

# MARINA VICENS-MIQUEL

Texas A&M University–Corpus Christi (TAMUCC)  
Department of Computer Science  
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## EDUCATION

- Ph.D. Texas A&M University–Corpus Christi, expected 2024  
Geospatial Computer Science Ph.D. Program GPA: **3.93**
- B.S. Texas A&M University–Corpus Christi, May 2020  
Double Major: Computer Science, Mathematics  
*Magna Cum Laude* GPA: **3.85**

## RESEARCH EXPERIENCE

- 2020 – Current **Graduate Research Assistant at the NSF AI Institute for Research on Trustworthy AI in Weather, Climate, and Coastal Oceanography (AI2ES) and Conrad Blucher Institute at TAMUCC**  
*Principal Researchers:* Drs. P. Tissot & A. Medrano (TAMU-CC and AI2ES; Co-Advisors)

### Deep Learning for Coastal Inundation Predictions

- Development of an AI operational real-time coastal inundation model for Horace Caldwell Pier, Port Aransas, TX.
- Working collaboratively with Nueces County and local National Weather Service office, who will use the real-time predictions.

### Deep Learning to Predict Cold-Stunning Events in Southern Texas

- Development of an AI operational real-time model to improve stakeholder decision-making concerning sea turtle and fisheries conservation efforts during freeze events along the Texas coast.

### Analysis of Sandy Beach Morphology Changes from a High Spatiotemporal Resolution Dataset

- Analysis of the beach morphology changes.
- Working collaboratively with the city of Port Aransas, who will use this information to implement the necessary conservation measures.

### Comparison of Deep Learning Methods for Coastal Water Level Predictions

- Development and DL operation real-time model to predict water level at multiple locations along the Texas coast to be used as inputs for a coastal inundation real-time model.
- Performance comparison of multiple DL architectures from MLP, to Seq2Seq, to multiple Transformer architectures.

### A 10-Year Metocean Dataset for Laguna Madre, Texas Including for the Study of Extreme Cold Events

- Creation of a newly imputed 10-year metocean dataset representative of the Laguna Madre and development of publicly available repository applicable for AI implementation by wide-audiences.

- Applied to the Cold-Stunning model used for sufficient sea turtle recovery efforts.

Implementation of a Zed 2i Stereo Camera for High-Frequency Shoreline Change and Coastal Elevation Monitoring

- Creation and georeferencing of DEM products from stereo imagery to monitor coastal inundation.
- Accuracy comparison between UAS and photogrammetry methods for DEM products.

A Deep Learning Based Method to Delineate the Wet/Dry Shoreline and Compute Its Elevation Using High-Resolution UAS Imagery

- Development of a modified edge detection architecture to detect the wet/dry shoreline using UAS imagery and extract the elevation by superimposing the imagery on the top of DEM.
- Used as the ground truth of the position of the wet/dry shoreline to predict inundation events.

Summer 2023

**Research Collaborator at the University of Valencia, Spain**

Towards Resilient Coastal Management: Supervised Learning for Seasonal to Multi-Year Water Level Predictions in Texas Gulf Coast

*Principal Researcher: Dr. V. Nieves (Univ. of Valencia, Committee Chair)*

- Implementation of an AI operational real-time sub-seasonal to multi-year water level model for the entire Texas Gulf Coast.
- Predictions will be used by authorities to implement necessary measures to mitigate flood effects.

2020

**Research Intern at Lone Star UAS Center (LSUASC)**

Research in UAV Damage Assessment using Deep Learning

*Principal Researcher: J. Boyd (LSUASC)*

- Use of computer vision approach to detect and quantify damage assessment of buildings after various natural disasters.

## JOURNAL PUBLICATIONS

- 2023      **Vicens-Miquel, M.;** White, M.; Tissot, P.; Medrano, A. *Deep Learning to Predict Cold-Stunning Events in Southern Texas*. In preparation.
- 2023      **Vicens-Miquel, M.;** Tissot, P.; Williams, D.; Medrano, A. *Analysis of Sandy Beach Morphology Changes from a High Spatial Temporal Resolution Dataset*. In preparation.
- 2023      **Vicens-Miquel, M.;** Radin, C.; Nieves, V.; Tissot, P.; Medrano, A. *Towards Resilient Coastal Management: Supervised Learning for Seasonal to Multi-Year Water Level Predictions in Texas Gulf Coast*. Coastal Engineering. In preparation.
- 2023      **Vicens-Miquel, M.;** Tissot, P.; Medrano, A. *Deep Learning Methods for Coastal Water Level Predictions*. Artificial Intelligence for the Earth Systems. Under review.

