Seminar at ERS/USDA, Washington, D.C., March 15, 2023.
- Hertel, Thomas W. “Global-Local-Global Analysis of Sustainability”, Seminar at IFPRI, Washington, D.C., March 16, 2023.
- Wang, Z. (2023, March 20). Transport Infrastructure Expansion in Brazil: A Win-Win Strategy for Agriculture Competitiveness and Environment? [Webinar presentation]. GLASSNET Webinar, online.
<https://www.youtube.com/watch?v=qSA31yOgTeg>
- Corong, E. (2023). GTAP Model source code. USDA-ERS Modeling Summit. 1 April 2023, Kansas City.

Center Research Portfolio



Awards

Center for Global Trade Analysis staff were presented with the following awards during the past year.

Thomas Hertel

- Distinguished Fellow - Australasian Agricultural and Resource Economics Society