Amandine Gamble | PhD, DMV | Disease ecology

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French & Australian nationalities

Research experiences

2019-2021 **Cross-scale modelling of epidemiological dynamics in multihost systems**
Post-doctoral researcher – Lloyd-Smith Lab, University of California Los Angeles, USA

2018-2019
4 months **Large gulls as sentinels to track infectious agent circulation**
Post-doctoral researcher – CEFE (CNRS-University of Montpellier), France – Main collaborators: C.E. Hebert (Environment and Climate Change Canada) & T. Boulinier (CEFE)

2015-2018
36 months **Ecology of infectious agent circulation in colonial birds: inference using serological approaches**
PhD student in Eco-epidemiology – French Ministry of Research fellowship – CEFE (CNRS-University of Montpellier), France – Supervisor: T. Boulinier (CEFE)

2015
5 months Impact of the nutritional state after a prolonged fast on the foraging trip efficiency in king penguins (*Aptenodytes patagonicus*)
MSc and Veterinary Medicine theses – IPHC, Strasbourg, France – Supervisors: Y. Handrich & J.-P. Robin (IPHC)

Academic qualifications

2018 **PhD in Eco-epidemiology** – University of Montpellier, France

2016 **Doctor of Veterinary Medicine** – ENV Alfort, France
Erasmus exchange program – School of Veterinary Science, University of Liverpool, UK

2015 **MSc in Ecophysiology and Animal Behaviour** – University of Strasbourg, France

Research visits

April 2018 – Lloyd-Smith Lab, University of California Los Angeles, USA – Understanding avian cholera dynamics in an albatross colony: integrating multiple sources of individual data [Developed skill: data integration using Bayesian modelling]

Skills

Modelling and data analysis **Data simulation** using R and MATLAB · Frequentist statistics including mixed-effect modelling using R · **Capture-recapture modelling** using E-SURGE, R and MARK · **Occupancy modelling** using R and PRESENCE · Basic **integrated modelling** using R and JAGS · **Tracking data** analysis using R

Fieldwork **Isolated sites** · Capture and handling of birds (main experience with procellariiforms, penguins, gulls and skuas, adults and nestlings) · Bird ringing, resighting and breeding monitoring as part of **long term capture-recapture programs** · **Blood sampling** (birds and mammals) · **Logger deployment** (GPS-UHF) · Necropsy · **Electronic notebook** implementation on Android using CyberTracker

Main field campaigns

- Southern Indian Ocean (French Polar Institute program IPEV 1151 Ecopath): Kerguelen Islands (2 months, 2018), Crozet Islands (2 months, 2017) and Amsterdam Island (2 months, 2016)
- Falkland/Malvinas Islands (1 month, 2018; 1 month, 2019)
- Barents Sea (French Polar Institute program IPEV 333 Parasito-Arctic): Hornøya (7 weeks, 2016; 6 weeks, 2017)

Laboratory Immunoassays, basic field microbiology

Languages French (native)· English (fluent)

ACTIVITIES WITHIN THE SCIENTIFIC COMMUNITY

STUDENT AND RESEARCH ASSISTANT SUPERVISION

- Aubrey Butler & Hubert Tang (undergrad students, UCLA, 2020) – Mapping henipavirus-induced syncytium formation *in vivo* (literature review)
- Jessica Kasamoto & Natashia Benjamin (Bruins in Genomics Summer program, UCLA, 2019) – Using mathematical models to investigate the infection dynamics of henipaviruses in cell culture (modelling study) – *Best poster award* of the Bruins in Genomics Summer program 2019
- Augustin Clessin (gap year, ENS Lyon, 2018-2020) – Assessing the costs and benefits of different management strategies in an epidemiological context: the case of avian cholera on Amsterdam Island (modelling study)
- Romain Bazire (Master 1, Ecology and biodiversity management, University of Montpellier, 2016) – Brown skua movements and avian cholera circulation on Amsterdam Island (data analysis study)
- Supervision of multiple overwintering field assistants on Amsterdam Island (Southern Indian Ocean) since 2016
- Supervision of multiple field assistants on Hornøya (Barents Sea) and on the Mediterranean coasts since 2017

TEACHING BSc courses of descriptive statistics (120 hours) and integrative biology (10 hours), 2016-2017 & 2017-2018, University of Montpellier, France

PEER-REVIEW J. Anim. Ecol. (1), Epidemiol. Infect. (1), J. Wildl. Dis. (1), Mar. Ecol. Prog. Ser. (1), Comp. Biochem. Phys. D (2), PLOS ONE (5), MethodsX (1), Math. Biosci. Eng. (2), Int. J. Environ. Res. Public Health (2), Ann. Intern. Med. (1)