- 2023 White, M.; **Vicens-Miquel, M.**; Tissot, P.; Krell, E. *A 10-Year Metocean Dataset for Laguna Madre, Texas Including for the Study of Extreme Cold Events*. Data in Brief. Accepted.
- 2022 **Vicens-Miquel, M.**; Medrano, A.; Tissot, P.; Kamangir, H.; Starek, M. A *Deep Learning Based Method to Delineate the Wet/Dry Shoreline and Compute its Elevation Using High-Resolution UAS Imagery*. Remote Sensing MDPI. 14(23), 5990. DOI: [10.3390/rs14235990](https://doi.org/10.3390/rs14235990).

### CONFERENCE PROCEEDINGS (Peer Reviewed)

- 2023 Pilartes-Congo, J.; Kastl, M.; Starek, M.; **Vicens-Miquel, M.**; Tissot, P. *Implementation of a Zed 2i Stereo Camera for High-Frequency Shoreline Change and Coastal Elevation Monitoring*. International Geoscience and Remote Sensing Symposium (IGARSS), Pasadena, CA, USA, July 16-21. DOI: [10.1109/IGARSS52108.2023.10283203](https://doi.org/10.1109/IGARSS52108.2023.10283203).
- 2022 **Vicens-Miquel, M.**; Medrano, A.; Tissot, P.; Kamangir, H.; Starek, M. *Deep Learning Automatic Detection of the Wet/Dry Shoreline at Fish Pass, Texas*. 2022 International Geoscience and Remote Sensing Symposium (IGARSS), Kuala Lumpur, Malaysia, 17-22, 2022. DOI: [10.1109/IGARSS46834.2022.9884633](https://doi.org/10.1109/IGARSS46834.2022.9884633).
- 2018 Rahnemoonfar, M.; Robin, M.; **Vicens-Miquel, M.**; Dobbs, D.; Adams, A. *Flooded Area Detection from UAV Images Based on Densely Connected Recurrent Neural Networks*. International Geoscience and Remote Sensing Symposium (IGARSS), Valencia, Spain, July 22-27. DOI: [10.1109/IGARSS.2018.8517946](https://doi.org/10.1109/IGARSS.2018.8517946).

### CONFERENCE PRESENTATIONS AND INVITED TALKS

- 2024 **Vicens-Miquel, M.**; Tissot, P.; Medrano, A. *Performance and Comparison of Seq2Seq and Transformer Model Architectures for the Prediction of Water Levels from Hours to Days*. To be presented at the American Meteorological Society Annual Meeting, Baltimore, MD, USA, January 28-February 1.
- 2024 **Vicens-Miquel, M.**; Radin, C.; Nieves, V.; Tissot, P.; Medrano, A. *Empowering Coastal Resilience: A Multi-Layer Perceptron Approach for Subseasonal-to-Seasonal Sea Level Predictions in the Gulf of Mexico*. To be presented at the American Meteorological Society Annual Meeting, Baltimore, MD, USA, January 28-February 1.
- 2024 White, M.; **Vicens-Miquel, M.**; Marrero, H.; Tissot, P.; Woodall, C.; Duff, C.; Colburn B. *Uncertainty Quantification of the Onset and Offset of Cold-Stunning Events Using AI Ensemble Methods*. To be presented at the American Meteorological Society Annual Meeting, Baltimore, MD, USA, January 28-February 1.
- 2024 Colburn, K.; **Vicens-Miquel, M.**; Tissot, P. *The Use of Oblique Imagery and Ground Elevation Surveys to Generate a Time Series of Wet/Dry Shoreline*

- Elevations*. To be presented at the American Meteorological Society Annual Meeting, Baltimore, MD, USA, January 28-February 1.
- 2024 Ehrke, C.; Tissot, P.; **Vicens-Miquel, M.**; Estrada, B.; Mukai, K.; Glazer, B. *Estimation of Wave Height from Standard Deviation of Water Level Measured by a Low-Cost Water Level Sensor*. To be presented at the American Meteorological Society Annual Meeting, Baltimore, MD, USA, January 28-February 1.
- 2024 Woodall, J.; White, M.; Marrero, H.; **Vicens-Miquel, M.**; Tissot, P. *Exploring Cross-Validation Techniques for ML Predictions of Rare Cold-Stunning Events*. To be presented at the American Meteorological Society Annual Meeting, Baltimore, MD, USA, January 28-February 1.
- 2023 **Vicens-Miquel, M.**; Radin, C.; Nieves, V.; Tissot, P.; Medrano, A. *Advancing Coastal Inundation Frequency Predictions with an AI-based Sub-seasonal to Multi-year Water Level Model in the Gulf of Mexico*. To be presented at the AGU Fall Meeting 2023, San Francisco, CA, USA, December 11-15.
- 2023 **Vicens-Miquel, M.**; Tissot, P.; Medrano, A. *Deep Learning Architectures for Short-Term Water Level Predictions*. Oral presentation at the 2023 ASBPA National Coastal Conference, Provide, RI, USA, October 10-13.
- 2023 Tissot, P.; White, M.; **Vicens-Miquel, M.**; Kamangir, H.; Krell, E.; Kastl, M.; Estrada, B.; Colburn, K.; Stephenson, S.; Alonzo, J.; Flores, E.; Duff, C.; Woodall, J.; Marrero-Colominas, H.; DeSimone, A.; Beasley, A.; Nguyen, S.; King, S.; Medrano, A. *Coastal Artificial Intelligence and the AI2ES NSF AI Institute*. Oral presentation at the 2023 ASBPA National Coastal Conference, Provide, RI, USA, October 10-13.
- 2023 White, M.; Duff, C.; Marrero, H.; Woodall, J.; **Vicens-Miquel, M.**; Tissot, P. *AI Ensemble Predictions for cold-Stunning Events in the Shallow Laguna Madre, TX*. Oral presentation at the 2023 ASBPA National Coastal Conference, Provide, RI, USA, October 10-13.
- 2023 Pilartes-Congo, J.; Kastl, M.; Starek, M.; **Vicens-Miquel, M.**; Tissot, P. *Implementation of a Zed 2i Stereo Camera for High-Frequency Shoreline Change and Coastal Elevation Monitoring*. Poster presentation at the International Geoscience and Remote Sensing Symposium (IGARSS), Pasadena, CA, USA, July 16-21.
- 2023 **Vicens-Miquel, M.**; Tissot, P.; Medrano, A. *Physics-Based Deep Learning Architectures for Water Level Predictions*. Oral presentation at the American Association of Geographers Annual Meeting, Denver, CO, USA, March 23-27.
- 2023 **Vicens-Miquel, M.**; Tissot, P.; Medrano, A. *Artificial Intelligence for Coastal Inundation Predictions*. Oral presentation at the Coastal Bend Bays Foundation Coastal Issues Forum, Corpus Christi, TX, USA, March 6.
- 2023 White, M.; Tissot, P.; **Vicens-Miquel, M.**; Duff, C.; Marrero, H. *AI Ensemble Predictions for Cold Stunning Events in the Shallow Laguna Madre, TX*. Oral