WORKSHOP & SYMPOSIUM ORGANISATION

- *Upcoming, co-organiser*. The ecology of host-parasite interactions in seabirds: Combining approaches to understand eco-epidemiological dynamics and inform conservation decisions, 2021, Hobart, Australia – T. Boulinier, S. Burthe, A. Gamble
- *Co-organiser*. Polar wildlife: connecting ecology, health and disease issues in a changing world, 2018, Davos, Switzerland – T. Boulinier, S. Kutz, A. Barboda & M. Dewar – *Invited talk.* Disease of albatrosses on Amsterdam island: the interest of combining approaches

AWARDS AND GRANTS

2020
- *BES Small Research Grant* for the project "Circulation of infectious agents in the world population of an endangered penguin and implications for conservation" – £5 000

2019
- *Dissertation prize* from the Doctoral College of Montpellier University (ranked first in the field of Ecology in 2019 by the Shanghai Ranking) for the PhD thesis "Ecology of infectious agent circulation in colonial birds: inference using serological approaches". Three dissertations were awarded, including only one in the field of Biodiversity, Agriculture, Food, Environment, Earth and Water (GAIA Doctoral School)

2018
- *Shackleton Grant* and *The Explorer Club Exploration Fund Grant* for the 2019 fieldwork campaign in the Falkland Islands as part of the project "Infectious diseases as a threat to wildlife in the Southern Ocean" – £5 000 and $1 200
- *IDEAS (NSF RCN) workshop participation grant* for the *Immunity across scales* workshop, Glasgow, UK – $503
- *IDEAS (NSF RCN) Exchange Grant* and *LabEx CeMEB Immersion Grant* for the research visit at the Lloyd-Smith Lab, University of California Los Angeles, as part of the project "Understanding avian cholera dynamics in an albatross colony: integrating multiple sources of individual data" – $3 320 and 445€
- *IASC Travel Grant* to participate in the POLAR 2018 meeting, Davos – 600€
- *BES Training & Travel Grant* to participate in the EEID meeting, Glasgow – £450

2017 · *Falkland Islands Government Environmental Studies Budget* for the 2018 fieldwork campaign in the Falkland Islands as part of the project "Infectious diseases as a threat to seabirds on New Island" – £4 000

2016 · *Silver medal from the French Veterinary Academy* for the veterinary thesis "Impact of the nutritional state after a prolonged fast on the foraging trip efficiency in king penguins"

2015 · *GAIA Doctoral School Scholarship*, French Ministry of Research / University of Montpellier – Fully funded 3 year PhD, 90 000€

2013 · *Bourse aux Idées Mérial* for the project "Impact of captivity and human handling on the stress level of bobtail lizards" – 1 000€

SCIENTIFIC COMMUNICATION

PEER-REVIEWED PUBLICATIONS

· 10. Fischer R.*, Morris D.H.*, van Doremalen N., Sarchette S., Matson J., Bushmaker T., Yinda C.K., Seifert S., **Gamble A.**, Williamson B., Judson S., de Wit E., Lloyd-Smith, J. & Munster, V. (2020). Assessment of N95 respirator decontamination and re-use for SARS-CoV-2. ***Emerging Infectious Diseases***, in press. Preprint available on *medRxiv* 10.1101/2020.04.11.20062018 (*: equal contribution)

· 9. Jaeger A.*, **Gamble A.***, Lagadec E.*, Lebarbenchon C., Bourret V., Tornos J., Barbraud C., Delord K., Weimerskirch H., Thiebot J.-B., Boulinier T. & Tortosa P (2020). Exploring the transmission dynamics of a bacterial pathogen on a remote oceanic island reveals annual epizootics impacting an albatross population. ***EcoHealth***, in press. Preprint available on *BioRxiv*, 10.1101/711283 (*: equal contribution)

· 8. van Doremalen N.*, Bushmaker T.*, Morris D.H.*, Holbrook M.G., **Gamble A.**, Williamson B.N., Tamin A., Harcourt J.L., Thornburg N.J., Gerber S.I., Lloyd-Smith J.O., de Wit E. & Munster V.J. (2020). Aerosol and surface stability of SARS-CoV-2 as compared with SARS-CoV-1. ***New England Journal of Medicine*** 382, 1564-1567 (*: equal contribution)

· 7. **Gamble A.**, Bazire R., Delord K., Barbraud C., Jaeger A., Gantelet H., Thibault E., Lebarbenchon C., Lagadec E., Tortosa P., Weimerskirch H., Thiebot J.-B., Garnier R., Tornos J. & Boulinier T. (2019). Movements of an apex consumer among and within endangered seabird colonies: opportunities for pathogen spread. ***Journal of Applied Ecology*** 57, 367-378

· 6. **Gamble A.**, Garnier R., Chambert T. Gimenez O. & Boulinier T. (2019). Next-generation serology: integrating cross-sectional and capture-recapture approaches to infer disease dynamics. ***Ecology*** 101, e02923

· 5. Sanz-Aguilar A., Payo-Payo A., Rotger A., Moutailler S., Igual J. M., Miranda M. A., Torres M., Picorelli V., **Gamble A**. & Boulinier T. (2019). Infestation of small seabirds by *Ornithodorus maritimus* ticks: effects on chick body condition, reproduction and associated infectious agents. ***Tick and Tick-borne Diseases*** 11, 101281

· 4. **Gamble A.**, Garnier R., Jaeger A., Thibault E., Gantelet H., Tortosa P., Bourret V., Thiebot J.-B., Delord K., Weimerskirch H., Tornos J., Barbraud C. & Boulinier T. (2019). Exposure of albatrosses to the avian cholera agent leads to a short-lived immune response: implications for disease surveillance and management. ***Oecologia*** 189, 939-949

· 3. **Gamble A.**, Ramos R., Parra-Torres Y., Mercier A., Galal L., Pearce-Duvet J.M.C., Villena I., Montalvo T., Gonzalez-Solis J., Hammouda A., Oro D., Selmi S. & Boulinier T. (2019). Exposure of yellow-legged gulls to *Toxoplasma gondii* along the Western Mediterranean coasts: tales from a sentinel. ***International Journal for Parasitology: Parasites & Wildlife*** 8, 221-228

· 2. Bourret V., **Gamble A.**, Tornos J., Jaeger A., Delord K., Barbraud C., Tortosa P., Kada S., Thiebot J.-B., Thibault E., Gantelet H., Weimerskirch H., Garnier R. & Boulinier T. (2018). Vaccination protects endangered albatross chicks against avian cholera. ***Conservation Letters*** 11, e12443

· 1. Boulinier T., Kada S., Ponchon A., Dupraz M., Dietrich M., **Gamble A.**, Bourret V., Duriez O., Bazire R., Tornos J., Tveraa T., Chambert T., Garnier R. & McCoy K. D. (2016). Migration, prospecting, dispersal? What host movement matters for infectious agent circulation? ***Integrative and Comparative Biology*** 56, 330-342

ILLUSTRATIVE NOTES

- *Photo gallery*. **Gamble A.**, Garnier R., Chambert T. Gimenez O. & Boulinier T. (2020). Next-generation serology: integrating cross-sectional and capture-recapture approaches to infer disease dynamics. ***The Bulletin of the Ecological Society of America*** 101, e01670
- *Photo gallery*. **Gamble A.**, Weimerskirch H. & Boulinier T. (2019) Seabirds blinded by ticks. ***Frontiers in Ecology and the Environment***, in press

PREPRINTS

- Borremans B., **Gamble A.**, Prager K., Helman S.K., McClain A.M., Cox C., Savage V. & Lloyd-Smith J.O. (2020). Quantifying antibody kinetics and RNA shedding during early-phase SARS-CoV-2 infection. Preprint available on *Open Science Framework* 10.31219/osf.io/evy4q
- **Gamble A.**, Fischer R., Morris D.H., Yinda K. C., Munster V. & Lloyd-Smith J.O. (2020). Heat-treated virus inactivation rate depends strongly on treatment procedure. Preprint available on *bioRxiv*