- presentation at the Coastal Bend Bays Foundation Coastal Issues Forum, Corpus Christi, TX, USA, March 6.
- 2023 Pilartes-Congo, J.; Starek, M.; **Vicens-Miquel, M.**; Tissot, P. *Implementation of a ZED 2i Stereo Camera for Frequent and Localized Coastal Mapping*. Oral presentation at the 2023 ASPRS Annual Conference at Geo Week, Denver, CO, USA, February 13-15.
- 2023 **Vicens-Miquel, M.**; Medrano, A.; Tissot, P.; Kamangir, H. *Deep Learning Architectures for Water Level Predictions*. Oral presentation at the American Meteorological Society Annual Meeting, Denver, CO, USA, January 8-12.
- 2023 White, M.; Tissot, P.; **Vicens-Miquel, M.**; Hector, M.; Duff, C.; Woodall, J.; King, S.; Williams, J.; Colburn, B. *AI Ensemble Predictions for Cold Stunning Events in the Shallow Laguna Madre*. Poster presentation at the American Meteorological Society Annual Meeting, Denver, CO, USA, January 8-12.
- 2023 Kastl, M.; Mahlke, H.; Pilartes-Congo, J.; **Vicens-Miquel, M.**; Salazar, J.; Nguyen, S.; Tissot, P. *Pier Mounted Stereo Cameras to Measure Time Series of Total Water Levels*. Poster presentation at the American Meteorological Society Annual Meeting, Denver, CO, USA, January 8-12.
- 2023 Duff, C.; Woodall, J.; Tissot, P.; White, M.; **Vicens-Miquel, M.** *Long Short-Term Memory Predictions of Water Temperature for Cold Stunning Events*. Poster presentation at the American Meteorological Society Annual Meeting, Denver, CO, USA, January 8-12.
- 2023 Marines, A.; Ramirez, D.; **Vicens-Miquel, M.**; Tissot, P. *Comparison of Machine Learning Models for Prediction of Water Level at Tide Gauge*. Poster presentation at the American Meteorological Society Annual Meeting, Denver, CO, USA, January 8-12.
- 2023 Millien, J.; Edwards, D.; Colburn, K.; **Vicens-Miquel, M.**; Pilartes-Congo, J.; Stephenson, S.; Tissot, P. *Change Analysis of Time Series of Beach Digital Elevation Models and Shoreline Wet/Dry Lines*. Poster presentation at the American Meteorological Society Annual Meeting, Denver, CO, USA, January 8-12.
- 2023 Colburn, K.; Tissot, P., **Vicens-Miquel, M.** *Comparison of Human Delineated Ocean Beach Wet/Dry Shorelines with AI Predictions*. Poster presentation at the American Meteorological Society Annual Meeting, Denver, CO, USA, January 8-12.
- 2023 Pilartes-Congo, J.; **Vicens-Miquel, M.**; Starek, M.; Tissot, P. *Application of Close-Range Stereophotogrammetry for Predicting Coastal Inundation*. Poster presentation at the American Meteorological Society Annual Meeting, Denver, CO, USA, January 8-12.
- 2022 **Vicens-Miquel, M.**; Medrano, A.; Tissot, P.; Kamangir, H.; Starek, M. *Generalized Model for Wet/Dry Shoreline Detection and Total Water Level Elevation Using Deep Learning*. Poster presentation at the AGU Fall Meeting 2022, Chicago, IL, USA, December 12-16.

- 2022 Pilartes-Congo, J.; **Vicens-Miquel, M.**; Garcia, I.; Starek, M.; Tissot, P. *Examining Different Photogrammetry and LiDAR Methodologies for Monitoring Coastal Elevation and Shoreline Changes*. Poster presentation at the AGU Fall Meeting 2022, Chicago, IL, USA, December 12-16.
- 2022 **Vicens-Miquel, M.**; Tissot, P.; Medrano, A. *Deep Learning Architectures to Improve Coastal Water Level Predictions*. Oral presentation at the 2022 ASBPA National Coastal Conference, Long Beach, CA, USA, September 13-16.
- 2022 **Vicens-Miquel, M.**; Medrano, A.; Tissot, P.; Kamangir, H.; Starek, M. *Generalized Model for Wet/Dry Shoreline Detection Using Deep Learning*. Poster presentation at the 2022 ASBPA National Coastal Conference, Long Beach, CA, USA, September 13-16.
- 2022 Pilartes-Congo, J.; **Vicens-Miquel, M.**; Kastl, M.; Starek, M.; Tissot, P. *Monitoring Changes in Shoreline and Coastal Elevation Using a ZED 2i Stereo Camera*. Poster presentation at the 2022 ASBPA National Coastal Conference, Long Beach, CA, USA, September 13-16.
- 2022 **Vicens-Miquel, M.**; Medrano, A.; Tissot, P.; Kamangir, H.; Starek, M. *Deep Learning Automatic Detection of the Wet/Dry Shoreline at Fish Pass, Texas*. Oral presentation at the 2022 IEEE International Geoscience and Remote Sensing Symposium (IGARSS), Kuala Lumpur, Malaysia, July 17-22.
- 2022 **Vicens-Miquel, M.**; Medrano, A.; Tissot, P.; Kamangir, H.; Starek, M. *Deep Learning Generalized Model for Wet/Dry Shoreline Detection*. Oral presentation at the 2022 Texas Coastal Symposium, Corpus Christi, TX, USA, April 14.
- 2022 **Vicens-Miquel, M.**; Medrano, A.; Tissot, P.; Kamangir, H.; Starek, M. *Georeferenced AI Wet/Dry Shoreline Detection using UAV Imagery*. Oral presentation at the ESRI Imagery and Remote Sensing Summit, Virtual, March 31.
- 2022 **Vicens-Miquel, M.**; Medrano, A.; Tissot, P.; Kamangir, H.; Starek, M. *Automated Wet/Dry Shoreline Delineation Using Deep Learning. GeoAI and CyberGIS for Advancing Spatial Decision Making*. Oral presentation at the American Association of Geographers Annual Meeting, New York, NY, USA, February 25 – March 1.
- 2022 **Vicens-Miquel, M.**; Medrano, A.; Tissot, P.; Kamangir, H.; Starek, M. *Deep Learning Wet/Dry Shoreline Detection Using UAV Imagery*. Oral presentation at the American Meteorological Society Annual Meeting, Houston, TX, USA, January 23-27.
- 2021 **Vicens-Miquel, M.**; Medrano, A.; Tissot, P.; Kamangir, H.; Starek, M. *Wet/Dry Shoreline Detection Using Deep Learning*. Oral presentation at the 2021 ASBPA National Coastal Conference, New Orleans, LA, USA, September 28 – October 1.

2018                   Rahnemoonfar, M.; Robin, M.; **Vicens-Miquel, M.**; Dobbs, D.; Adams, A.  
*Flooded Area Detection from UAV Images Based on Densely Connected  
Recurrent Neural Networks*. Oral presentation at the 2018 IEEE International  
Geoscience and Remote Sensing Symposium (IGARSS), Valencia, Spain,  
July 22-27.

## **HONORS AND AWARDS**

2022 – 2023           TAMUCC International Presidential Graduate Research Scholarship (\$4,000)  
2022 – 2023           TAMUCC College of S&E Graduate Research Scholarship (\$1,000)  
2022 – 2023           TAMUCC College of Engineering Graduate Research Scholarship  
(\$1,041.67)  
2022 – 2023           TAMUCC Geospatial Engineering Graduate Research Scholarship (\$500)  
2023                   **Co-Author for American Meteorological Society Artificial Intelligence  
Conference Poster Winner (\$300)**  
2022                   **American Geophysical Union Outstanding Student Presentation Award  
(OSPA) recipient (\$250)**  
2021 – 2022           TAMUCC International Presidential Graduate Research Scholarship (\$4,000)  
2021 – 2022           TAMUCC College of S&E Graduate Research Scholarship (\$2,000)  
2021 – 2022           TAMUCC Geospatial Engineering Graduate Research Scholarship (\$600)  
2020 – 2021           TAMUCC International Presidential Graduate Research Scholarship (\$3,141)  
2020 – 2021           TAMUCC College of S&E Graduate Research Scholarship (\$1,000)  
2020 – 2021           TAMUCC Division of Research and Innovation Student Research  
Competition Award (\$800)  
2020 – 2021           TAMUCC Geospatial Engineering Graduate Research Scholarship (\$1,000)  
2019 – 2020           Athletic Department 5<sup>th</sup> Year Scholarship (\$10,312.49)  
2019 – 2020           Ruth A. Campbell School Endowed Scholarship (\$500)  
2019 – 2020           Evening Post Pub Co.–KRIS TV Scholarship (\$500)  
2019 – 2020           Exxon USA Found Scholarship (\$500)  
2018 – 2019           M Collins UG Scholarship (\$8,400)  
2017, 2018           NCAA Division I Tennis two-time first team All-Conference in singles  
(Southland Conference)  
2015 – 2020           6-time Dean’s List Recipient  
2015 – 2020           8-time Athletic Department Academic Roll Recognition  
2015 – 2018           3-time Scholar Student-Athlete

## REFERENCES

Dr. Philippe E. Tissot  
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