CONFERENCE PRESENTATIONS

- *Twitter presentation.* Gamble. (2020). Migration, foraging, prospecting, dispersal... What host movement matters for infectious agent circulation? ***6th World Seabird Twitter Conference***, 4-6 May
- *Poster.* Gamble et al. (2019). Next Generation Serology: integrating cross-sectional and capture-recapture approaches to infer disease dynamics. ***68th WDA conference***, 4-9 August, Tahoe, CA, USA
- *Poster.* Gamble et al. (2019). Integrating data across scales to model the within-host dynamics of emerging viruses. ***EEID meeting***, 10-13 June, Princeton, NJ, USA
- *Talk.* Gamble et al. (2018). Circulation of avian cholera among endangered seabirds: the predating and scavenging brown skua as an epidemiological bridge on Amsterdam Island? ***Seabird Group Conference***, 3-6 September, Liverpool, UK
- *Talk.* Gamble et al. (2018). Diseases threatening polar seabirds: from immune-ecology to conservation. ***POLAR 2018***, 19-23 June, Davos, Switzerland
- *Poster.* Gamble et al. (2018). Combining approaches to understand avian cholera dynamics in seabirds: implications for conservation. ***EEID meeting***, 29 May-1 June, Glasgow, UK
- *Poster.* Gamble et al. (2017). Optimization of sampling designs in eco-epidemiologic studies based on the detection of antibodies in colonial vertebrates. ***Ecological Research Network & LTER-France joint conference***, 2-4 October, Nantes, France
- *Talk.* Gamble et al. (2017). Dynamics of antibody levels against avian cholera after natural exposure and vaccination in albatrosses: disease ecology implications. ***REID Immuno-écologie group meeting***, 14-15 September, Montpellier, France
- *Talk.* Gamble et al. (2017). "Next Generation Serology": integrating cross-sectional and capture-recapture data to infer disease dynamics from serological data. ***REID Immuno-écologie group meeting***, 14-15 September, Montpellier, France
- *Invited talk*. Gamble et al. (2017). Opportunistic feeders as sentinels for the circulation of infectious agents in spatial contexts. ***Waterbird Society annual meeting***, 8-12 August, Reykjavik, Iceland
- *Poster.* Gamble et al. (2017). Optimization of sampling designs in eco-epidemiologic studies based on the detection of antibodies in colonial vertebrates. ***EURING analytical meeting***, 3-7 July, Barcelona, Spain
- *Talk.* Gamble et al. (2017). Optimization of sampling designs in eco-epidemiological studies based on antibody detection in sentinel species: the case of large gulls. ***4th Young Natural History scientists' meeting***, 7-11 February, Paris, France
- *Talk.* Gamble et al. (2016). Exposure of yellow-legged gulls to *Toxoplasma gondii* along the Western Mediterranean coasts: tales from a sentinel. ***Sfécologie***, 24-28 September, Marseille, France
- *Talk.* Gamble et al. (2016). Serological data as a tool for studying co-infections patterns: example of *Borrelia burgdorferi* sl and flaviviruses in a seabird colony. ***REID Tiques et Maladies à Tiques group meeting***, 9-11 March, Sète, France
- *Poster.* Gamble et al. (2015). Influence de l'état nutritionnel après un jeûne prolongé sur l'efficacité du voyage alimentaire chez le manchot royal. ***2nd Colloque d'ÉcoPhysiologie Animale***, 4-6 November, La Rochelle, France

Invited seminars, lectures and lab meetings

- *Invited lecture.* Gamble. (2019). Using serology to infer eco-epidemiological processes in wild populations. ***Montana State University***, 26 November, Bozeman, MT, USA
- *Invited seminar.* Gamble. (2019). Linking data across scales to identify determinants of viral fitness and pathogenicity: benefits, challenges and solutions. ***Rocky Mountain Laboratories***, 21 November, Hamilton, MT, USA
- *Invited video lab meeting.* Gamble. (2018). Ecology of infectious agent circulation in colonial birds: inference using serological approaches. ***Mordecai Lab, Stanford University***, 30 October, Sanford, CA, USA
- *Invited seminar.* Gamble. (2018). Combining approaches to understand avian cholera dynamics in an albatross colony. ***Fish, Wildlife, and Conservation Biology Department, Colorado State University***, 10 May, Fort Collins, CO, USA
- *Invited seminar.* Gamble. (2018). Combining experimental and simulation-based approaches to manage avian cholera dynamics in albatross colonies. ***National Wildlife Research Center, United States Department of Agriculture***, 7 May, Fort Collins, CO, USA
- *Invited lab meeting.* Gamble. (2018). Ecology of infectious agent circulation in colonial birds: inference using serological approaches. ***Lloyd-Smith Lab, University of California Los Angeles***, 24 April, Los Angeles, CA, USA
- *Invited seminar.* Gamble et al. (2018). Infectious diseases in albatrosses: from basic immuno-ecology to perspectives for conservation. ***SAERI***, 22 January, Stanley, Falkland/Malvinas Islands

Outreach

Invited scientific blog posts and newspaper articles

- *Blog post.* **Gamble A.** (2020). Predator and scavenger movements as opportunities for pathogen spread among endangered seabirds. ***The Applied Ecologist's Blog*** (official blog for Journal of Applied Ecology). 21 January [Summary of Gamble et al. 2019, Journal of Applied Ecology]. French translation also available
- *Blog post.* **Gamble A.** (2020). Tracking predator and scavenger movements to understand pathogen spread among endangered seabirds. ***Blog of the Zone Atelier Antarctique LTSER***. 9 January [Summary of Gamble et al. 2019, Journal of Applied Ecology].
- *Newspaper article.* **Gamble A.** (2018). Investigating the cause of seabird deaths on New Island. ***Penguin News***, 10 August, 9

Public talk

- **Gamble A.** & Boulinier T. (2019). Infectious diseases in seabirds: from basic eco-immunology to conservation. 4 February, ***Falkland Islands Chamber of Commerce***, Stanley, Falkland/Malvinas Islands

Media coverage and interviews

> 10 interviews for media coverage of studied I contributed to, leading to articles (e.g., *The New York Times, abc10, Sciences et Avenir, Science et Vie, Hakai Magazine*) and TV emissions (e.g., *Complément d'Enquête*)

References

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